



GRADUATE CATALOG

2023-2024

Tennessee Technological University
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Cookeville, TN 38505
931-372-3233
gradstudies@tntech.edu
www.tntech.edu/graduatestudies

Contents

Catalog Home.....	3
Notice	3
Message from the President	4
Information Directory	5
Accreditation and Memberships.....	6
University Calendar	7
General University Information	8
Statement of Mission	8
Vision Statement.....	9
The University Campus	9
Research Opportunities	9
Centers of Excellence	10
Student Support Services.....	12
Administration and Faculty	15
Tennessee Tech Board of Trustees	15
Academic and Administrative Officers	15
Administrative Staff.....	16
Presidents of the University	16
Organization of the College of Graduate Studies	17
Graduate Studies Executive Committee.....	17
Graduate Faculty	18
Graduate Assistants	21
Admission to the College of Graduate Studies	25
General University Graduate Admissions Requirements.....	25
International Students	26
Resident Alien	27
Admission Classifications	27
Special Admissions	28

Resident Classification	30
Fees and Expenses	30
Registration and Enrollment Requirements.....	30
Inclement Weather Policy.....	30
Graduate Courses	31
Grading	32
Grading System	32
Quality Points.....	32
Quality Point Average	32
Grade of I (Incomplete).....	33
Quality of Work.....	33
Permissible Loads	35
Definition of Credit Hour	36
Change of Major	36
Course Repetition Policy	36
University Policies	36
Graduate Academic Fresh Start	41
Student Complaint Procedures.....	42
Degree Requirements	42
General Degree Requirements	42
Master's Degree General Requirements.....	44
Specialist in Education Degree General Requirements.....	47
Doctor of Philosophy Degree General Requirements.....	49
College of Engineering - Master of Science Degree Requirements	51
College of Engineering - Doctor of Philosophy Degree Requirements	52
College of Agriculture and Human Ecology	54
School of Agriculture.....	54
School of Human Ecology	54

College of Arts and Sciences	56	Department of Computer Science	169
Department of Biology	56	Department of Electrical and Computer Engineering.....	172
Department of Chemistry	59	Department of General and Basic Engineering.....	175
Department of Earth Sciences	61	Department of Mechanical Engineering ..	176
Department of English	61	Department of Manufacturing and Engineering Technology Information	178
Department of Foreign Languages.....	72	College of Fine Arts	179
Department of Mathematics	72	College of Interdisciplinary Studies	179
Department of Physics	77	Doctor of Philosophy.....	181
Department of Sociology and Political Science	77	Master of Professional Studies.....	187
College of Business.....	78	Certificate	198
College of Education.....	91	Professional Science Master's	204
Department of Counseling and Psychology	92	Certificate	207
Department of Curriculum and Instruction	107	Whitson-Hester School of Nursing	209
Department of Exercise Science, Physical Education, and Wellness	146	Master of Science in Nursing	212
Department of Instructional Leadership ..	153	Doctor of Nursing Practice	221
Department of Learning Design and Technology.....	156	MSN Post-Master's Nursing Certificate Program	236
Certificate	157	Cooperative Education	239
College of Engineering.....	160	Course Descriptions	242
Department of Chemical Engineering.....	164		
Department of Civil and Environmental Engineering.....	166		

Catalog Home

June 2023

The Graduate Catalog is only available online and covers the entire academic year. The next publication will take place in June 2024 for 2024-2025

Search options are available on the left-hand side of the page.

Change of Catalog Content

The course offerings and requirements of the institution are continually under examination and revision. This catalog is not intended to state contractual terms and does not constitute a contract between the student and the institution.

The institution reserves the right to make changes as required in course offerings, curricula, academic policies, and other rules and regulations affecting students to be effective whenever determined by the institution. These changes will govern current and formerly enrolled students. Enrollment of all students is subject to these conditions.

If you have questions or comments, please contact Graduate Studies at gradstudies@tnitech.edu.

Notice

The course offerings and requirements of the institution are continually under examination and revision. This catalog (bulletin) presents the offerings and requirements in effect at the time of publication but is no guarantee that they will not be changed or revoked. However, adequate, and reasonable notice will be given to students affected by any changes. This catalog (bulletin) is not intended to state contractual terms and does not constitute a contract between the student and the institution.

The institution reserves the right to make changes as required in course offerings, curricula, academic policies, and other rules and regulations affecting students to be effective whenever determined by the institution. These changes will govern current and formerly enrolled students. Enrollment of all students is subject to these conditions.

Current information may be obtained from the following sources:

- Admission Requirements – College of Graduate Studies
- Course Offerings – Department or Division Offering Course
- Degree Requirements – Departmental Chairperson of Major
- Fees and Tuition – Business Office

The University provides the opportunity for students to increase their knowledge by providing programs of instruction in the various disciplines and programs through faculty who, in the opinion of the University, are qualified for teaching at the college level. The acquisition and retention of knowledge by any student is, however, contingent upon the student's desire and ability to learn and his or her application of appropriate study techniques to any course or program. Thus, the University must necessarily limit representation of student preparedness in any field of study to that competency demonstrated at that specific point in time at which appropriate academic measurements were taken to certify course or program completion. Any or all students may be required to take one (1) or more tests designed to measure general education achievement and/or achievement in selected major areas as a prerequisite to graduation for the purpose of valuation of academic programs. Unless otherwise provided for any individual program, no minimum score or level of achievement is required for graduation. Participation in testing and other evaluation measures are required for all students and for students in selected programs. In order to comply fully with this provision, the student must authorize the release of his or her scores to the institution. Individual student scores will be treated as confidential.

Tennessee Technological University is an Equal Opportunity/Affirmative Action institution and is in compliance with Titles VI and VII of the Civil Rights Act of 1974, Title IX of the Education Amendments of 1972, the Age Discrimination

Act of 1974, the Rehabilitation Act of 1973, the Vietnam Era Veterans Readjustment Act of 1974, and the Americans with Disabilities Act of 1990. The University is nondiscriminatory on the basis of age, race, color, religion, sex, national origin, disability status, or status as a disabled veteran or veteran of the Vietnam era. Inquiries or complaints concerning these policies should be directed to the Affirmative Action Officer, Derryberry Hall, Room 314D, (931) 372-3016.

Faculty members will endeavor to make necessary accommodations for disabled persons in their courses. The Office of Disability Services is available to assist the faculty to make necessary special arrangements for disabled students. This Office should be contacted as early as possible by a student regarding assistance that may be needed for attendance at the University.

Message from the President

Dear Student,

Congratulations and welcome to Tennessee Technological University. As a graduate student, we offer you a place to focus on relevant work, to fearlessly pursue answers to problems that have global implications, and to diligently dedicate yourself to creating knowledge.

Universities ultimately exist to create and transfer knowledge and to identify and develop human talent. During your personal experience here, you can expect that we will offer you the tools and environment you need to succeed.

We strive to incorporate the latest technology throughout all disciplines. As our university focuses on the national priorities of science, technology, engineering, and mathematics, we strengthen all our programs by infusing technological innovation across campus.

TTU is also staying responsive to the needs of industry and to society. You will work with researchers, scholars, and mentors here who maintain relationships with key industrial, government and community leaders.

You have joined the company of an esteemed group – those who have chosen TTU to prepare them for success in their careers and in their life experiences. Our alumni hold positions as Fortune 500 CEOs, NASA astronauts, government leaders, renowned professors, respected researchers and other prestigious leaders.

You will make a positive impact here. Congratulations for choosing to become an important part of Tennessee Tech University.

Sincerely,

Philip B. Oldham

President

Information Directory

All inquiries and correspondence concerning the following areas should be addressed to:

Graduate Studies

College of Graduate Studies
Tennessee Technological University
Box 5012
Cookeville, TN 38505-0001
Ph: (931) 372-3233
Fx: (931) 372-3497
Gradstudies@tntech.edu

Financial Aid

Office of Financial Aid
Tennessee Technological University
Box 5076
Cookeville, TN 38505-0001
Ph: (931) 372-3073 or 1-800-268-0236
Fx: (931) 372-6309
financialaid@tntech.edu

Records and Registration

Office of Records and Registration
Tennessee Technological University
Box 5026
Cookeville, TN 38505-0001
Phone: (931) 372-3317 or 1-800-268-0242
email: records@tntech.edu

Records and Registration

Office of Records and Registration
Box 5026
Cookeville, TN 38505-0001
Ph: (931) 372-3317 or 1-800-268-0242
Fx: (931) 372-6111
records@tntech.edu

Academic Offices

College of Graduate Studies, Office of the Dean	(931) 372-3233
College of Agriculture & Human Ecology	(931) 372-3149
College of Arts & Sciences	(931) 372-3118
College of Business	(931) 372-3372
College of Education	(931) 372-3124
College of Engineering	(931) 372-3172
College of Interdisciplinary Studies	(931) 372-3394

Whitson-Hester School of Nursing (931) 372-3203

International Education (931) 372-3634

Provost and Vice-President for Academic Affairs (931) 372-3224

Directory assistance for other offices is available through the main switchboard at (931) 372-3101. The University's web site address is **www.tntech.edu**.

Tennessee Technological University was founded in 1915 and is governed by our Board of Trustees. www.tntech.edu/board

TTU /An EEO/AA/Title IX/Section 504/ADA Employer

Accreditation and Memberships

Tennessee Technological University—A State University

Tennessee Tech University is accredited by the Southern Association of Colleges and Schools Commission on Colleges (SACSCOC) to award baccalaureate, master's, specialist, and doctoral degrees. Tennessee Tech University also may offer credentials such as certificates and diplomas at approved degree levels. Questions about the accreditation of Tennessee Tech University may be directed in writing to the Southern Association of Colleges and Schools Commission on Colleges at 1866 Southern Lane, Decatur, GA 30033-4097, by calling (404) 679-4500, or by using information available on SACSCOC's website (www.sacscoc.org).

Accreditation

- AACSB--International - The Association to Advance Collegiate Schools of Business
- AAFCS - American Association of Family and Consumer Sciences
- ABET - Accreditation Board for Engineering and Technology
- ACS - The American Chemical Society
- ACEND - Accreditation Council for Education in Nutrition and Dietetics
- CACREP - Council for the Accreditation of Counseling and Related Educational Programs
- CAEP - Council for the Accreditation of Educator Preparation
- CCNE - Commission on Collegiate Nursing Education
- NASAD - National Association of Schools of Art and Design
- NASM - National Association of Schools of Music

Memberships

- American Association of Colleges of Teacher Education
- American Association of State Colleges and Universities
- Council of Graduate Schools
- Ohio Valley Conference
- Oak Ridge Associated Universities
- Putnam County Chamber of Commerce
- Southern Association of Colleges and Schools Commission on Colleges (SACSCOC)
- Teacher Education Council of State Colleges and Universities
- Tennessee College Association

University Calendar

Please see the University Calendar web site at <https://www.tntech.edu/calendar/> for registration, fee payment, drop/add, and other important dates. For detailed listing of dates specific to graduate students go to <https://www.tntech.edu/graduatestudies/gcalendar.php>.

Summer Semester 2023

April 3 - May 19	Registration for Summer 2023
May 22	Classes begin for First and Full Term
May 29	Memorial Day Holiday
May 24	Last Day to Add a 1st Term Summer Course
May 28	Last Day to Add Full Term Course
June 13	Last Day to Drop 1st Term Course
June 23	Final Examinations for First Term
June 24	Last Day to Withdraw (1st Term)
June 26	Classes begin for Second Term
June 28	Last Day to Add 2nd Term Course
July 4	Independence Day Holiday
July 7	Last Day to Drop Full Term Course
July 18	Last Day to Drop 2nd Term Course
July 26	Last Day to Withdraw (Full & 2nd Terms)
July 27-28	Final Examinations for Second and Full Term

Fall Semester 2023

April 4 - August 17	Registration for Fall 2023
August 17	Classes begin
August 30	Last Day to Add or Drop Classes in Eagle Online
September 4	Labor Day Holiday-No classes
October 9-10	Fall Break-No classes
October 27	Last Day to Drop a Course with a "W"
November 22-24	Thanksgiving Holidays-No classes

December 1	Last day of classes Last Day to Withdraw from the University
December 4-8	Final Examinations
December 8	Commencement

Spring Semester 2024

November 13 - January 10	Registration for Spring 2024
January 11	Classes begin
January 15	Martin Luther King Holiday-No Classes
January 25	Last Day to Add or Drop Classes in Eagle Online
March 11-15	Spring Break
March 22	Last Day to Drop a Course with a "W"
April 26	Last day of classes Last Day to Withdraw from the University
April 29-May 2	Final Examinations
May 3	Commencement

This calendar is subject to change at any time prior to or during an academic term due to emergencies or causes beyond the reasonable control of the institution, including severe weather, loss of utility services, or orders by federal or state agencies.

General University Information

- Centers of Excellence
- Student Support Services

Statement of Mission

Tennessee Technological University's mission as the state's only technological university is to provide leadership and outstanding programs in engineering, the sciences, and related areas that benefit the people of Tennessee and the nation. The University also provides strong programs in the arts and sciences, business, education, agriculture and human ecology, nursing, music, art, and interdisciplinary studies. Tennessee Tech serves students from throughout the state, nation, and many other countries, but it retains a special commitment to enrich the lives of people and communities in the Upper Cumberland region of Tennessee.

The University is committed to the lifelong success of students in its undergraduate, master's, specialist, and doctoral degree granting programs through high quality instruction and learning experiences. The University is engaged in scholarly activity, especially basic and applied research, creative endeavors, and public service, with special emphasis on community and economic development. The University supports student participation in a broad array of extracurricular activities as an integral component of its commitment to student life and success.

The University's three interdisciplinary Accomplished Centers of Excellence in Energy Systems Research, Manufacturing, and Water Resources and Chairs of Excellence in Business Administration strengthen the instructional, research, and service mission of the University.

The University is as supportive of women as of men and as supportive of those in the minority as of those in the majority. The University provides educational opportunities to all eligible persons without regard to age, gender, ethnicity, race, religion, national origin, disability, or sexual orientation.

Tennessee Technological University is a member of the State University and Community College System of Tennessee and is governed by the Tennessee Board of Regents. Approved by the Tennessee Board of Regents on December 3, 2004.

Vision Statement

Tennessee Tech will be nationally recognized as a leading technological university in the South, providing academic, economic and cultural leadership in the region and producing practical, ready-to-work graduates from a broad range of academic disciplines prepared to compete in a technologically driven world.

Mission of the Graduate School

The mission of the Graduate School is to promote, coordinate, enhance the quality of, and serve as an advocate for graduate education programs at Tennessee Technological University.

Vision of the Graduate School

The vision of the Graduate School is to improve human knowledge through teaching, learning, research and outreach.

The University Campus

Cookeville, Tennessee, the site of Tennessee Technological University, is located within a day's drive of about 75% of the nation's population via Interstate 40, Highway 70 North, and Highway 111. Cookeville is just 70 miles East of Nashville and 110 miles West of Knoxville, with Chattanooga 100 miles to the South. Major airline services are available through Nashville, Knoxville, and Chattanooga.

The City of Cookeville has a population of more than 26,000 residents and is located on the eastern Highland Rim of Tennessee at an elevation of 1,140 feet. Cookeville is the 'hub' of the 14-county Upper Cumberland region of about 317,000 citizens. The local public schools, civic clubs, and churches have a friendly and cooperative relationship with students, faculty, and patrons. The surrounding area, enhanced by three major lakes, abounds in natural beauty and is served by several state park including Burgess Falls and Cummins Falls state parks. Cookeville is just minutes from top-rated golf courses, lakes, rivers, hiking, championship fishing, hunting, and an amazing variety of sports (including Tennessee Tech University's) and other activities.

The campus consists of a tract of 235 acres made attractive by building architecture, shrubbery, native trees, and a system of driveways and walkways; making travel to and from buildings to parking lots easy and convenient. A current map of the university may be found on the TTU website.

Research Opportunities

Research is an integral part of the University and is broadly defined to include studies, investigations, and other scholarly and creative pursuits. Faculty involvement may be on an individual basis or as members of interdisciplinary teams. Many faculty include students in their research activities and are encouraged to do so.

The University's membership in research oriented organizations compliments and enhances both faculty and student research opportunities. Among the organizations is Oak Ridge Associated Universities (ORAU).

Since 1981, students and faculty of Tennessee Technological University have benefited from its membership in Oak Ridge Associated Universities (ORAU). ORAU is a consortium of 96 colleges and universities and a contractor for the U.S. Department of Energy (DOE) located in Oak Ridge, Tennessee. ORAU works with its member institutions to help their students and faculty gain access to federal research facilities throughout the country; to keep its members

informed about opportunities for fellowship, scholarship, and research appointments; and to organize research alliances among its members.

Through the Oak Ridge Institute for Science and Education (ORISE), the DOE facility that ORAU operates, undergraduates, graduates, postgraduates, as well as faculty enjoy access to a multitude of opportunities for study and research. Students can participate in programs covering a wide variety of disciplines including business, earth sciences, epidemiology, engineering, physics, geological sciences, pharmacology, ocean sciences, biomedical sciences, nuclear chemistry, and mathematics. Appointment and program length range from one (1) month to four (4) years. Many of these programs are especially designed to increase the numbers of underrepresented minority students pursuing degrees in science- and engineering-related disciplines. A comprehensive listing of these programs and other opportunities, their disciplines, and details on locations and benefits can be found in the *ORISE Catalog of Education and Training Programs*, which is available at www.ornl.gov/orise/educ.htm or by calling either of the contacts below.

ORAU's Office of Partnership Development seeks opportunities for partnerships and alliances among ORAU's members, private industry, and major federal facilities. Activities include faculty development programs, such as the Ralph E. Powe Junior Faculty Enhancement Awards, the Visiting Industrial Scholars Program, consortium research funding initiatives, faculty research and support programs as well as services to chief research officers.

For more information about ORAU and its programs, contact the Office of Research at (931) 372-3374 or the web site at www.tnitech.edu/research. You may also contact the ORAU Corporate Secretary, at (865) 576- 3306 or visit the ORAU Home Page at www.ornl.gov.

There are identified units within the university that have a research component, and in some instances these units provide opportunities for student research focused in a particular area. One example is the Upper Cumberland Humanities and Social Sciences Institute. This interdisciplinary institute is designed to promote humanities and social sciences in the University and in the institution's service area through the Upper Cumberland Studies Program, funded research projects, and public service activities. Of particular interest are activities that deal with the Upper Cumberland region, promote interaction between various disciplines, and encourage cooperation between the community and the University.

Research is conducted in each division of the University, including the Centers of Excellence, and there are numerous opportunities for student involvement either directly on contracts and grants or on research assistantships. The University maintains an Office of Research which assists in the procurement of funds to support research.

Centers of Excellence

By authority of the General Assembly of the State of Tennessee, the Tennessee Higher Education Commission, and the Tennessee Board of Regents, three Centers of Excellence have been established at Tennessee Technological University. These accomplished Centers of Excellence focus on advanced interdisciplinary scholarship, including basic and applied research. Each center strives to utilize more efficiently the resources of the University in order to improve the general economic development of the State of Tennessee; improve the state's research base; and enhance the intellectual, cultural, and social activities of its citizens.

Among its priorities, each center attempts to attract internationally recognized faculty, as well as both undergraduate and graduate students who have strong scholarly backgrounds and a commitment to academic excellence.

Graduate students who become affiliated with a Center of Excellence must first qualify for admission into one of the University's graduate programs. Thereafter, in cooperation with the chairperson of the student's major department and the director of the center, the student may gain an assignment in research or similar scholarly activity; in most cases, the student will be appointed to a graduate assistantship or be given some remuneration for successful participation.

Center for Energy Systems Research

The Center for Energy Systems Research was established to advance and apply scientific and engineering knowledge associated with the generation, transmission, distribution, and use of electric power while supporting the instructional program of the University in academic areas related to electric power. In pursuing its goals, the Center works with electric utilities, state and federal agencies, private industries, nonprofit organizations, and other universities on a wide spectrum of projects. Research efforts, both theoretical and experimental, are focused on solving problems currently faced by the electric power industry. Specific research projects involve:

1. developing integrated software packages for the simulation and analysis of electric power systems to improve performance and reduce costs,
2. implementing innovative techniques to improve the utilization of fossil fuels in power plants, and
3. participating in basic research on emerging technologies to ensure that future electric power needs are met in an environmentally acceptable manner.

The Center, which is administered through the College of Engineering, provides opportunities for interdisciplinary research by involving faculty, staff, and students throughout the University. The Center has a positive impact on many facets of the electric power industry in the State of Tennessee and the nation.

Center for the Management, Utilization, and Protection of Water Resources

The Center for the Management, Utilization, and Protection of Water Resources focuses interdisciplinary scientific research on water resources issues in Tennessee, the surrounding region, and the nation. Its team approach to environmental research strengthens the University's educational program by combining faculty, professional staff, and students from agriculture, biology, chemistry, the Cooperative Fisheries Research Unit, earth sciences, engineering, and the social sciences into problem-solving groups. Center-supported graduate students pursuing degrees in one of these academic areas become important members of professional research teams. The Center is administered through the Office of Research & Economic Development. It maintains a staff with expertise in geographic information systems (GIS), modeling, and database management, and a professionally staffed laboratory, capable of general wet chemistry/physic parameter analyses, organic analyses, metal analyses, and biological/mutagenicity/toxicity testing. Basic techniques on solid-liquid phase interactions, chemistry, and the biological sciences provide support for fundamental and applied research. Current faculty research emphasizes:

1. biodiversity;
2. surface and ground water protection, use, and availability;
3. domestic, industrial, and recreational water use;
4. conservation and reuse of finite water supplies;
5. public education and the examination of socioeconomic problems of water treatment and distribution;
6. wastewater treatment and disposal; and
7. water pollution and the protection of aquatic organisms and other wildlife from point and nonpoint sources.

Center for Manufacturing Research

The Center of Excellence for Manufacturing Research was created to draw together resources of the State of Tennessee, the University, industries from Tennessee and abroad, and government funding agencies into a cooperative effort to be on the leading edge of the latest technological advances in manufacturing. The Center has a twofold mission:

1. to advance and support scientific and engineering knowledge in areas related to manufacturing, and
2. to enhance the University's instructional program in manufacturing-related areas.

The Center draws upon expertise from throughout the College of Engineering and various other colleges, departments, and the University, as appropriate, as well as resources outside the University. In addition, the Center employs dedicated faculty and staff that are responsible for enhancing and supporting our strategic research program. The Center for Manufacturing Research has concentrated on four (4) strategic research areas:

1. Intelligent Control of Processes and Equipment,
2. Integrated Product and Process Realization,
3. Next Generation Materials and Manufacturing Processes, and
4. Pervasive Modeling and Simulation.

The Center for Manufacturing Research also has a significant extension component with a focus on quality services provided to industry. Service activities can include externally funded research projects, small laboratory testing projects, an industry work-study program that matches industry needs for engineering assistance with engineering student capabilities, and small business support through a TSBDC that is partially supported by the Center.

Student Support Services

Alumni Association

The purpose of the Alumni Association is to promote the educational, social, and economic interests of Tennessee Technological University, its alumni, faculty, friends, and current students. All former students of Tennessee Technological University who earned a degree are recognized as alumni.

The Director of Alumni Relations coordinates the activities of the Alumni Association. The work of the Association is administered through the Office of Alumni Relations in consultation with the Association's Advisory Board. The advisory board consists of alumni representatives appointed by the Director of Alumni Relations and the current Advisory Board; it also includes a delegate from the Student Alumni Ambassadors.

Career Services

The Office of Career Services, located on the third floor of the University Center, provides a variety of career resources for graduate students. Advice and suggestions to maximize interviewing strategies and resume preparation are also provided. As the University's centralized recruiting facility, candidates for a graduate degree should register with the office two (2) semesters prior to their anticipated graduation date for assistance with their job search. Registration is required for students and alumni in advance of their participation in campus interview activities.

Recognizing the benefits to be gained through the use of cutting-edge technology, Career Services maintains a full service web site at <http://www.tntech.edu/career/>. Students, alumni, and employers can access information about campus recruiting activities including the ability to post and obtain resumes online. Electronic links have been set up as a quick resource tool to use when searching the Internet for career resources and opportunities. Interactive videoconferencing software enables students and alumni to interview with employers worldwide.

Computer Facilities

The D. W. Mattson Computer Center is equipped with a large-scale, modern digital computer, together with peripheral equipment for the rapid input, output, and storage of information. Although the Center satisfies the general administrative, instructional, and research needs of the University, there are numerous student computer labs located throughout the campus for instructional and research purposes. Many graduate students utilize computer facilities in their research pursuits. Lab locations and hours are posted on the ITS website.

Counseling Center

The Tennessee Tech Counseling Center, located in the Roaden University Center, provides a wide range of services. Counseling offers an opportunity for students to develop more effective means of resolving problems and acquiring strategies for achieving personal and professional goals. The Center also administers a number of standardized tests including the GRE (subject only) and MAT for students interested in or planning to attend graduate school. Outreach and consultation services on a variety of topics of interest to students are available.

Students experience varying degrees of difficulty related to the challenges of graduate school. Transition issues, stress management, interpersonal relationships, family issues, depression, and anxiety are among the concerns that students discuss in counseling. Strict confidentiality is maintained in the counseling process.

There is no fee for this service. Registered, enrolled students are eligible and may make appointments by calling the Counseling Center (931) 372-3331.

Financial Aid

Graduate assistantships constitute the primary source of financial aid for students enrolled in the Graduate School. Information concerning appointment of graduate assistants is found in the section entitled Organization of the College of Graduate Studies.

Students who have been admitted as regular students in a degree-seeking program may wish to complete the Free Application for Federal Student Financial Aid (FAFSA). Recipients of federal direct loans or work-study must be U.S. citizens or eligible noncitizens enrolled for at least five (5) semester hours (for federal aid purposes, halftime status is defined as enrollment for five (5) hours, three-quarter time status is defined as enrollment of six to eight (6-8) hours, and full-time is defined as enrollment of nine [9] hours). The interest on these loans is a variable amount (set by the federal government each year); interest and principal repayment may be deferred while the student is enrolled. The FAFSA is available online at www.fafsa.ed.gov.

You may also wish to review our website at www.tntech.edu/financialaid/ for further information about aid programs and procedures. In addition, you can use this site to link to the online version of the Free Application for Federal Student Aid (FAFSA).

In some instances graduate students may qualify for positions as head residents in the University's housing program. Information on available positions

Angelo and Jennette Volpe Library

The Angelo and Jennette Volpe Library is a centralized location for students to find information for academic development. In recent years, the library has undergone renovations to establish the 30,000 square foot Learning Commons, transforming the traditional library into a collaborative learning environment for students.

Library resources include both print and electronic collections with librarians to help students find the information they need. Students also have access to materials from other libraries through Interlibrary Loan. Individual desks, large study tables, private group study rooms, and practice presentation rooms are available to students for work on any project. The library offers computers, laptops, and multimedia equipment for student use.

Multicultural Affairs

Our mission is to provide personal, cultural, social, and academic growth and development for students of color. We provide and encourage opportunities for all students of color to learn about their history, take pride in their heritage, and explore their potential. We promote cultural awareness by providing an environment that embraces diversity.

Our office provides programs designed to encourage cultural awareness, as well as, educational opportunities outside the classroom. In addition, we provide tutoring, academic counseling, scholarships and internships to improve academic performance.

The Office of Multicultural Affairs is located in the Leona Lusk Officer Black Cultural Center, which houses a computer lab, conference room, and a library of African-American authors. We hope you will come visit and relax. It is a great place to meet new friends and become involved with student organizations

Residential Life

Tennessee Tech has 15 residence halls and a 304-unit apartment complex--called Tech Village Apartments--which provides housing accommodations for enrolled students--both undergraduate and graduate.

Residence hall rooms are designed for double occupancy; however, a few single rooms are available. Rooms are furnished to include standard twin beds and mattresses, desks, chairs, dressers, telephone, smoke detector, mini blinds, closets and a wastebasket. Additionally, all rooms receive expanded basic cable service at no additional charge. All residence halls have laundry facilities located in each building. Students may provide their own personal items to make their room more unique and comfortable.

Tech Village apartments are newly renovated and assigned to students in the following priority: married students, single students with child(ren), graduate students, students with disabilities, senior undergraduate students, and faculty/staff. Each apartment has a telephone, stove, refrigerator, garbage disposal, dishwasher, smoke detector, fire extinguisher, expanded basic cable service and mini blinds. Tech Village has a laundry facility, a community center with ice machine. Your monthly rent includes expanded basic cable service, local telephone service, water service, and garbage removal. Occupants pay for electric utilities and long-distance phone calls.

All residence halls are connected to ResNet. ResNet is short for Residence Hall Computer Network. Each of these residence hall rooms has a ResNet connection for each occupant, provided the student has a personal computer. Residents also have access to computer labs in designated residence hall lobbies and the Tech Village community center. Additionally, all residence halls and Tech Village students will have a voice mailbox assigned to them to be used in conjunction with their telephone service.

To secure an assignment on campus, simply complete either a residence hall or Tech Village application or by contacting the Office of Residential Life by calling (931) 372-3414 or toll free 1-800-255-8881 or online at www.tntech.edu/reslife/. On-line deposits may be made to secure your apartment/room. Applicants for residence hall assignments will be notified by the third week of July for a fall semester assignment, the second week of December for a spring assignment and the first week of May for a summer assignment. Applicants for Tech Village assignments will be notified as apartment space is available. Tech Village applicants are not guaranteed an apartment assignment; therefore, consider researching other housing options in the event an apartment does not become available.

Services for Students with Disabilities

The Office of Disability Services program is designed to improve the educational opportunities of students with disabilities and to create an accessible physical environment so that students may obtain their educational objectives. The Office also provides the University community with information pertinent to the successful integration of students with disabilities into the environment, as well as within the community at large.

All students with disabilities are urged to come by the Office of Disability Services to discuss their educational plans and any special needs they might have. Official documentation of a disability is necessary to determine the level of services that may be needed. The Office is located in Room 112, University Center. Students may also call for an appointment at (931) 372-6119.

Campus Health Services

Tennessee Technological University has a state-of-the-art campus health center which provides medical services for minor illnesses or injuries to any student enrolled at the University on a walk-in basis during hours of operation. The health service staff includes nurses, a nurse practitioner, physician, and pharmacist who plan and implement care for students during daytime hours Monday through Friday. The only charge made to a student is for medications, treatments, supplies, or laboratory work.

The student is responsible for expenses incurred for ambulance service, calls at a local physician's office, emergency services, and other services provided at Cookeville Regional Medical Center. Health and accident insurance is available to each student upon his/her registration at Tennessee Tech. This insurance coverage is authorized and approved by the Tennessee Board of Regents. Coverage provides hospital, surgical, and in-hospital medical protection on a year-round basis beginning with the first day of fall registration and continuing until the first day of fall registration the following year. Students may enroll in the plan during registration or at any time during the year by picking up an application at the Health Services Office (Infirmary).

Two (2) plans of coverage are available at reasonable rates. Optional maternity coverage is offered under both plans. Details concerning this insurance are available at the Student Health Service and during registration. Students are encouraged to participate in one (1) of the insurance plans, as it supplements the above services offered by Campus Health Services.

Administration and Faculty

Tennessee Tech Board of Trustees

The Tennessee Tech Board of Trustees were appointed by the Governor of Tennessee and approved the Tennessee General Assembly on February 13, 2017.

Current Trustee's Include:

Trudy Harper, Chair

Daniel Hines

Tom Jones

Fred Lowery

Thomas Lynn

Rhedona Rose

Johnny Stites

Teresa Vanhooser

Captain Barry Wilmore

Academic and Administrative Officers

Dr. Philip Oldham, President

Senior Administration

Dr. Lori Bruce, Provost and Vice President for Academic Affairs

Dr. Robert Owens, Chief Diversity Officer

Dr. Claire Stinson, Vice President for Business and Fiscal Affairs

Dr. Cynthia Polk-Johnson, Vice President for Student Affairs

Vacant, Vice President Research

Dr. Kevin Braswell, Vice President of University Advancement

Dr. Mark Stephens, Senior Associate Provost and Dean of the College of Graduate Studies

Dr. Sharon Huo, Associate Provost

Mrs. Karen Lykins, Vice President Enrollment and Communication

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Mark Wilson, Director of Athletics

Kevin Vedder, Associate Vice President of Human Resources

Academic Deans

Dr. Darron Smith, Dean of the College of Agriculture and Human Ecology

Dr. Jeff Roberts, Interim Dean of the College of Arts and Sciences

Dr. Thomas Payne, Dean of the College of Business

Dr. Jennifer Shank, Dean of the College of Fine Arts

Dr. Lisa Zagumny, Dean of the College of Education

Dr. Joseph Slater, Dean of the College of Engineering

Dr. Mike Gotcher, Dean of the College of Interdisciplinary Studies

Dr. Kimberly Hanna, Dean of Whitson-Hestor School of Nursing

Dr. Sharon Holderman, Interim Dean of University Library and Learning Assistance

Administrative Staff

For the most current listing of Tennessee Tech administrative staff, visit the TTU home page and click on in the search bar click on "People Finder". You may search by name or department.

Presidents of the University

Thomas Alva Early

1916 - 1920

University of Georgia.

Quentin Miller Smith

1920 - 1938

B.S., George Peabody College for Teachers, 1917; M.A., 1927.

James Millard Smith

1938 - 1940

B.S., West Tennessee State Teachers College, 1929; M.A., George Peabody College for Teachers, 1930.

William Everett Derryberry

1940 - 1974

B.A., Summa Cum Laude, The University of Tennessee, 1928; B.A., (Honours) School of English Language and Literature; and M.A., Oxford University, Oxford, England, 1932; D.Litt., University of Chattanooga, 1965; LL.D., Pepperdine College, 1967.

Arliss Lloyd Roaden**1974 - 1985**

A. A., Cumberland Junior College, 1949; B.A. Cum Laude, Carson-Newman College, 1951; M.S., The University of Tennessee, 1958; Ed.D., 1961.

Wallace Samuel Prescott**1985 - 1987**

B.S., Tennessee Polytechnic Institute, 1946, M.S., The University of Tennessee, 1952; Ph.D., University of Illinois, 1961.

Angelo Anthony Volpe**1987 - 2000**

B.S., Brooklyn College, 1959; M.S., University of Maryland, 1962; Ph.D., 1966.

Robert R. Bell**2000 - 2012**

B.S., University of Florida, 1969; M.A., 1970; Ph.D., 1972.

2012 - present**Philip Oldham**

B.S., Freed-Hardeman University, 1980; Ph.D., Texas A&M University, 1985.

Organization of the College of Graduate Studies

The College of Graduate Studies reports to the Provost's Office and is responsible for promoting, coordinating, enhancing the quality of, and serving as the advocate for graduate education programs at Tennessee Technological University. Our goals are to enhance the intellectual community of scholars among graduate students and faculty; provide quality control of all graduate education programs; promote academic excellence of all graduate programs; and support and facilitate research and scholarly activities. The policies that govern the college are developed by the Graduate Studies Executive Committee which includes faculty members, administrators and student members.

- Graduate Faculty
- Graduate Assistants

Graduate Studies Executive Committee

Policies that govern the organization and administration of the College of Graduate Studies are developed by the Graduate Studies Executive Committee. As authorized by the Administrative Council of the University, the membership of this committee includes a minimum of nine (9) faculty members, representing the six (6) colleges in which graduate programs are offered; a minimum of eight (8) administrators, to include representation from each of the six (6) colleges; a minimum of four (4) student members, also representing the six (6) colleges; and such nonvoting advisory members as may be determined by the President of the University. The Dean of the College of Graduate Studies serves as executive officer. All appointments are made by the President. The chairperson of the committee is elected annually.

The Dean of the College of Graduate Studies, in collaboration with the Executive Committee, exercises overall review and supervision of graduate programs and provides leadership in developing new programs and in improving standards for existing programs.

Graduate Faculty

Appointment and Qualifications of Graduate Faculty

Status	Minimum Eligibility Criteria	Responsibilities	Term *
FULL -full-time faculty member, emeriti, senior affiliate faculty or academic administrator holding faculty rank; -rank of assistant professor or higher -tenured or tenure-track	-Meets criteria for Associate Membership -criteria for reappointment are based on evidence of continued pattern of scholarly or creative activity of the quality expected for initial membership.	-may serve as a student's academic advisor for the Doctor of Philosophy degree; -may teach graduate courses for Master's, Specialist, and Doctoral degrees	6 Years
ASSOCIATE -full-time faculty member who is not eligible for full membership	-holds an earned doctorate or equivalent terminal degree in an appropriate discipline from an appropriately accredited institution; -demonstrated competence to carry out the departmental needs for graduate teaching, advisement, or research	-may serve as a student's academic advisor for Master's and Specialist degrees -may teach graduate courses for Master's, Specialist, and doctoral degrees	3 Years
ADJUNCT -part-time faculty who are employed for graduate teaching, advisement, or research	-holds an earned doctorate or equivalent terminal degree in an appropriate discipline from an appropriately accredited institution; -demonstrated competence to carry out the departmental needs for graduate teaching, advisement, or research	-may serve as a committee member for Master's and Specialist degrees; -may teach graduate courses for Master's, Specialist, and doctoral degrees	3 Years
CLINICAL -full or part-time faculty who participate in directing educational experiences in a clinical/professional setting where the faculty member practices	-holds at least a master's degree and professional certification in an appropriate discipline from an appropriately accredited institution/agency/association and relevant experience in the field of study	-may only teach clinical or practicum designated courses	3 Years

* Eligibility for renewal is based on a review of credentials during the years of their appointment period listed.

All appointments to memberships on the graduate faculty are made by the President based upon recommendations submitted by departmental chairpersons with suitable endorsement from the dean of the college, the Dean of the College of Graduate Studies, and the Vice President of Academic Affairs. The appropriate forms may be obtained from the College of Graduate Studies website.

It is also possible for a member of the Graduate Faculty to have their Graduate Faculty status revoked by the dean of their college or school, or the Dean of the College of Graduate Studies, outside the periodic review

process. Revocation may occur for egregious acts or when a Graduate Faculty member fails to fulfill the responsibilities of a member of the Graduate Faculty to teach graduate student(s) effectively, in a civil, professionally appropriate manner; to do scholarly research and creative work of high quality or remain active in the practice of the profession; to adhere to university policies related to graduate programs; and to direct the research/professional development of graduate student(s) so that they progress toward graduation in a timely manner appropriate to the field. If Graduate Faculty status is revoked, the faculty member has the right to make an appeal against the decision to the Provost. This appeal must be made in writing within 14 days of the Dean of the College Studies providing notification of the removal of Graduate Faculty status. The Provost is the final arbiter of the decision to revoke Graduate Faculty status.

Responsibilities of the Graduate Faculty

An instructor of any course for which students receive graduate credit must be a member of the graduate faculty. When students are enrolled in undergraduate classes (4000/5000) for graduate credit, the faculty member has the responsibility of making appropriate additional assignments to ensure students receive proper value from the courses. A general description of the extra work required of students taking a 4000/5000 level course for graduate credit must be included in the description of the course approved by the Graduate ~~School~~ Studies Executive Committee. Instructors of undergraduate courses are provided class rolls that show the names of those students seeking graduate credit for work in their classes.

A faculty member may not direct independent study/research courses taken by a student who is a relative of the faculty member and may not be a member of a relative's graduate advisory committee. For the purposes of this policy, "relative" means a parent, foster parent, parent-in-law, child, spouse, brother, foster brother, sister, foster sister, grandparent, grandchild, son-in-law, brother-in-law, daughter-in-law, sister-in-law, or other family member who resides in the same household.

Responsibilities of Departmental Chairperson

Primary responsibility for determining that a faculty member meets the above requirements rests with the departmental chairperson and those faculty members in the department who are members of the graduate faculty; with oversight being provided by the dean of the college, the Dean of the College of Graduate Studies, and the Vice President for Academic Affairs. Service as a graduate student's academic and/or research advisor must be reviewed and approved by the student's departmental chairperson, the dean of the college, and the Dean of the College of Graduate Studies. At the discretion of the departmental chairperson, responsibilities of an associate member may be any of those normally given to a full member of the graduate faculty, except service on the Graduate Studies Executive Committee, or serving as a doctoral-level academic or research advisor.

The chairperson of any department offering a graduate degree may act in any capacity open to a graduate faculty member and has certain administrative responsibilities pertaining to the graduate program. The chairperson will oversee the process of reviewing applications of prospective graduate students including working with faculty in the department to develop admission criteria and an application review process; and nominating qualified faculty members for appointment to the graduate faculty. The departmental chairperson also provides direction and coordination in supporting departmental faculty members in the development of research projects and in the appropriate utilization of facilities.

Organization and Appointment of Advisory Committee

The advisory committee may be appointed during the student's first term but no later than the term in which 15 credits of course work are to be completed. The student, in consultation with the departmental chairperson or academic advisor, will determine a minimum of three (3) in the Master's and Specialist in Education, four (4) in the doctoral program in Education; five (5) in the doctoral programs in Engineering and Environmental Sciences, suitable graduate faculty members who are willing to serve as voting members of the committee. Degree programs with a capstone course will have oversight of a pre-assigned Program Coordinator/Director/Chairperson. Members shall

represent each of the areas in which the student expects to study, with two (2) members having background in the major area. Each area in which the student presents as many as six (6) credits should be represented by one (1) member. At least one (1) member of the advisory committee should have adequate background and research interests in the area in which the student has proposed a research objective.

Role	Eligibility Criteria	Responsibilities
ACADEMIC	<ul style="list-style-type: none"> -experienced faculty member; -demonstrated ability to effectively mentor students 	<ul style="list-style-type: none"> -may serve as a student's academic advisor; -shall chair or co-chair the student's advisory committee
RESEARCH	<ul style="list-style-type: none"> -demonstrated significant research capability; -experienced in directing independent study; -may hold rank in a department other than that in which the student is majoring -research capability in a discipline closely related to a discipline associated with the student's department 	<ul style="list-style-type: none"> -may serve as a student' academic advisor for Master's and Specialist degrees

Changes to the advisory committee must be requested by the student and approved by the departmental chairperson, the dean of the college, and the Dean of the College of Graduate Studies. Except in unusual circumstances such as extended campus leave, change of teaching fields, or inappropriate advisement loads, a faculty member enjoys the prerogative of accepting or relinquishing an appointment on a student's advisory committee.

Non-university professionals may become voting members of graduate committees as consultants. These consultants must have earned a doctorate or equivalent terminal degree in an appropriate discipline and completed all procedures necessary to be appointed as an Adjunct Member of the graduate faculty. Only one (1) such member may serve on an individual student's committee, and this member may not serve as academic or research advisor. Consultants not meeting the above requirements may serve on the committee but do not have voting privileges.

Each member of a graduate student's advisory committee is expected (1) to review the student's proposed plan of study and to approve it or make recommendations to improve it; (2) to consider the student's application for candidacy including both the proposed plan of study and the research proposal and, with other members of the committee, to approve, approve with change, or disapprove the program; (3) to review the student's thesis (if one is required) prior to the comprehensive examination; and (4) to assist in the conduct of an examination to insure that the student has at least a satisfactory knowledge of the subject matter covered in the program of study and that the thesis (when required) is of suitable caliber and presents a valid investigation properly completed. The minimum required majority for all actions of the advisory committee at the master's and specialist levels is three (3) positive votes, or three-fourths of the committee members eligible to vote. At the doctoral level, four-fifths is required as the minimum for programs in Engineering and Environmental Sciences; a unanimous vote is required for the program in Exceptional Learning.

Responsibilities of Thesis Advisor

The chairperson of an advisory committee assists the student in the selection of a course of study and works with the student in choosing a suitable thesis topic. The chairperson is expected to furnish appropriate assistance and encouragement when excessive difficulties arise in the investigation of the problem. At the request of the student, the chairperson schedules the comprehensive examination and is responsible for its administration and conduct, as well as the reporting of the examination results to the Dean of the College of Graduate Studies. The chairperson is responsible for assisting the student in ensuring the thesis is error-free in regards to format, grammar, spelling,

punctuation, and content thereby meeting the standards of excellence expected by the advisory committee, department, and the College of Graduate Studies. Only grades of SP and NP shall be used to indicate a student's progress in thesis or dissertation credit.

Turnitin Use Guidelines & Self-Study Materials

Turnitin is software that Tennessee Tech University provides to faculty to evaluate student work for originality, online grading, and peer review. This resource has been made available to the graduate school faculty and offers an excellent mechanism for educating students about the nature of academic integrity, as well as the mechanics of proper citation of sources.

Before you begin using Turnitin we strongly recommend that you go through a brief set of self-study training materials available through iLearn. Also, please familiarize yourself with the current TTU Student Academic Misconduct Policy 217.

Graduate Assistants

Preamble

Programs of graduate study are designed to transform the individual from student to (knowledgeable practitioner or) professional scholar. When a graduate assistantship is well conceived and executed, it should serve as an ideal instrument to help facilitate the desired transformation. The primary goal of an assistantship, then, is to facilitate progress toward the graduate degree. Rather than interfere or conflict with the student's educational objective, the assistantship is to aid in the prompt and successful completion of the degree program. While the student assistant makes progress toward an advanced degree, he or she also receives work experience in a profession under the supervision of a faculty mentor.

The graduate assistant is both student and employee. As a student, the graduate assistant is expected to perform well academically to retain the assistantship. He or she is to be counseled and evaluated regularly by a faculty mentor so as to develop professional skills. As an employee, the graduate assistant is expected to meet teaching, research, and/or administrative obligations. He or she is to work under the supervision of experienced faculty and receive in-service training. In sum, the graduate assistant receives financial support for graduate study by contributing to the teaching and/or research mission of the university. The totality of responsibility may be greater than that required of other students or staff members, but the opportunities for professional development also are greater for the graduate assistant.

- Tennessee Conference of Graduate Schools

Appointment of Graduate Assistants

There are four (4) classifications of graduate assistantships:

1. Graduate Teaching Assistant (GTA)
2. Graduate Teaching Associate (GTS)
3. Graduate Support Assistant (GSA)
4. Graduate Research Assistant (GRA)

Appointments are made upon unit recommendation of the department in which the assistantship is available, provided the recommendation is appropriately endorsed by the Dean of the College and the Dean of the College of Graduate Studies. Unless other arrangements are specified, it is assumed the graduate assistant will pursue a degree objective in the department where the assistantship assignment is made. Applications for assistantships are found on the Graduate College website.

Graduate Assistantship awards are available for qualifying graduate students. Consideration is given on the basis of academic preparation, major area of study, and the availability of funds. Additional information may be found on the Graduate College website.

A graduate student must be admitted to full standing in a Tennessee Tech graduate program to be eligible to apply for a graduate assistantship. The period of appointment is normally for one (1) academic year at a stipend determined by the department in which the assistantship is available.

The graduate assistant must maintain a cumulative 3.0 GPA. If the Graduate Assistant's cumulative GPA falls below the required 3.0 GPA, but not less than 2.0 GPA, the Appointing Authority may authorize continuation under probationary status for one semester.

Overview of Duties of Graduate Assistants

Graduate Assistantships are an option for graduate student funding for higher education and are a form of graduate student employment, providing a compensation package that includes both a monthly stipend and a waiver for tuition and fees. The assistantship allows students to perform research, teaching or other support services for the University as part of their academic professional training and development. Assistantship students will be appointed as a Research Assistant (GRA), Teaching Assistant (GTA), Graduate Teaching Associate (GTS), or Graduate Support Assistant (GSA) with a maximum of 20 hours per week of assigned duties. The majority faculty advisor (or other assigned departmental faculty) determines the duties of the appointment. No vacation or sick benefits are applicable, but there will be no change in monthly stipend amounts and no Graduate Assistantship services required for any University holidays that the University is closed. Arrangements for any variation in work hours, including time off for vacation, holidays, or illness, should be made individually with the major advisor (or other assigned faculty). Graduate assistants receiving teaching, research, or support assignments are expected to devote sufficient hours per week as may be required to perform all duties necessary to satisfactorily complete all degree requirements. Students holding full assistantships are assigned duties which require approximately one-half the workload of a full-time faculty member.

An international graduate student, who is on an F-1 or J-1 visa, can work no more than 20 hours per week while school is in session. On-campus employment may exceed 20 hours per week during the summer for eligible international students who plan to register for the following semester if approval is granted by their major advisor, department chair, college dean, International Education, and the Dean of the College of Graduate Studies. Under federal regulations, volunteering by an international graduate student for teaching, research, or other support activity is regarded as employment that must be compensated at a fair wage.

Each academic college and/or department may have requirements in addition to the University. Graduate students are required to become knowledgeable of college and/or departmental policies concerning Graduate Assistantships.

TYPES OF ASSISTANTSHIPS

A graduate student may hold an assistantship in one of the following categories:

1. Graduate Teaching Assistant (GTA)

Graduate Teaching Assistants work under the the direct supervision of a Tennessee Tech faculty member performing one or more of the following responsibilities:

- Assist in teaching a classroom section of a course,
- Assist in teaching a laboratory or discussion section of a course,
- Tutor or provide other special assistance to Tennessee Tech students,
- Assist a faculty member in preparing lectures, grading, advising, and other duties necessary to conduct a course, or
- Assist directly or indirectly in instruction or supervision of Tennessee Tech students in community programs, internships, or seminars for practicing professionals.

2. Graduate Teaching Associate (GTS)

A GTS may have the same type of responsibilities as a GTA, but will have the responsibility of teaching an undergraduate course and be listed as a primary instructor of record for undergraduate courses only.

The Southern Association of Colleges and Schools Commission on Colleges (SACSCOC) specifies that a GTS who has primary responsibility for teaching a course for credit and/or assigning final grades for such a course must:

- Have earned at least 18 graduate credit hours in his/her teaching discipline,
- Be under the direct supervision of a Tennessee Tech faculty member experienced in the teaching discipline,
- Receive regular in-service training, and
- Be regularly evaluated by the GTS's direct supervisor.

3. Graduate Support Assistant (GSA)

Graduate Support Assistants are appointed to perform various types of duties other than those related directly to teaching or research, such as supervisory or administrative functions, by the Appointing Authority.

4. Graduate Research Assistant (GRA)

A Graduate Research Assistant has varying duties according to the specific research project to which the graduate student is assigned by the Appointing Authority. The duties of a GRA are limited to research activities.

Requirements for Eligibility and Maintaining an Appointment

1. A graduate student must be admitted to full standing in a Tennessee Tech graduate program to be eligible to apply for a graduate assistantship.
2. A graduate student seeking a graduate assistantship must complete the Graduate Assistantship application and file a copy with each department in which the graduate student is seeking a graduate assistantship.
3. No Tennessee Tech employee can make a graduate assistantship offer in writing or verbally unless s/he has explicit authority to make such offers.
4. The Appointing Authority should send a copy of all international student graduate assistantship offer letters to the TTU International Education office.
5. Graduate students who are in a co-op program are not eligible for a Graduate Assistantship.
6. A Graduate Assistant will perform all graduate assistantship duties at the Tennessee Tech campus or at a Tennessee Tech approved off-campus facility under the direct guidance of his/her assigned supervisor or Appointing Authority.

Graduate Assistant GPA Requirements

A Graduate Assistant must maintain a cumulative 3.0 GPA. If a Graduate Assistant's cumulative GPA falls below the required 3.0 GPA, but not less than 2.0 GPA, the Appointing Authority may authorize continuation under probationary status for one semester.

Permissible Loads of Graduate Assistants

Registration requirements for Graduate Assistants to receive and maintain full-time graduate student status, is as follows:

1. For the summer semester, a Graduate Assistant must register for a minimum of one (1) graduate credit hour but not more than 12 graduate credit hours.
2. For the fall and spring semesters, a Graduate Assistant must register for a minimum of six (6) graduate credit hours but not more than 12 graduate credit hours.

Qualifications of Graduate Teaching Associates (GTS)

The Southern Association of Colleges and Schools Commission on Colleges (SACSCOC) specifies that Graduate Teaching Associates who have primary responsibility for teaching a course for credit and/or assigning final grades for such a course must have earned at least 18 graduate semester hours in their teaching fields, be under the direct

supervision of a faculty member experiences in the teaching discipline, receive regular in-service training, and be regularly evaluated.

The 18-hour requirement does not apply to Graduate Teaching Assistants who are engaged in assignments such as laboratory assistance, teaching physical education activities, attending or helping prepare lectures, grading papers, keeping class records, and conducting discussion groups.

The appropriate departmental chairperson has responsibility for certifying that the 18-hour requirement is met either through coursework or by documentation that the graduate assistant meets the requirement as an exception. The appropriate form will be submitted and approved by the Office of the Provost prior to the beginning of the semester.

Competency in English

Tennessee Technological University requires all who teach to be proficient, as determined by Tennessee Tech, in oral and written English.

Stipends, Tuition and Fees

Each Appointing Authority establishes the minimum stipend amount for its Graduate Assistants. The Appointing Authority will pay, on a pro rata basis, tuition, maintenance fees, debt service fees, TN eCampus on-line fees, MBA distance course fees, and some special academic course fees based upon the Graduate Assistant's assistantship classification as full-time (100%) or one-half time (50%) assistantship. The Graduate Assistant is responsible for all other costs including books, international fees, and any other fees assessed.

Only courses listed on the graduate student's program of study will be covered by the graduate assistantship.

Unless a Graduate Assistant receives prior approval from the Appointing Authority, course repetitions and course withdrawals will not be covered by the graduate assistantship.

Graduate Assistants must notify the Appointing Authority of all course withdrawals.

Termination/Resignation/Cancellation of Graduate Assistantships

Absent good cause, if a Graduate Assistant fails to meet the requirements in the offer letter, the Appointing Authority will terminate the assistantship.

All graduate assistantships terminate immediately if the Graduate Assistant is dismissed for academic reasons.

If a Graduate Assistant decides to resign from his/her assistantship before expiration of the assistantship, the Graduate Assistant should notify the Appointing Authority in writing two (2) weeks before the date of resignation and should complete an exit interview with the Appointing Authority.

If the Appointing Authority determines that the Graduate Assistant has completed his/her degree program and all research requirements mid-semester, the Appointing Authority may cancel the stipend for the Graduate Assistantship or continue it until the end of the semester.

If Tennessee Tech terminates the graduate assistantship or the Graduate Assistant resigns, forfeits, or withdraws from Tennessee Tech during a semester:

- The Graduate Assistant will be responsible for paying his/her academic tuition fees on a pro rata basis for the remainder of the term.
- The Graduate Assistant's financial responsibility will be based on the number of days left in the semester at the time the assistantship ends and reclassification of residency in accordance with TTU Policy 253 (Residency Classification).

- Should a Graduate Assistant believe there is sufficient justification for an exception to the tuition fee balance owed by the Graduate Assistant, s/he must submit the Request for Exception to University Requirement form to the Tennessee Tech Bursar's office for review and final disposition.

Resolution Regarding Graduate Scholars, Fellows, Trainees, and Assistants

Acceptance of an offer of financial support (such as a graduate scholarship, fellowship, traineeship, or assistantship) for the next academic year by a prospective or enrolled graduate student completes an agreement that both student and graduate school expect to honor. In that context, the conditions affecting such offers and their acceptance must be defined carefully and understood by all parties.

Students are under no obligation to respond to offers of financial support prior to April 15; earlier deadlines for acceptance of such offers violate the intent of this Resolution. In those instances in which a student accepts an offer before April 15, and subsequently desires to withdraw that acceptance, the student may submit in writing a resignation of the appointment at any time through April 15. However, an acceptance given or left in force after April 15 commits the student not to accept another offer without first obtaining a written release from the institution to which a commitment has been made. Similarly, an offer by an institution after April 15 is conditional on presentation by the student of the written release from any previously accepted offer. It is further agreed by the institution and organizations subscribing to the above Resolution that a copy of this Resolution should accompany every scholarship, fellowship, traineeship, and assistantship offer.

-National Council of Graduate Schools

Admission to the College of Graduate Studies

General University Graduate Admissions Requirements

Admission to the College of Graduate Studies is open to anyone holding a bachelor's or master's degree from an accredited college or university (for a list of accrediting agencies recognized, refer to the U.S. Department of Education website). A foreign degree must be equivalent to a U.S. Bachelor's degree and must be accredited by its regional or national accreditation agency or Ministry of Higher Education. Applicants should have completed undergraduate or graduate work of sufficient quality and scope to enable them to successfully pursue graduate study. Tennessee Tech University offers equal educational opportunity to all persons, without regard to race, religion, sex, age, creed, color, national origin, or disability.

Students are admitted to Tennessee Tech University through a cooperative effort of the Graduate College and the departments, colleges, and schools of the University. When the Graduate College receives the student's application material, an official file is established. The department then reviews the application file and makes a recommendation to the Graduate College. The Graduate College notifies applicants as soon as a decision has been reached.

Applicants must submit the following for admissions consideration:

- An application for admission.
- Official transcripts of undergraduate and graduate credit from all institutions attended.
- Letters of recommendation from persons acquainted with the applicant's scholastic and professional accomplishments. The individual department will determine the requirements for letters of recommendation.
- Graduate admissions test scores. The individual major department or division will determine the minimum test score requirement for admission and readmission, subject to approval by the respective college-level committees, college dean, and the Graduate Studies Executive Committee.

- All graduate applications must be accompanied by a one-time non-refundable graduate application fee (\$35.00 for domestic applicants; \$40.00 for international applicants). Applications received without the application fee will not be processed.
- Any other applicable requirement required by the major department or division to which the applicant is applying.

An applicant who was previously enrolled in a graduate degree program but had a break in enrollment, excluding the summer term, must reapply.

All application materials become the property of Tennessee Tech and will not be returned to the applicant regardless of whether admission is approved or denied.

In order to be admitted to a degree program in any academic unit, applicants are also required to meet any additional standards set by the department, school, or college. Applicants are selected on a competitive basis and, therefore, admission is not granted to all applicants who meet only the minimum requirements. In addition, academic programs may have additional requirements such as portfolios, proficiency examinations, professional licensing, etc.

Individual program requirements are described in the Tennessee Tech University Graduate Catalog and on department websites. Requirements are subject to change. The Graduate College no longer accepts hard-copy (paper) applications. Please visit the Graduate College web site for detailed program admission requirements, deadlines, and to begin the on-line application process.

Additional Admissions Requirements for International Students:

In addition to the requirements stated above, international students must submit sufficient proof, as determined by Tennessee Tech, of adequate training and ability in the use of English as evidenced by a satisfactory score on recognized and acceptable tests. Acceptable test scores are defined under the admissions international student tab in this catalog.

Tennessee Tech will prepare Form I-20 for those admitted students seeking to apply for F-1 visa and DS2019 for those admitted students seeking to apply for a J-1 visa.

Enrollment in a program is contingent on the student receiving an appropriate visa.

All credentials become the property of the University and will not be forwarded or returned. If the applicant does not enroll, credentials will be maintained in active files for 1 year, after which they will be destroyed. After that time, candidates must reapply for admission and submit a new set of credentials if they wish to be admitted to the Graduate College. Students who do not enroll for a Fall or Spring semester must apply for readmission.

Admission Classifications

International Students

International students having adequate preparation for graduate study may apply for admission, but applications should be filed at least six months prior to the anticipated date of enrollment. Midyear enrollment is strongly discouraged. In addition to the requirements mentioned in the paragraphs above, all students from non-English-speaking countries must submit proof of adequate training and ability in the use of English as evidenced by a satisfactory score on recognized and acceptable tests administered in the student's home country. Normally, it is expected that an applicant will submit a score of at least 525 (71 internet-based or 197 computer-based) on the Test of English as a Foreign Language (TOEFL) or base score of 6.0 on the International English Language Testing System (IELTS) or 48 on the Pearson Test of English (PTE). A student may waive the TOEFL or IELTS requirements if they earn Level 6 in all course areas and receive a letter of recommendation from the administrators of the International English Institute (IEI). Not all programs permit this. Please review the admissions criteria for your desired degree program. A TOEFL score of at least 550--79 internet-based or 213 computer-based or a PTE score of 53 is required for Engineering, M.B.A. and Nursing. If admitted to the Graduate School such students shall have as a condition attached to their admission the requirement of the English Placement Test, prior to enrollment, at

Tennessee Technological University. If the examination reveals that the student does not possess an adequate command of English, the student will be required to enroll in noncredit remedial English courses (ESL 1010- 20) and will be required to reduce the graduate course load accordingly.

	TOEFL - Test of English as a Foreign Language			IELTS	FLS	PTE
COLLEGE/SCHOOL	Paper-based Test	Computer-based Test	Internet-based Test	International English Language Testing System	International Language School	Pearson Test of English
Arts & Sciences, Education	525	197	71	6.0	Level 16 or 18*	48
Business, Engineering, Nursing	550	213	79	6.0	Level 16	53

**Check requirements of the specific college or department to determine level needed for admissions.*

Applicants must also give satisfactory proof of sufficient funds to cover all of their expenses including travel.

The Graduate School will not knowingly consider for admission any person who has entered the United States via an immigration visa issued for another university until that person has been enrolled in that university; thereafter, the usual transfer procedures would be implemented. International students who wish to transfer from another university to Tennessee Tech must submit the usual materials required for initial admission; additionally, each applicant must furnish:

1. official transcripts from the current institution;
2. a verification statement from that institution's international student advisor;
3. photocopies of Form I-20ID (front and back), the passport, the visa, and Form I-94.

Only transfer credit from an accredited university is permitted; each student is expected to complete a full program of study at Tennessee Technological University.

In cases where the undergraduate record may furnish insufficient evidence of any applicant's potential for success in graduate study, additional qualifying examinations may be administered by the department in which the applicant proposes to study. The cost of the tests will be borne by the applicant.

If admission is approved, Form I-20 will be issued as follows: not later than June 1 for the fall term, November 1 for the spring term, and April 1 for the summer term. These dates are consistent with immigration regulations and apply to all F-1 nonimmigrant students including those transferring from other U.S. institutions and those who are already enrolled at Tennessee Tech who wish to change from one degree program to another.

International students who are deficient in either written or spoken English are required to enroll in ESL 1010-1020 and to earn a grade of at least "C" in each course; waiver of this requirement may be permitted on the basis of satisfactory scores on the English Placement Test.

Resident Alien

A lawful permanent resident of the United States (holder of a "green card") may be required to take the English Placement Test or other tests to determine proficiency in English and the necessity for taking courses in English.

Admission Classifications

Students admitted to a master's program will be placed in one of the following categories: full standing, provisional standing, or special standing.

Full Standing

This category indicates that in the opinion of the appropriate department and the Associate Dean of Graduate Studies the student has an adequate background for pursuing graduate work, and that all minimum requirements for admission to graduate standing have been met.

Provisional Standing

This classification denotes that the student does not qualify for full standing due to deficiencies in meeting specific program requirements. "Provisional Standing" is not equivalent to "conditional" admission for the purpose of international student enrollment.

Special Standing

A classification that denotes that the student has declared a non-degree graduate objective.

Conditional Admission

A classification that denotes an applicant has applied for graduate admission, has met minimum GPA requirements, and has been issued a letter to assist with obtaining immigration documents to attend an English language institute. This does not grant admission to the applicant nor does it guarantee admission to Tennessee Tech or a specific program.

Change of Classification

The College of Graduate Studies will change a student's Provisional Standing to Full Standing when the deficiencies identified at the time of admission are removed, provided, at the sole discretion of the department and college,

1. the deficiencies are cured prior to the completion of 15 graduate hours or
2. after acceptable completion of nine (9) graduate hours if the sole deficiency is caused by an unacceptable admissions exam score. A student's failure to remove the deficiencies by the deadline established by Tennessee Tech Graduate Admissions will result in a registration hold being placed on future registrations until such time as the deficiencies have been removed.

Special Admissions

Admission of Faculty Members to Graduate Studies

In addition to meeting the usual requirements for admission to the graduate degree program, an employee's supervisor, the Dean of the College of Graduate Studies, and the Provost must approve the request.

Admission of Seniors to Graduate Courses

A senior student within 18 hours of completing the requirements for the Bachelor's Degree may take up to nine (9) hours of graduate credit (5000 and 6000 level courses) provided that:

- The student's record gives indication that the student could achieve Graduate Admissions "Full Standing" classification at the conclusion of the undergraduate program and
- The student's departmental advisor, graduate course instructor(s), chairperson of the department(s), and Associate Dean of the College of Graduate Studies approve the student's request.

A senior student within 18 hours who does not meet the "Full Standing" criteria of may take up to nine (9) hours of 5000 level courses. Credit earned in this manner may be used for either undergraduate or graduate credit but not both.

Admission to Fast-Track Programs

The Fast-Track program is designed to enable Tennessee Tech undergraduate students to accumulate up to six (6) credit hours of graduate coursework, to satisfy both undergraduate and graduate degree requirements, while still pursuing their undergraduate degree. These hours can include either 4000/5000 dually-listed courses taken at the 5000-level or 6000-level courses.

All courses must be taken at Tennessee Tech.

The chair of the department must approve the courses as appropriate substitutions in the undergraduate curriculum.

Participation does not change the requirements for either the undergraduate or graduate program.

A student meeting the minimum admission requirements must apply to the department for admission to the Fast Track program. The department's graduate committee will review the application and make a decision on the application.

Upon graduation from the undergraduate degree program, the student must meet all requirements for graduate admission into Full Standing in the appropriate graduate degree program. Meeting these minimum requirements does not guarantee admission to the graduate program.

Admission of Transfer Students

An applicant for admission who has begun a graduate program at another college or university may be considered for admission to the College of Graduate Studies at Tennessee Technological University on a transfer basis consistent with Tennessee Tech Policy 283, General Graduate Transfer Credit Requirements.

A transfer applicant must be in good standing at the institutions previously attended.

Admission of Nondegree Graduate Students

Admission to graduate courses is available to persons who do not seek a graduate degree. Each applicant must submit their request to the department offering the graduate course after obtaining a Tnumber through the College of Graduate Studies. The applicant must provide proof of an earned bachelor's degree acceptable to the department offering the course. The applicant will submit a simplified uniform application form developed by the College of Graduate Studies directly to the Department. There will be no application fee to enroll in a course as a non-degree student. Departments offering such courses may require pre-requisite and other requirements as appropriate to allow the applicant to enroll in the course. Permission to enroll in the course is solely at the discretion of the department offering the course. Tuition and fees for such courses are charged according to university policies.

A non-degree graduate student, who subsequently wishes to be admitted into a graduate degree or a Graduate Certificate program, must submit a regular application through the CoGS and pay the application fee. The application must be reviewed according to the regular admissions process. Once admitted, the applicant may submit previously earned graduate credit hours (as a non-degree student) to the program department for review and inclusion in the graduate degree or Graduate Certificate program. The department will determine, at their sole discretion, and in accordance with SACSCOC Accreditation Standard 9.2, the number of non-degree credit hours it will accept towards such a degree or certificate.

International students on an F1 Visa are not eligible for admission as nondegree students.

Admission as an Additional Bachelor's Student

An additional bachelor's student is a post baccalaureate student but is not a graduate student and should not be confused with a nondegree graduate student. An additional bachelor's student is usually working toward a second undergraduate degree or taking undergraduate or graduate courses for undergraduate credit with no degree objective in mind. Additional bachelor's students apply through the undergraduate admissions office and are not counted as graduate students. An additional bachelor's student should not register for a graduate course without prior consultation with the Associate Dean of Graduate Studies; graduate credit **will not** be granted for graduate courses

taken while in the additional bachelor's status. A student who wishes to pursue a graduate degree should complete an on-line Graduate Admissions application and select a graduate degree program.

Admission to Class as an Auditor

An auditor is one who enrolls in classes on a noncredit basis, is expected to attend class, but is not required to hand in assignments or to take examinations. If the instructor is not satisfied with the attendance, the instructor may assign a grade of "W." A student who audits must be admitted to the University as a regular or special student.

Admission to class as an auditor requires the consent of the instructor and the approval of the Director of Records and Registration. The applicant should secure the Audit Registration form from the Office of Records and Registration. Fees for audit courses are the same as those for credit courses.

Readmission of Former Students

A former graduate student at Tennessee Technological University who is not currently enrolled at the University must submit an application for readmission.

Apply Now!

Resident Classification

The residence of a dependent student is presumed to be that of his/her parents. Residence (for fee-paying purposes) is interpreted to mean where the parents are domiciled. Unless the contrary appears from clear and convincing evidence, it is presumed that an emancipated person does not acquire domicile in Tennessee while enrolled as a full-time student at any public or private institution of higher education in the state. A student once classified as an out-of-state student will continue to be so classified unless a review of classification is requested. An emancipated individual who is working full time (30 hours per week or more) in Tennessee may register for up to 7 hours per term at in-state rates while establishing permanent residency.

A graduate assistant is classified as an in-state resident for fee-paying purposes only while he/she is an assistant. Residency will be reviewed when assistantship ends.

Change of residence status for tuition purposes is never automatic. A request for review must be made to the Dean of the College of Graduate Studies and adequate information must be provided by the student to warrant a review of resident status. Many factors, such as full-time employment for an extended period, are taken into consideration when a student's resident status is reviewed. If the review is negative, a request for exception may be filed with the Dean of the College of Graduate Studies and, then, the Graduate School Executive Committee.

If Tennessee residency is approved, the classification change shall be effective at the next registration after the approval has been granted.

Fees and Expenses

For the most complete and up-to-date fee and refund policy information, go to <https://www.tntech.edu/bursar/tuition>
No student may enroll or receive a diploma, transcript of records, or grade report until all matured debts or obligations to the University, or any phase of its program, have been cleared.

Registration and Enrollment Requirements

Inclement Weather Policy

Tennessee Technological University offices will remain open during periods of inclement weather even though classes may be canceled.

In accordance with TBR policy, faculty, administrators and staff of TTU are expected to make every reasonable effort to be at their work assignment on time, taking into consideration the personal risk involved. Administrators or staff

employees who anticipate arriving late, or not arriving at work at all, should notify their immediate supervisor of this fact as soon as possible and request annual leave for the period of absence. If faculty members must be absent from assigned classes due to inclement weather, it is their responsibility to notify the appropriate chairperson and/or dean.

If classes are not canceled despite inclement weather, students are responsible for any academic work they miss as a result of inclement weather. It is the individual student's responsibility to take the initiative in making up any missed work, and it is the faculty member's responsibility to provide students a reasonable opportunity to make up missed work. In the off-campus offerings, the students and faculty are all commuters. Furthermore, we have little or no control over the safety precautions taken at the off-campus sites. Thus, it is not unusual that such courses are canceled because of snow and/or ice during the winter. The decision to cancel classes will be made by the Provost. The information will then be disseminated as quickly as possible on the TTU website and through Text Alert.

Graduate Courses

- 5000-5990 Graduate Level
- 6000-6990 Graduate
- 7000-7990 Advanced Graduate
(Restricted to Graduate Students)

Graduate courses are numbered at the 5000, 6000, and 7000 levels and are offered in the College of Agriculture and Human Ecology, College of Arts and Sciences, College of Business, College of Education, College of Engineering, and College of Interdisciplinary Studies. These courses are described on the following pages and are listed by departments. Numerous senior level courses are permitted for graduate credit when offered dually as 4000 (5000) and taken at the 5000 level.

A graduate student may be permitted to register for any course which appears in the Schedule of Classes; however, only those courses taken at the 5000, 6000, and 7000 levels may be counted for graduate credit.

Courses which are dually numbered, i.e., 4000 (5000), are essentially undergraduate courses in which graduate students may earn graduate credit on the basis of required additional work defined by the instructor in the course syllabus. Graduate credit will not be given for a course numbered at the 4000 level or below. A course taken at the 4000 level may not be taken later at the 5000 level without special permission from the departmental chairperson, college dean, and the Dean of Graduate Studies.

At least 70% of the Graduate Course credit to be counted toward a master's degree must be at the 6000 level or above (with the exception of those programs that fall under state-wide numbering schemes, specifically TNeCampus, MPS, MSN, and DNP 5000 level courses.)

At least 15 Graduate Credit Hours must be taken at the 7000 level for a specialist degree, unless written approval is granted by the graduate student's advisory committee, department chair, and Dean of the College of Graduate Studies.

No Graduate Course below 6000 level will be counted toward a specialist degree unless written approval is granted by the graduate student's advisory committee, department chair, and the Dean of the College of Graduate Studies.

A non-degree graduate student subsequently admitted into a graduate program may use up to nine (9) previously earned graduate Credit Hours toward the graduate program, upon approval from the graduate student's advisory committee.

All graduate coursework is part of the graduate transcript and all grades earned are part of the cumulative GPA. This applies to all Graduate Courses completed, even if the Graduate Courses are not part of the degree requirements.

A graduate student must achieve a Grade of at least "C" on all Graduate Courses taken, including those taken for non-degree purposes, Background Courses, Mandatory or Pre-requisite courses, licensure, certification, endorsement or personal enrichment.

A graduate student must achieve a Grade of at least "C" on all undergraduate courses listed on the Program of Study. All courses will appear at each respective Academic Course Level on the graduate student's transcript.

The University reserves the right to change course numbers and course descriptions after the date of publication of the catalog, or to decline to offer the course as described when circumstances warrant such action.

Tennessee Tech will grant credit toward a graduate program for any Graduate Course in which a graduate student earns a Grade of A, B, C, S, or SP toward the final approved Program of Study, unless otherwise required by a specific program. Tennessee Tech, however, will not accept more than six (6) Credit Hours of "C" earned toward any graduate program.

A graduate student may appeal an assigned Grade through Tennessee Tech Policy 218 (Grade Appeals Policy).

Grading

On September 1, 1951, the University adopted a 4.0 quality point scale, changing from the 3.0 scale.

Grading System

Grades are indicated by letters.

- A--Excellent
- B--Good
- C--Satisfactory
- D--Passing
- F--Failure
- I--Incomplete
- NF--Fail, Never Attended
- X--Absent from Examination
- W--Withdrew Passing
- WF--Withdrew Failing
- S--Satisfactory
- U--Unsatisfactory
- SP--Thesis (Satisfactory Progress)
- NP--Thesis (No Progress)

(NOTE: Only grades of A, B, C, S, and SP are considered satisfactory at the graduate level, with not more than two (2) grades of C allowed for graduate degree purposes.)

Grade Appeal Procedure

The university grade appeal procedure is outlined in Tennessee Tech Grade Appeals Policy #218.

Quality Points

Quality points are assigned to each semester-hour credit as follows:

- For a grade of A, 4 quality points
- For a grade of B, 3 quality points
- For a grade of C, 2 quality points
- For a grade of D, 1 quality point
- For grades of F, I, X, NF, W, S, SP, NP, U, and WF, no quality points.

Quality Point Average

The quality point average for the semester is determined by dividing the total quality points earned by the total semester hours attempted (excluding courses in which grades of I, W, S, SP, NP, and U were earned). The

cumulative quality point average is determined by dividing the total quality points for all semesters by the cumulative hours (excluding courses in which grades of I, W, S, SP, NP, and U were earned). Noncredit courses are disregarded in computing the quality point average.

When a course is repeated, the grade on repeated work as well as the original grade will be included in calculation of the quality point average. Credits attempted with a grade of I, W, S, NP, and SP are disregarded, but credits attempted with grades of X, WF, NF, and U are counted as F's.

Grade of I (Incomplete)

An instructor may assign an "I" Grade when a student's performance has been satisfactory, but for reasons beyond the student's control, they have not been able to complete the Graduate course requirements within the allotted time.

When a Grade of "I" is assigned, the graduate student will not be required to register for the Graduate course again but must complete the original course requirements with the original instructor, if applicable.

Upon approval of the instructor, the graduate student has up to one (1) calendar year or until the time of graduation, whichever comes first, to remove the "I".

Completion of a Graduate course with a Grade of "I" does not count toward enrollment hours.

The "I" is excluded from the calculation of the graduate student's Current GPA and Cumulative GPA until a Grade is earned.

If the "I" is not removed within the established time limits, it is automatically changed to a Grade of "IF". The Grade of "IF" will remain on the student's academic record permanently and will be included in the Cumulative GPA. A Graduate student cannot graduate with an "I" on their record.

Quality of Work

Required QPA

A graduate student is required to maintain a cumulative grade average of at least B (3.0) on all courses taken for degree purposes. Credit toward a degree objective will be granted for any graduate course in which a grade of A, B, C, S, or SP (for thesis or dissertation) is assigned; however, not more than six (6) hours of C credit will be accepted. If a grade of D, U, F, IF, FA, WF, or NF is assigned in a degree-related course, the course must be repeated; and both the original grade and the grade for the repetition will be counted in the cumulative average.

M.B.A. Requirements

An MBA student is required to maintain a cumulative grade average of at least B (3.0) on all courses taken for degree purposes, and must achieve a grade of B or better in BMGT 6950. Students must repeat BMGT 6950 until a grade of B or better is obtained. Other courses may be repeated at the discretion of the student, and both the original grade and the grade for the repeat will be counted in the cumulative average. Any student receiving a D or an F in an MBA degree course shall be dismissed from the program.

Nursing Requirements

Student Retention and Progression Criteria

Required GPA

1. Students in graduate nursing programs must meet the requirements of the College of Graduate Studies to remain in good standing. An overall grade point average (GPA) of 3.0 (B) or better must be maintained in order to graduate. Only grades of A, B and S are considered satisfactory in the graduate nursing level;
2. In addition, a graduate nursing student must achieve a grade of "B" or better in every graduate nursing course. Policies of the College of Graduate Studies for progression will apply.

3. MSN students who earn less than a "B" in a required course will have one opportunity to repeat the course. The course must be repeated at the next available opportunity. Students may only repeat two required courses. The repeated grade and the original grade will be averaged into the student's overall GP A.
4. If a student's cumulative grade point average falls below 3.0, she/he will be placed on academic probation at the end of that semester. Any graduate student placed in probationary Academic Standing at the end of a semester must return to Good Academic Standing by the end of the next enrolled semester. No student will be allowed more than two probationary semesters, whether consecutive or cumulative. At the end of a second probationary semester, a student whose cumulative grade point average is still below 3.0 will be dismissed from graduate study.
5. Students whose performance results in a GPA so far below 3.0 as to make it mathematically impossible to attain an overall GP A of 3.0 after one semester may be subject to dismissal without a probationary term.
6. An incomplete grade ("I") indicates that the student was passing the course at the end of the semester, but due to circumstances beyond the student's control, was unable to complete the course work for which the "I" is assigned. The "I" grade cannot be used to allow a student to do additional work to raise a deficient grade or to repeat a course. An "I" grade must be removed no later than one calendar year from the time the grade is awarded. Students with more than one "I" grade cannot progress in the program. Time extension requests for removal of an "I" grade must be submitted to and approved by the Dean of College of Graduate Studies before the allotted time expires. An "I" grade not removed under the guidelines in the Graduate Catalog will be converted to an "F."

Progression:

Students must report the following to the Dean of the Whitson-Hester School of Nursing (WHSON) within 72 hours of change of status or requirement:

1. Any adverse action taken against their RN licensure (i.e. probation, termination, suspension, limiting scope of practice, any change in activity);
2. Placement in the Tennessee Peer Assistance Program (TNPAP) or any other peer assistance program;
3. Admission to a substance abuse rehabilitation program;
4. Any legal issues that may result in a change in their ability to pass a criminal background check, including but not limited to arrests or convictions (see University's Arrest and Conviction Self-Disclosure form ([link](#))) or change of status legal status with regards to probation or parole.

Failure to disclose to the WHSON could result in automatic dismissal from the MSN program. In addition, student must disclose the same information to preceptors and clinical agencies and provide appropriate documentation of this disclosure to WHSON.

Graduate Assistant GPA Requirements

A graduate assistant is required to maintain a minimum quality point average of 3.0 each semester. Upon the recommendation of the appropriate departmental chairperson and academic dean, the student may be permitted to retain the assistantship on probation for one (1) semester should the average fall below the minimum requirement.

Background Courses

Additionally, a graduate student must achieve a grade of at least C on each course taken for nondegree purposes, that is, courses taken for background preparation, certification, or personal enrichment. A student will be required to repeat each nondegree course in which a grade of D, U, F, WF, or NF is assigned except that, with approval of the student's advisory committee, repetition of a course will not be required if a student's cumulative grade average on all courses (degree and nondegree) is at least B (3.0).

Probation for Unsatisfactory Performance

A graduate student is required to maintain a cumulative grade point average of at least "B" on all graduate courses taken as a graduate student. When a student's cumulative average on courses falls below 3.0, but not less than 2.00, the student will be placed in probationary Academic Standing. If the cumulative average falls below 2.00, the student will be dismissed.

Any graduate student placed in probationary Academic Standing at the end of a semester must return to Good Academic Standing by the end of the next enrolled semester.

If the term average, on all courses presented as part of the hours required for graduation, during any semester is less than 2.00, the student's record will be reviewed and may be placed on probation.

Dismissal for Unsatisfactory Performance:

A graduate student will be dismissed from the graduate program if any one of the following conditions occurs:

1. The graduate student's current GPA or cumulative GPA falls below 2.0.
2. The student earns two Grades of "F",
3. Two consecutive semesters of "No Progress" grades assigned in thesis or dissertation courses.
4. Two "C" grades in the Ph.D. in Exceptional Learning Program.
5. One "F" grade in a course in the Ph.D. in Exceptional Learning Program.
6. Some graduate programs may have more stringent dismissal criteria. Students should confer with the department about such criteria.
7. The graduate student fails to achieve Good Academic Standing by the end of the next enrolled semester following a semester that the graduate student was placed in probationary Academic Standing
8. The graduate student fails to meet program-specific requirements.
9. The graduate student does not successfully pass all examinations for admission to candidacy as required by their graduate program.

A graduate student who has been dismissed for unsatisfactory performance may request reinstatement through the appeal procedures in Tennessee Tech Policy #281 (Graduate Student Dismissal, Reinstatement, and Appeal Procedures).

<https://tntech.policytech.com/>

Permissible Loads

Nine (9) credit hours in the fall or spring semester constitutes a full load for a graduate student. During the Summer Semester, a full load is six (6) hours taken in the 1st term, 2nd term, or a combination of both terms. The maximum permissible load is 16 credit hours per semester, inclusive totals of all credits earned at all institutions. Tennessee Tech Policy 274 (Graduate Assistantship), describes Graduate Course load limits for graduate assistants.

Permissible Loads of International Students

Each semester, except summer, an international graduate student must earn a minimum of nine (9) credit hours if a Master's student and six (6) credit hours if a PhD student. In the event that an international graduate student attending TTU on an F-1 Visa has not attended another F-1 certified school continuously for one academic year (30 weeks) the student will be required to enroll in the summer term as a full-time student (3 hours non-online

coursework). However, if the student's department chair determines that appropriate courses are not available during the summer term, the student is not required to enroll as described above. Documentation stating the lack of appropriate course availability should be maintained in the student's immigration file. Tennessee Tech Policy 240 (Full Course of Study Requirements for International Students), describes Graduate Course load minimums for international graduate students. Tennessee Tech Policy 274 (Graduate Assistantship), describes Graduate Course limits for graduate assistants.

Permissible Loads of Graduate Assistants

To receive and maintain full-time graduate student status, a graduate assistant must meet the following registration requirements:

- For the summer semester, a Graduate Assistant must register for a minimum of one (1) credit hour but not more than twelve (12) graduate credit hours.
- For the fall and spring semesters, a Graduate Assistant must register for a minimum of six (6) credit hours but not more than twelve (12) graduate credit hours.

A graduate assistant is classified as an in-state resident ONLY while working as a graduate assistant. Classification status will be reverted back to out-of state when the assistantship ends.

Definition of Credit Hour

Tennessee Technological University is organized on the semester basis. When the term *hour* or *credit* is used, it refers to a semester-hour credit. One semester hour of credit requires one hour (55 minutes) of classroom or direct faculty instruction and a minimum of two hours out-of-class student work each week for approximately fifteen weeks.

Two or more hours of laboratory or studio work are required per hour of credit. An equivalent amount of work is required for practica and other academic activities that award credit. Summer, intersession or other alternate course formats require the equivalent amount of work per credit hour. Laboratory hours per credit are determined by the department or college. Semester credit hours earned in courses such as internships, research, theses, dissertations, study abroad, etc. are based on outcome expectations established by the academic program.

Change of Major

A student is admitted to a degree program only upon a declaration of a major area of study. The student may change their major area of study only if the department of the new major admits the student. The student must complete the Change of Major form (www.tntech.edu/graduatestudies/forms) and forward to the College of Graduate Studies.

Course Repetition Policy

A course repetition is required for all Graduate Courses in which a Grade of D, U, X, IF, F, FA, WF, or NF is earned. Both the original Grade and the Grade for the repetition will be counted in the Cumulative GPA.

Each graduate program in which Graduate Course repetition is permitted is limited to one (1) repetition per Graduate Course.

Unless defined otherwise by the program, a student must repeat any "C" grade earned beyond 6 credit hours of "C" on graduate level courses.

The cumulative Graduate Course repetition cannot exceed nine (9) Credit Hours in any graduate program.

Some Graduate Courses that share the same prefix and number are permitted to be taken more than once for credit and are not considered repetition due to the change in Graduate Course material. These types of Graduate Courses are noted in Course Descriptions.

University Policies

Student Responsibility

All students are required to have knowledge of rights, responsibilities, and regulations pertaining to campus life which are published in the *Student Handbook*. Each student is responsible for maintaining communication with the University, by keeping officials informed at all times of current address (including zip code) and telephone number.

Students are responsible for the proper completion of their academic programs; for familiarity with requirements of the University Catalog; for maintaining the grade average required; and for meeting all other degree requirements. A student may receive counsel from an academic advisor; however, the final responsibility remains that of the student.

The course offerings and requirements of the institution are continually under examination and revision. This catalog (bulletin) presents the offerings and requirements in effect at the time of publication, but is no guarantee that they will not be changed or revoked. However, adequate and reasonable notice will be given to students affected by any changes. This catalog (bulletin) is not intended to state contractual terms and does not constitute a contract between the student and the institution. The University reserves the right to make changes in rules and regulations concerning admission, student conduct, degree requirements, and course descriptions subject to the concurrence and approval of its governing authorities.

The institution reserves the right to make changes as required in course offerings, curricula, academic policies, and other rules and regulations affecting students to be effective whenever determined by the institution. These changes will govern current and formerly enrolled students. Enrollment of all students is subject to these conditions.

The University provides the opportunity for students to increase their knowledge by providing programs of instruction in the various disciplines and programs through faculty who, in the opinion of the University, are qualified for teaching at the college level. The acquisition and retention of knowledge by any student is, however, contingent upon the student's desire and ability to learn and his or her application of appropriate study techniques to any course or program. Thus, the University must necessarily limit representation of student preparedness in any field of study to that competency demonstrated at that specific point in time at which appropriate academic measurements were taken to certify course or program completion.

The regulations and policies established by the Graduate Studies Executive Committee are intended to provide guidance to faculty and students. Should an individual believe that there is sufficient justification for an exception to any requirement, written requests (with any suitable statements or other supporting documents) may be submitted to the Associate Dean of Graduate Studies for consideration by the committee. The committee has regular meetings three times during each semester of the academic year and once during the summer.

The graduate catalog is a supplement to the undergraduate catalog (general catalog) and is published to provide information for graduate students, prospective graduate students, and members of the faculty. Students enrolling for graduate study at Tennessee Technological University are responsible not only to the provisions of the graduate catalog but also to the undergraduate catalog. Whenever a student's welfare or progress may be impeded or impaired by any conflict of information presented in the two (2) publications, resolution of such conflict will be determined by the appropriate standing committees of the University. When a person is admitted to graduate study, it is presumed that person accepts responsibility for learning and observing the regulations and policies of the University; therefore, ignorance of a regulation or policy does not constitute a basis for waiving that regulation or policy. Graduate students are subject to the usual procedures and regulations of the University as listed in the undergraduate catalog, except as they apply to undergraduate students only.

Tennessee Technological University is an Equal Opportunity/Affirmative Action institution and is in compliance with Titles VI and VII of the Civil Rights Act of 1974, Title IX of the Education Amendments of 1972, the Age Discrimination Act of 1974, the Rehabilitation Act of 1973, Vietnam Era Veterans Readjustment Act of 1974, and The Americans With Disabilities Act of 1990. The University is nondiscriminatory on the basis of age, race, color, religion, sex, national origin, disability status, or status as a disabled veteran or veteran of the Vietnam Era.

Disability Accommodation

Students with a disability requiring accommodations should contact the Office of Disability Services (ODS). An Accommodation Request (AR) should be completed as soon as possible, preferably by the end of the first week of

the course. The ODS is located in the Roaden University Center, Room 112; phone 372-6119. For details, view the Tennessee Tech's Policy 340 – Services for Students with Disabilities at [Policy Central](#).

Official Notice to Report

A notice to report to any administrative office of the University takes precedence over all noninstructional activities, and must be answered immediately or, if received during a class, as soon as the class is over. Failure to respond to such a notice will require satisfactory explanation to the Administrative Council before the student is allowed to continue in residence.

Student Academic Misconduct

Maintaining high standards of academic integrity in every class at Tennessee Tech is critical to the reputation of Tennessee Tech, its students, alumni, and the employers of Tennessee Tech graduates. The Student Academic Misconduct Policy describes the definitions of academic misconduct and policies and procedures for addressing Academic Misconduct at Tennessee Tech. For details, view the Tennessee Tech's Policy 217 – Student Academic Misconduct at [Policy Central](#).

Grade Appeal Procedure

The university grade appeal procedure is outlined in Tennessee Tech Policy 218.

Judiciary Procedures

Judiciary procedures at the University do not constitute legal actions, and the decisions are not to be equated with verdicts reached by courts of law. These procedures simply involve the fact-finding and decision-making processes of an educational institution.

Detailed procedures for the disciplinary system are printed in the "Disciplinary System Manual." Copies of the manual are located in the Office of Student Affairs.

Unofficial Withdrawal

Tennessee Technological University will, through forms of documentation deemed acceptable by federal guidelines, determine the date of unofficial withdrawal for any student who leaves the University without officially withdrawing. In compliance with federal guidelines this date will be used to calculate the University's financial liability to the federal government in the recovery of funds.

Official Withdrawal From The University

Students who desire to withdraw from the University before the end of an academic term must make formal application for withdrawal either in the Office of Student Affairs at the time of withdrawal. Those who complete withdrawal procedures will receive a grade of W in courses they are passing and a grade of WF in courses they are failing if official withdrawal is after the last date for dropping a course. Refunds which may be due will depend upon the date of formal withdrawal. Applications for withdrawal will not be considered if received after final examinations begin in any term.

Privacy Rights Of Students

On May 20, 1975, Tennessee Tech approved a statement of policy that includes provisions for the release of information about students and the rights of students and others to have access to Tech's education records. The complete policy statement of "Privacy Rights of Students" is available in the Records and Registration Office and in the Student Handbook.

A student may obtain a transcript of his or her academic records by making a written request to the Office of Records and Registration, Tennessee Technological University, P. O. Box 5097, Cookeville, TN 38505, fax (931) 372-6111.

Drug Free Policy

The Tennessee Technological University community (Faculty, Staff, and Students) complies with the policies and penalties relative to controlled substances (illicit drugs) and alcohol, as required by the Drug Free Workplace Act of 1988 and the Drug Free Schools and Communities Act Amendments of 1989. As an employee and/or student at Tennessee Technological University, you are required to be knowledgeable of and comply with the Drug Free Campus/Workplace Policy, the applicable provisions of which are summarized below:

It is the policy of this institution that the unlawful manufacture, distribution, possession, use, or abuse of alcohol and/or illicit drugs on the Tennessee Technological University campus or on property owned or controlled by the University is strictly prohibited. All categories of employees and students are subject to this policy and to applicable federal, state, and local laws related to this matter. Additionally, any violation of this policy will result in disciplinary actions as set forth in the applicable sections of this policy.

No Smoking & Tobacco-Free Campus Policy

Tennessee Tech University (TTU) agrees with the U.S. Surgeon General that tobacco use in any form, active and/or passive, is a significant health hazard. TTU further recognizes that environmental tobacco smoke has been classified as a Class-A carcinogen, and that the State of Tennessee is actively dissuading its employees from smoking. TTU supports the American College Health Association Position Statement on Tobacco on College and University Campuses (www.acha.org, Feb 2005). Due to these health risks, TTU has adopted a NO SMOKING & TOBACCO-FREE CAMPUS policy.

7.1 Policy - Effective January 1, 2010, TTU is a No Smoking & Tobacco-Free Campus, with all smoking ('herbal' and tobacco) and all other tobacco usage permitted only in private vehicles. This policy applies to all university buildings and grounds; TTU-affiliated off-campus locations and clinics; and any buildings or properties owned, leased or rented by TTU in all other areas. Smoking and tobacco use continues to be prohibited in all state vehicles. This No Smoking & Tobacco-free Campus Policy is in effect 24 hours a day year-round.

Background - The University promotes a healthy, sanitary environment free from all smoke ('herbal' and tobacco) and tobacco-related debris. The TTU community acknowledges that long-term health hazards may accrue to people who use tobacco products or who are subjected to second-hand smoke. The failure to address the use of tobacco products on campus would constitute a violation of the Americans with Disabilities Act, the Vocational Rehabilitation Act and Tennessee law.

Support - Understanding the addictive nature of tobacco products, TTU will make every effort to assist those who may wish to stop using tobacco. TTU Human Resources, Health Services and Counseling Center offer current information about available resources. The State offers toll-free assistance at 1-800-QuitNow (1-800-784-8669). The American Cancer Society offers free counsel to individuals wanting to quit.

7.2 Compliance and Enforcement - It is the responsibility of all members of the TTU community and visitors to comply with this no smoking and tobacco-free campus policy. Violations of the policy will be dealt with in a manner that is consistent with university procedures. There shall be no reprisals against anyone reporting violations of this policy.

Inclement Weather Policy

All Tennessee Technological University offices will remain in operation during inclement weather to ensure continuity of services and to meet the needs of our students. In extreme weather conditions, classes and exams on campus and at off-campus locations may be rescheduled or cancelled while the university is open.

In accordance with TTU policy, faculty, administrators and staff of TTU are expected to make every reasonable effort to be at their work assignment on time, taking into consideration the personal risk involved. Administrators or staff employees who anticipate arriving late, or not arriving at work at all, should notify their immediate supervisor of this fact as soon as possible and request annual leave for the period of absence. If faculty members must be absent from assigned classes due to inclement weather, it is their responsibility to notify the appropriate chairperson and/or dean.

Off-Campus Classes

28.1.2 The decision to cancel off-campus classes will be made by the Vice President for Academic Affairs in close consultation with the Vice President of Extended Programs and Regional Development and the coordinators of the off-campus centers. The information will then be disseminated by the coordinators as quickly as possible by whatever means are available in the vicinity of the affected center.

For Employees / Working Hours

At times it may be necessary for the President to declare specific hours as emergency closing as the result of inclement weather or other emergency situations. In such cases, regular full-time and part-time employees on the active payroll who are scheduled to work during the declared times of closing will be granted time off from work with pay. Employees who are not scheduled to work will not be paid for the emergency closing. Clerical and support personnel required to work to keep essential services functioning will receive extra compensation. Administrative personnel required to work will receive equal time off for hours worked.

Academic Work

If classes are canceled due to inclement weather, missed classes should be made up in a manner chosen by the individual faculty member involved. If classes are not cancelled despite inclement weather, students are responsible for any academic work they miss as a result of inclement weather. It is the individual student's responsibility to take the initiative in making up any missed work, including but not limited to examinations, presentations and projects, and it is the faculty member's responsibility to provide the student with a reasonable opportunity to make up missed work, including but not limited to examinations, presentations and projects.

Delays & Early Closings

The President of the University may choose a delayed opening or early closing.

In the event of the delayed opening, all faculty and staff are expected to report to their specific work location by the set opening time. Students are expected to report to regularly scheduled class only if there are 30 or more minutes remaining in the session. (Ex.: If the delayed opening is set for 10:00 a.m., students who have classes from 9:30 a.m. to 10:50 a.m. should report to that class at 10:00 a.m.). All classes scheduled prior to the delayed opening time and those that have less than 30 minutes remaining after the set opening time are cancelled for the day.

When time is announced for an early closing, it applies to all classes that begin on or after that hour. Ex. "Classes cancelled at 3 p.m." means all classes starting at 3 p.m. or later are cancelled. Classes that started before 3 p.m. will meet.

Procedures for Canceling Classes

In those instances when weather conditions require a decision by the President of the University to authorize canceling classes, delaying the start of classes or suspending selected activities, the following procedures will be in effect:

28.2.1 The Director of Facilities and Business Services and Director of Safety and Environmental Services will monitor official weather reports, contact appropriate state, county and local Public Safety Officials and check local roads for hazardous driving conditions. They will review campus roads, walkways and parking lot conditions. The Director of Facilities and Business Services will advise the Vice President for Business and Fiscal Affairs of the findings. After receiving this information, the Vice President for Business and Fiscal Affairs will inform the Vice President for Academic Affairs, who will consult with the other vice presidents and recommend to the President whether the University should cancel classes or declare an emergency closing. If the Vice President for Business and Fiscal Affairs is unavailable, the Director of Facilities and Business Services and Director of Safety and Environmental Services will contact the Vice President for Academic Affairs.

Once the decision is made to cancel classes or close offices and facilities or buildings on campus or at extended education sites, the President or Vice President for Academic Affairs will notify:

- Associate Vice President for Communications and Marketing (or representative of that office)
- TTU Police
- University Vice Presidents (Each University Vice President will be responsible for notifying the appropriate personnel in the division).

The Office of Communications and Marketing will prepare an official statement and notify the campus community and public through the following ways:

- University website homepage
- Broadcast e-mail to students, faculty and staff
- Text alert (written by OCM, distributed by University Police)
- Facebook and other social media
- Switchboard operator
- Local media (including Channel 7)
- Metro Nashville network TV stations and select radio stations
- Upper Cumberland Radio
- Campus media (Oracle/WTTU)
- Metro Knoxville network TV stations and select radio stations

Many media outlets require private passwords or codes for weather notifications. These codes will be kept confidential and maintained annually by the Office of Communications and Marketing. Access to a listing of codes will be limited to designated OCM staff members and the Vice President for University Advancement.

No notice will be sent to media if the University continues to operate on a normal schedule. (The University homepage and social media may be used to communicate to students, parents, faculty, staff and administrators that a normal schedule will be followed).

Graduate Academic Fresh Start

Graduate Academic Fresh Start is a plan of academic forgiveness provided for graduate students who have gained maturity in learning through extended experience outside higher education institutions. The Academic Fresh Start allows the calculation of the quality point average and credit hours toward graduation to be based only on work done after returning to college under the Academic Fresh Start program.

Individuals interested in requesting a Graduate Academic Fresh Start must submit a completed application (www.tntech.edu/graduatestudies/forms) to the College of Graduate Studies, including a written justification for the request.

A Graduate Academic Fresh Start request is limited to situations where the individual wishes to apply to a graduate degree program other than the previously attempted coursework.

An individual seeking a Graduate Academic Fresh Start must:

1. Submit a completed change of major form to the College of Graduate Studies.
2. Submit all admission documents as required by Tennessee Tech Policy 270; and
3. Meet all the requirements for admission as determined by the program and the College of Graduate Studies.

The approval of a request for a Graduate Academic Fresh Start is at the discretion of the department and academic dean for the program to which the individual is applying and the Dean of the College of Graduate Studies.

An individual may receive only one Graduate Academic Fresh Start.

Previous coursework will not be used to satisfy the requirements of the new degree program.

Student Complaint Procedures

Students or prospective students who wish to file a complaint related to accreditation or regarding violations of state law not resolved at the institution may do so by following the Student Complaint Policy and Procedure at <https://www.tnitech.edu/studentaffairs/stucomplaint/>.

Complaints regarding accreditation can also be made by contacting the Southern Association of Colleges and Schools Commission on Colleges, 1866 Southern Lane, Decatur, GA 30033-4097, telephone: 404-679-4500 (www.sacscoc.org).

Complaints of fraud, waste or abuse may be made by email at reportfraud@tbr.edu or by calling the Tennessee Comptroller's Hotline for Fraud, Waste and Abuse at 1-800-232-5454.

Degree Requirements

General Degree Requirements

Time Limits on Completion of Requirements

A graduate student in a master's or specialist program must complete all degree requirements within six (6) consecutive years. A graduate student in a doctoral program must complete all requirements within eight (8) consecutive years. Time limits shall be computed from and including the first semester the student is admitted and enrolled in a degree program.

All Graduate Courses (both TTU and transfer credit) earned toward a graduate program must be taken within the applicable time limit. Courses that exceed the time limit must be validated for currency.

Course Validation

Tennessee Tech courses will be reviewed for current content at the home department where the course is offered. Courses taken outside of TTU will be reviewed for current content at the discretion of the department. The department will notify the College of Graduate Studies (via the Course Validation form) regarding the results of course content review and validation. Validated courses will not have to be reviewed again during the remaining time limit associated with the degree program.

Advisory Committee

A graduate student is required to have an advisory committee and is responsible for its formation and maintenance. Several programs have a designated "standing advisory committee." TTU Policy 271 provides details on the composition of the student's advisory committee. All requirements related to advisory committee responsibility as defined in Tennessee Tech Policy 282 (Graduate Faculty Appointment and Responsibilities Policy) must be met, except as provided in this section;

- Unless a specific graduate program has direct oversight by a standing advisory committee, all graduate degree programs must follow the committee formation requirements.

- In consultation with their advisor, a graduate student is required to establish their advisory committee and should submit the Advisory Committee Form to the College of Graduate Studies by the completion of 15 semester hours.
- The graduate student, in consultation with the departmental chairperson or graduate student's academic advisor, will determine the formation of the graduate student's advisory committee as part of the Program of Study.
- A minimum of three (3) advisory committee members is required for a master's or specialist degree program.
- A minimum of four (4) advisory committee members is required for a doctoral program in Education.
- A minimum of five (5) advisory committee member is required for a doctoral program in Engineering and Environmental Sciences.
- A graduate student's advisory committee members shall represent each of the areas in which the graduate student expects to study, with two (2) members having background in the major area. The graduate student must have at least one (1) committee member with adequate background and research interests in the area in which the student has proposed a research objective.
- A faculty member has the prerogative of accepting or relinquishing an appointment on a graduate student's advisory committee.
- Professionals who are not employed by Tennessee Tech may serve as a consultant on a graduate student's committee if appointed pursuant to Policy 282 (Graduate Faculty Appointment and Responsibilities).
- Approval requirements are as follows:
 - Three (3) positive votes, or seventy-five percent positive votes, whichever is greater, is required from the advisory committee members of a graduate student pursuing a master's or specialist degree.
 - A minimum of eighty percent positive votes is required from the advisory committee members of a graduate student pursuing a doctoral degree in Engineering or Environmental Sciences.
 - The advisory committee must vote unanimously positive for a graduate student pursuing a doctoral degree in Education.
 - In the event a student does not meet the required number of votes for approval, the student may appeal to the dean of the college in which they are enrolled. The college dean may assign a subcommittee to review the appeal. However, the decision from the dean of the college is final.
- The graduate student is responsible for submitting to the College of Graduate Studies any change in advisory committee.

Program of Study

Following admission into a graduate degree program, a graduate student will work with their academic advisor and committee members to determine the specific courses needed to fulfill their degree requirements.

Comprehensive Examination

At or near the completion of the course requirements for the graduate degree, each candidate must pass a comprehensive examination conducted by the candidate's graduate advisory committee. The examination may be oral or written or both. In the examination the student should demonstrate the breadth of knowledge in the discipline, depth in specific areas, and the ability to integrate what has been learned. The following degree programs have a capstone course in which the final course completion is used in place of the comprehensive examination.

- Curriculum and Instruction, and Instructional Leadership (M.A. and Ed.S.) completion of CUED 6305 or CUED 6315 or CUED 7910
- Exercise Science and Wellness (M.A.) completion of EXPW 6550
- Electrical Engineering non-thesis completion of final project course, ECE 6970
- Masters of Business Administration completion of BMGT 6950
- Masters of Nursing completion of NURS 6990
- Masters of Professional Studies completion of PRST 6998
- Mechanical Engineering non-thesis completion of final project course ME 6900

- Professional Science Masters completion of ESS 6910

Thesis/Dissertation Defense

Serving as a comprehensive examination for students pursuing a thesis track master's or doctorate, a formal defense of the thesis or dissertation is required. Scheduling of the defense is the candidate's responsibility. The defense will be attended by the candidate's advisory committee and other designees as the individual degree defines.

Application for Graduation

In addition to satisfying all degree requirements, a candidate for a degree must file an Application for Graduation one semester prior to the semester in which the degree is expected to be conferred. The deadline for the filing of the application is posted on the College of Graduate Studies website each semester.

A graduate student shall be enrolled for a course approved by the graduate advisor during the term in which the degree is awarded unless all requirements have been completed by the last day to register for the term. Any prior courses with a grade of "I" do not count toward enrollment hours.

If a student applies for graduation but fails to satisfy graduation requirements, the student must reapply; this must be done by the date appearing in the online calendar.

All final degree requirements for graduation must be filed in the Graduate Studies Office no later than one (1) week prior to commencement, with the exception of the defense form and comprehensive exam form which are due three (3) weeks prior to commencement. Transcripts from other universities used as transfer credit on a program of study must be received no later than two (2) weeks after the commencement date.

The advisory committee approved copy of the thesis/dissertation must be submitted through the ETD Administrator (ProQuest) for format review no later than two (2) weeks prior to commencement. The final copy for publication through ProQuest must be submitted via the ETD Administrator one (1) week prior to commencement.

Commencement

There will not be a commencement ceremony for those graduating in August. Students who wish to participate will be allowed to return to the University for the December commencement ceremony. Exceptions may be made to this policy for extenuating circumstances. Students requesting to walk in a commencement other than the semester that the degree is conferred, are required to request prior-approval. An "Exception to Walk in Commencement" should be filed by the student (the form may be found on the ONLINE Forms page of the Graduate College website) at least four weeks before the end of the semester. The completed form is to be electronically signed by the student's advisor, department chair, and the Dean of the College of Graduate Studies. Students may participate in only one (1) commencement ceremony for each degree earned at Tennessee Tech University.

Master's Degree General Requirements

Programs of Study

Programs of study toward advanced degrees are less formal than for undergraduate degrees. Individual programs are planned for each student on the basis of educational background and career objective. Graduate degrees are not only awarded on the basis of completion of specific courses, but also on the basis of evidence of proficiency, scholarship, reasoning and investigation, and high attainments in the field of the student's specialization.

Although the maximum number of credits required in any degree program is determined in accordance with the formalized program approved for each student, in accordance with SACSCOC Standard 9.2, a candidate for the master's degree must complete at least 30 semester hours of credit for a master's degree. Program requirements for certificates, master's, post-master's certificate, specialist, and doctoral programs are defined by the college and department offering the program. Some college and department graduate programs may have requirements for continuation or graduation in addition to the minimum requirements set forth in this catalog. It is the graduate

student's responsibility to be familiar with specific requirements found in their college and department program information.

At least seventy percent of the credit to be counted toward a master's degree must be at the 6000 level or above. In addition to the minimum course credits required for the advanced degree, other courses may be required as prerequisites depending upon the student's educational background, preparation, and objectives; however, credit earned below the 5000 level will not be counted toward a graduate degree. Courses listed as 4000 (5000) may be taken only at the 5000 level for graduate credit, and graduate credit is earned on the basis of additional work required by the instructor. Courses taken at the 4000 level may not later be taken at the 5000 level without special permission from the departmental chairperson, dean of the college, and the Associate Dean of Graduate Studies. Credit earned for one (1) degree program cannot be used in another degree program.

Any non-thesis program which is considered for approval by the Graduate School Executive Committee must demonstrate that it fosters independent learning.

A student desiring to pursue study for the master's degree in a field which may be different from the field of his undergraduate degree, and in which the necessary prerequisites are lacking, may do so by including in the program of study (as background courses) all the necessary undergraduate prerequisites for the area of specialization in addition to the required number of hours for the degree.

Each proposed program of study must be approved by the student's advisory committee, the departmental chairperson, and the Associate Dean of Graduate Studies.

Admission to Candidacy

Graduate students in a program leading to the master's degree, except those in Special Standing, should make application for admission to candidacy immediately following the completion of nine (9) semester hours of graduate credit. If application is not made by the time 15 hours are completed, the student may not be permitted to register for subsequent work until the application is approved. The requirements which must be met before approval of admission to candidacy are:

1. the achievement of Full Standing.
2. the completion of at least nine (9) semester hours of graduate credit with a minimum quality point average of 3.0.
3. the written approval by the student's advisory committee.
4. the written approval of the chairperson of the major department.
5. successful completion of any examination which may be required by the student's department.

If the student's application for admission to candidacy is not approved due to academic deficiencies, the student cannot continue graduate study with a major in any of the departments of the college in which he/she is studying.

Credit Requirements

As stated above, in accordance with SACSCOC Standard 9.2, a candidate for a master's degree must complete at least 30 semester hours of credit for the master's degree.

At least 21 semester credits including the thesis shall be required at the 6000 level or above in a 30-hour program for the master's degree; at least 23 semester credits at the 6000 level or above shall be required in a 33-hour master's program. The remainder of the courses in the program of study may be at the 5000 level; however, not more than 30% of the courses in a student's program of study may be in dual numbered 4000 (5000) courses. Courses below the 5000 level will not be counted toward a graduate degree; and, although they may appear on the written program as background requirements, these courses are not figured into degree requirements.

Requirements for a Major

A student's program of study must reflect a reasonable concentration in related or interrelated courses. A department may require that all of the courses in a student's program be taken in that department; or it may require that a major portion be taken in that department and allow for one or more minor areas of collateral study in other departments.

Transfer and Other Credit

Students who request to transfer graduate course credits from an accredited institution to Tennessee Tech must request that the institution send official transcripts directly to TTU. Official transcripts must include all grades.

The program department will determine, at its sole discretion, what transfer coursework is eligible for transfer to the student's program of study.

The coursework transferred or accepted for credit toward a graduate degree must have a minimum grade of "B" in each course.

For all graduate degree programs, the department will determine, in its sole discretion, the number of transfer credits it will accept, provided the department's decision is in compliance with SACSCOC Accreditation Standard 3.6.3.

Tennessee Tech will exclude grades earned in transferred courses in the calculation of grade point averages.

Tennessee Tech Policy #283 (General Graduate Transfer Credit Requirements) provides additional information on Transfer Credit.

Thesis

When a thesis is required in a student's program of study, no fewer than six (6) credit hours for Graduate Course 6990 (Master's thesis) will be counted towards the degree. Thesis (and dissertation) credit is made available in increments of 3, 6, or 9 semester hours during any given semester (and in some departments as one [1] hour credit). A graduate student shall be required to be registered for at least one (1) course appropriate to the student's degree objective in order to have access to computer equipment, laboratories, library, and other university facilities and resources even if the student is working in absentia on research and thesis. A graduate student shall be enrolled during the term in which the degree is awarded. When a student makes satisfactory progress in research and thesis, a grade of SP (Satisfactory Progress) will be assigned for credit earned. When satisfactory progress is not achieved, a grade of NP (No Progress) will be assigned; however, a grade of NP shall not be counted as having satisfied either program or degree requirements, and the student must register again for additional thesis (or dissertation) credit. Only grades of SP and NP shall be used to indicate a student's progress in thesis or dissertation credit.

Thesis Preparation:

The College of Graduate Studies requires all graduate students to follow the "Guide to the Preparation of Theses and Dissertations" that is published on the College website. The College of Graduate Studies will review the graduate student's thesis for formatting to ensure the thesis adheres to the Guide. The College will not review the paper's content, spelling, or accuracy of the citation.

Once the graduate student's advisory committee certificate approval page has been submitted to the College of Graduate Studies, the graduate student must submit the thesis electronically (through eTD ProQuest) to the Graduate School at least two (2) weeks prior to the close of the semester in which the degree is to be conferred (or at an earlier date if such is specified in the University calendar). Refer to the College of Graduate Studies website regarding requirements for electronic submission. Any thesis/dissertation that does meet the required standards will be returned to the student who will have one (1) week maximum to make corrections and resubmit. Failure to do so will result in ineligibility for graduation. All theses/dissertations that meet the required standards will be forwarded on for publication and the student will be eligible for graduation.

The graduate student's failure to complete the thesis review and formatting process with the College by the posted deadline on the College calendar, will result in the graduate student's ineligibility to graduate.

Thesis Defense:

A graduate student pursuing a thesis track master's will be required to participate in a formal defense of his/her thesis.

Prior to scheduling the thesis defense, the graduate student must submit the thesis certificate of approval page to the College of Graduate Studies for format review and approval.

The graduate student is responsible for scheduling his/her thesis defense with his/her advisory committee to allow enough time to submit the defense results to the College of Graduate Studies by the deadline established by the College. Failure to defend the thesis by the deadline will prevent graduation.

A graduate student's thesis defense is open to the public.

All the graduate student's advisory committee members are required to attend the thesis or dissertation defense.

Failure to submit the graduate student's thesis defense results to the College of Graduate Studies by the posted deadline on the College of Graduate Studies calendar will result in the graduate student's ineligibility to graduate.

Non-thesis

Most non-thesis graduate programs and some thesis graduate programs require that the graduate student successfully pass a Comprehensive Exam conducted by his/her advisory committee at or near the completion of his/her graduate program. Failure to submit the Comprehensive Exam results by the posted deadline on the College of Graduate Studies calendar will result in the graduate student's ineligibility to graduate.

Several non-thesis graduate programs have a capstone course or project course in which the final course completion is used in place of the Comprehensive Examination.

Any non-thesis program that comes before the Graduate School Executive Committee for consideration for approval must foster independent learning.

Second Master's Degree

A student holding an earned master's degree from Tennessee Tech or an accredited institution may qualify for a second master's degree by completion of graduate work approved by the graduate student's advisory committee, provided:

1. If the graduate student has previously earned a master's degree at Tennessee Tech then a minimum of 21 semester hours taken at Tennessee Tech must be completed for a thesis second master's degree or 24 semester hours if non-thesis.
2. If the graduate student has not previously earned a master's degree at Tennessee Tech, a minimum of 24 semester hours taken at Tennessee Tech must be completed for a thesis second master's degree or 27 semester hours if non-thesis.
3. The graduate student successfully completes all requirements prescribed in the specified graduate program.

Specialist in Education Degree General Requirements**Specialist in Education Degree**

The program of study leading to the Specialist in Education degree (Ed. S.) will be designed for each student so as to achieve proper balance between the experiences required for training as a specialist and those required for development as a professional educator working with other educators. The program will therefore be tailored to serve the needs and objectives of the individual student.

If a student lacks not more than 12 semester credits on the master's degree, the student may accumulate a maximum of 9 semester credits to be counted toward the Ed. S. degree provided the student (i) has been approved for tentative Ed. S. admission by the Graduate School, (ii) has a departmentally approved program of study, and (iii) fulfills all requirements for the master's degree within two (2) consecutive semesters.

A minimum of 30 semester hours beyond the master's degree, in approved upper-level courses, will be required in the Ed. S. program. At least 15 semester hours must be taken in courses numbered at the 7000 level and no course below the 6000 level shall be counted for credit unless written approval is obtained from the student's advisory committee, the chairperson of the department in which the student is majoring, and the Associate Dean of the College of Graduate Studies.

Although a thesis is not required in the specialist program, the student is expected to become well acquainted with research in the field of specialization and to demonstrate competence in research methodology. In order to satisfy these expectations, the student must earn at least three (3) semester hours in courses of a laboratory and/or field experience nature and three (3) semester hours in an independent study project.

Admission To Candidacy

Graduate students in a program leading to the Specialist in Education degree should make application for admission to candidacy immediately following the completion of fifteen (15) semester hours of graduate credit. If application is not made by the time 15 hours are completed, the student may not be permitted to register for subsequent work until the application is approved. The requirements which must be met before approval of admission to candidacy are:

The achievement of Full Standing

- The completion of at least fifteen (15) semester hours of graduate credit with a minimum quality point average of 3.0.
- The written approval by the student's advisory committee.
- The written approval of the chairperson of the major department.
- Successful completion of any examination which may be required by the student's department for admission to candidacy.

If the student's application for admission to candidacy is not approved due to academic deficiencies, the student cannot continue graduate study with a major in any of the departments of the college in which he/she is studying.

Students in the counseling program within the Department of Counseling and Psychology will take the national Counselor Preparation Comprehensive Examination (CPCE) during their first semester of study. This examination will be diagnostic in nature and must be passed to graduate from a counseling Ed.S. program.

Final clearance for candidacy will be achieved only upon recommendation by the department in which the student is majoring, subject to approval of the Associate Dean of the College of Graduate Studies.

Prior to admission to candidacy the student may be required to remove certain deficiencies resulting from insufficient background preparation for the specific field or from the absence of certain prerequisite courses essential in preparation for pursuing the proposed specialist program. The candidacy step should not be confused with the final comprehensive examination which is required of all degree candidates and which has been explained previously in the general regulations section of this catalog.

Transfer And Other Credit

Each candidate for the Ed.S. degree must complete a minimum of 24 semester hours credit at Tennessee Technological University.

A maximum of six (6) semester hours of transferred work with a minimum grade of "B" in each course may be included in the student's program of study. Such work must have been completed at an accredited institution which offers the Master's, Specialist's and/or Doctor's Degree (for a list of accrediting agencies recognized, refer to the U.S. Department of Education website). Credit earned through correspondence or extension courses will not be accepted toward the Ed.S. Degree.

Department of Curriculum & Instruction

A maximum of twelve (12) semester hours of transferred work with a minimum grade of "B" in each course may be included in the student's program of study with approval from advisor, department chair, and dean. Such work must have been completed at an accredited institution which offers the Master's, Specialist's and/or Doctoral Degree. Credit earned through correspondence or extension courses will not be accepted toward the M.A. Degree.

Credit by special examination is not permitted at the graduate level; however, special examinations to determine competency or proficiency in courses where credit has already been earned but is currently out-of-date may be permitted during a period of up to three (3) consecutive semesters immediately following the six-year time limitation. Special examinations may also be permitted to validate transfer credit, but the credit must be originally earned as graduate credit and not undergraduate credit.

Other Regulations

In addition to these specific requirements for the Specialist in Education Degree, all candidates will be expected to comply with general regulations of the Graduate School. (See Regulations and Degree Requirements in previous sections of this catalog.)

Doctor of Philosophy Degree General Requirements

Advisory Committee Formation

Each Ph.D. student's advisory committee is determined by the department in which the degree is offered. The committee will have a minimum number of voting members from predetermined departments or fields. The student is responsible for identifying, in consultation with the departmental chairperson, or director and dean or associate dean of the respective college, a faculty member who is willing to chair his/her advisory committee. The chairperson of the committee and the student are responsible for identifying the other faculty members required/desired and determining if they are willing to serve. Advisory committees are permitted to have more than the minimum number of members required. If necessary, the advisory committee may be co-chaired. Changes in a Ph.D. advisory committee must adhere to all policies and procedures governing graduate study at the University, as contained in the Graduate Catalog and administered by the College of Graduate Studies.

If a student is not able to identify a sufficient number and type of faculty who are suitable and willing to serve on his/her advisory committee, the student will be advised by the Dean that he/she should either change his/her area of research interest to more closely match those of the available faculty or consider selecting another major. Failure to be able to form a committee is a cause for transfer to non-degree status. Further regulations concerning the membership, appointment, and responsibilities of the advisory committee are given in other sections of the catalog, and in College of Graduate Studies Policy 282.

Program of Study

Programs of study toward advanced degrees are less formal than for undergraduate degrees. Individual programs are created for each student on the basis of educational background and career objective. Graduate degrees are not only awarded on the basis of completion of specific courses, but also on the basis of evidence of proficiency, scholarship, reasoning and investigation, and high attainments in the field of the student's specialization.

Each proposed program of study must be approved by the student's advisory committee, the departmental chairperson or program director, the dean or associate dean of the respective college, and the associate dean of the College of Graduate Studies.

There will be a hold placed on a student's registration if his/her Program of Study form has not been filed in the College of Graduate Studies office by the semester in which 15 credit hours will be earned.

Comprehensive Examination

Before requesting that his or her major professor schedule a Comprehensive Examination for Candidacy, a student must:

- have achieved Full Standing in the program; and
- have completed approximately 80% of the course work in his/her Program of Study.

The method of testing may consist of written, oral, and/or presentation components.

Details of this examination, including format, content, method of evaluation, timing, and deadlines will be determined by the college/departmental regulations. Successful completion of the Comprehensive Exam for Candidacy advances the student to official doctoral candidate status.

Admission to Candidacy

Admission to candidacy is granted when a student successfully completes the exam mentioned above. The advisory committee chairperson will complete an Admission to Candidacy Comprehensive Exam form, which will be signed by the student's advisory committee, the departmental chairperson or program director, the dean or associate dean of the respective college, and then sent to the associate dean of the College of Graduate Studies.

The candidate will then continue his/her research and prepare the doctoral dissertation and defense to fulfill all degree requirements.

Dissertation & Defense

Dissertation credit is offered in increments of 3, 6, or 9 credit hours during any given semester (and in some departments as one (1) credit hour). A graduate student shall be required to be registered for at least one (1) course appropriate to the student's degree objective in order to have access to computer equipment, laboratories, library, and other university facilities and resources even if the student is working in absentia on research and dissertation. A graduate student shall be enrolled during the term in which the degree is awarded. When a student makes satisfactory progress in research and dissertation, a grade of SP (Satisfactory Progress) will be assigned for credit earned. When satisfactory progress is not achieved, a grade of NP (No Progress) will be assigned; however, a grade of NP shall not be counted as having satisfied either program or degree requirements, and the student must register again for additional dissertation credit. Only grades of SP and NP shall be used to indicate a student's progress in dissertation credit.

The graduate student is expected to consult frequently with the major advisor during dissertation preparation. At the time the final rough draft has been completed, the dissertation should be in electronic form. The only content revisions the student should make are those suggested by the advisory committee. The student should allow ample time for the committee to review the dissertation, usually no less than two (2) weeks.

The College of Graduate Studies has published the Guide to the Preparation of Theses and Dissertations which serves as the official manual for all theses or dissertations. Also provided is a "Thesis/Dissertation Checklist" which outlines basic formatting requirements.

Although examples in this guide are recommended for making footnotes, endnotes, and giving bibliographical references, each department is encouraged to use those systems of citations that are most commonly used in its own discipline. Any other departure from this manual must have the prior approval of the associate dean of the College of Graduate Studies. The guide is on the College of Graduate Studies website.

A student must submit the final, error-free copy of his/her dissertation electronically (through eTD ProQuest) to the College of Graduate Studies by the date specified on their website's calendar of deadlines. Please see Graduate Studies' personnel regarding requirements for electronic submission or deadline date questions. Any dissertation that does not meet the required standards will be returned to the student, who will then be required to complete requested revisions and resubmit new versions until all required corrections are made. Failure to do so will result in ineligibility for graduation. All dissertations that meet the required standards will be forwarded on for publication, and the students will be eligible for graduation.

Transfer and Other Credit

For all graduate degree programs, the department will determine, at its sole discretion, the number of transfer credits it will accept, provided the department's decision is in compliance with SACSCOC Accreditation Standard 3.6.3 and any other applicable accreditation requirements. Accreditation Standard 3.6.3 states, "At least one-third of credits toward a graduate or a post-baccalaureate professional degree are earned through instruction offered by the institution awarding the degree." For a list of accrediting agencies recognized, refer to the U.S. Department of Education website.

Credit by special examination is not permitted at the graduate level; however, special examinations to determine competency or proficiency in courses where credit has already been earned but is currently out-of-date may be permitted during a period of up to three (3) consecutive semesters immediately following the eight-year time limitation. Special examinations may also be permitted to validate transfer credit, but the credit must be originally earned as graduate credit and not undergraduate credit.

Graduate credit will not be given for correspondence courses.

Graduation / Hooding

No doctoral degree candidate is permitted to participate in commencement until all requirements for the degree are successfully completed.

College of Engineering- Master of Science Degree Requirements

A master's degree is a certification that the recipient is able to read with understanding and apply with profit the literature of his/her field. The general requirements for an MS degree are the same for all departments: development and completion of a program of study which includes a minimum of 24 semester hours of course credits and at least six (6) semester hours of thesis. All pertinent regulations of the Graduate School apply.

Listed below are College of Engineering regulations that are clarifications of, or additions to, those promulgated by the Graduate School. Additional information can be found in the listings of the individual departments.

Advisory Committee

Every master's student is required to have an advisory committee having a minimum of three (3) members. The student is responsible for identifying, in consultation with the departmental chairperson, a faculty member who is willing to chair his/her advisory committee. In consultation with the chairperson of the committee, the student is responsible for identifying at least two (2) other faculty members who are willing to serve on his/her committee. Advisory committees may include more than three (3) members. If desired or required, two (2) members of the committee may serve as co-chairs of the committee rather than the committee having one (1) chair. If a student is not able to identify a sufficient number of faculty who are suitable and willing to serve on his/her advisory committee, the student will be advised by the departmental chairperson that he/she should either change his/her area of research interests to more closely match those of the available faculty or consider selecting another major. Failure to be able to form a committee is cause for transfer to non-degree status. Further regulations concerning the membership, appointment and responsibilities of a student's advisory committee are given in other sections of the catalog, including the sections on "Organization of the Graduate School" and "Degree Requirements."

Thesis/Comprehensive Examination

A thesis is required for all MS degrees in the college of engineering, except the MS in Engineering Management. All five MS degrees in the college also offer a non-thesis option.

A candidate for a master's degree must submit a thesis in writing and orally present and defend the thesis to his/her advisory committee. The meeting at which the thesis presentation and defense occurs also serves as the time for the student's final oral comprehensive examination over any or all aspects of the student's master's program. On the form on which the chairperson of the student's advisory committee reports the results of the thesis defense, the chairperson also reports the results of the comprehensive examination, including a brief synopsis of the examination.

Limitations on Graduate Assistantships

A master's student may receive support during the first two (2) calendar years after initial enrollment. This time limitation does not imply a student will receive support during his/her first two (2) years. Whether or not a student receives support depends on the availability of funds and the suitability of the student to carry out the responsibilities associated with the support. Support beyond the stated limits, regardless of source of funding in the College of Engineering, requires justification, which must be reviewed and approved by the Associate Dean of Engineering Research and Innovation prior to the implementation. (See College of Engineering website for the exception request form.)

College of Engineering- Doctor of Philosophy Degree Requirements

The Ph.D. is a research degree. The minimum requirements for a Ph.D. degree in the College of Engineering stated below are the same for all departments. Each department may include additional degree requirements for students pursuing specialization in that department.

Students Admitted with a Master's Degree

1. A minimum of 48 credits of course work and doctoral research and dissertation as follows:
 - A. A minimum of eighteen (18) credit hours of course work beyond the master's degree acceptable to the student's advisory committee. Additional six (6) credit hours of either graduate level course work or research experience as per the policy of the student's major department. No 5000-level courses are to be used to meet the minimum requirements of course work.
 - B. A minimum of twenty four (24) credit hours of doctoral research and dissertation built upon the student's course of study and making a significant contribution to the state of knowledge or to the art of the engineering profession, is required; not more than nine (9) credit hours may be earned in a particular semester.
2. Residence of four (4) semesters beyond the master's degree, with at least two (2) semesters in continuous residence, is required. All requirements, including the dissertation, must be completed within a period of eight (8) consecutive years.

3. Maintenance of a minimum quality point average of 3.0 and adherence to the general regulations of the College of Graduate Studies are expected.

All students in the program must follow a plan of study and research developed in conjunction with an advisory committee, satisfactorily complete a comprehensive examination, achieve candidacy, and satisfactorily defend their dissertation.

Students Admitted Directly from the Bachelor's Degree into the Ph.D. Degree Program

A student admitted with a bachelor's degree on exceptional basis must successfully complete a qualifying examination based mostly on undergraduate materials before the end of the second semester of enrollment. Students with a Bachelor of Science (B.S.) degree from ABET-accredited programs are exempted from this examination. Other students without such a degree, or M.S. students without an ABET-accredited B.S. degree, switching to direct Ph.D. will have to take a qualifying exam through a formal process established by the department. The process should include at a minimum an examination of the student's fundamental knowledge managed by the Graduate Committee of the department.

Based on the student's performance on the qualifying examination, the student may be (i) permitted to continue in the doctoral program, or (ii) advised to transfer to an M.S. degree program in an appropriate discipline in the college, or (iii) recommended for termination from the graduate program of the college.

If permitted to continue in the doctoral program, the student, as described elsewhere in the catalog, will select a research advisor, form an advisory committee, and submit a program of study satisfying the following requirements.

The program of study should have a minimum total of seventy two (72) credit hours of academic work, consisting of course work and dissertation work, beyond baccalaureate work, subject to the following:

- The program of study should include a minimum of forty two (42) credit hours of appropriate graduate level course work consisting of a maximum of nine (9) credit hours at the 5000-level, acceptable to the student's advisory committee.
- It should also include an additional six (6) credit hours of either graduate level course work or research experience as per the policy of the student's major department.
- A minimum of 24 credit hours of doctoral research and dissertation, built upon the student's course of study and making significant contribution to the state of knowledge and the art of the engineering profession, is required; no more than nine (9) credit hours may be earned in a particular semester.

Students Admitted Directly from the Bachelor's Degree into the Ph.D. Program Earning a Non-thesis M.S. en route

All conditions stated above for the students admitted directly into the Ph.D. program apply. In addition:

Nine (9) credit hours will count toward the non-thesis M.S. degree and toward the Ph.D. degree. If the departmental non-thesis M.S. requires a three (3) credit hour non-thesis project course, those three (3) credit hours can be counted as three (3) credit hours of dissertation research toward the Ph.D. degree. Six (6) credit hours of M.S. coursework can be counted toward the Ph.D. coursework. If no project course is required for the non-thesis M.S., then nine (9) credit hours of M.S. coursework can be counted toward the Ph.D.

Limitation on Graduate Assistantships

It is expected that a full-time, post master's Ph.D. Engineering student should be able to achieve candidacy within the first three (3) calendar years after enrollment, and a direct admit Ph.D. Engineering student after four (4) calendar years. If candidacy is not achieved within the aforementioned periods, a student must request and receive approval for an extension of assistantship following the College of Engineering's established procedure. An extension may be granted by the Associate Dean of Engineering for Research and Innovation. This limitation is regardless of student funding or the source of support for the student.

Program List by College

College of Agriculture and Human Ecology

School of Agriculture

Dr. Darron Smith, Dean

Departmental Graduate Faculty: Douglas L. Airhart, C. Pat Bagley, Dennis Duncan, Ciana Bowhay, B. Bruce Green, Dennis Fennewald, Brian Leckie, Keith D. Morris, Michael Nattrass, Seong Park, G. Kim Stearman

Although a graduate degree is not available in the School of Agriculture, certain senior-level courses have been so designed as to generate graduate credit and these courses are dually listed as 4000 (5000). A student must register for the 5000-level course in order to get graduate credit and additional assignments will be required. Students are warned that graduate credit will not be given for a 4000-level registration.

School of Human Ecology

Melinda Anderson, Director

Departmental Graduate Faculty: Melinda Anderson, Rufaro Chitiyo, Samantha Hutson, Elizabeth Ramsey, Lee Ann Shipley, Cara Sisk
Community Health and Nutrition, M.S.

Although a graduate degree is not available in Human Ecology, the School of Human Ecology does offer a Master's of Science degree in Community Health and Nutrition. Degree requirements are found on the following pages.

Master of Science

Community Health and Nutrition, M.S.

Community Health and Nutrition Program Information

Degree Requirements

The M.S. in Community Health and Nutrition will provide graduate course work to two audiences: (1) credentialed Registered Dietitians who seek a M.S. degree only and (2) students who seek both credentialing as a Registered Dietitian/Nutritionist (Future Education Model Future Graduate program) and the M.S. Degree. The M.S. degree only in Community Health and Nutrition is a 30-hour degree program. The M.S. degree plus FEM FG program requires an additional 12 credit hours in experiential learning practicum courses. Each practicum course requires approximately 54 hours of experiential learning. In addition, approximately 30 hours of experiential learning is integrated into each didactic online course.

Proposed Program of Study, Community Health and Nutrition Graduate Program:

Fall 1 Courses

- HEC 5010 - Principles of Nutrition Research Cr. 3.
- HEC 5015 - Perspectives in Rural Community Health Cr. 3.
- HEC 5025 - Cultural Issues Influencing Health Cr. 3.

Spring 1 Courses

- HEC 6201 - Community Nutrition Programs and Services Cr. 3.
- HEC 6225 - Advanced Applications of Counseling Techniques Cr. 3.
- PRST 6540 - Health Informatics Cr. 3.

Summer 1 Courses

- HEC 6405 - Nutrition Across the Life Cycle Cr. 3.
- HEC 6440 - Leadership, Advocacy, and Nutrition Policy Cr. 3.

Fall 2 Courses

- HEC 6410 - Nutrition and Aging Cr. 3.
or
- PRST 6100 - Professional Environment: Issues and Ethics Cr. 3.
- HEC 6430 - Community Health and Nutrition Capstone Cr. 3.

Total Degree Requirement: 30 hours

College of Arts and Sciences

- College of Arts and Sciences Information

Paul Semmes, Dean

Department and Program Information

The College of Arts and Sciences offers the Master of Arts degree in English, the Master of Science degree in biology, chemistry, computer science, and mathematics. Students who have adequate academic qualifications may obtain graduate minors or pursue collateral study in such areas as geology, certain foreign languages, history, journalism, and sociology.

Specializations exist in each of the major areas of study, with course selection made according to a student's undergraduate background and proposed graduate research.

The program of study for a master's degree normally requires the completion of a minimum of 30 semester hours of graduate credit, including the research and writing of a thesis; however, prerequisite courses or collateral study may expand program requirements.

Graduate assistantships are available in each of the departments offering graduate degrees. Specific information concerning assistantships and degree requirements for the master's degrees may be obtained from the respective departments.

Department of Biology

Department of Biology Web Site

Chris Brown, Chairperson

Departmental Graduate Faculty: S K Balle, David L. Beck, Christopher A. Brown, Brian D. Carver, Bradley Cohen, Daniel L. Combs, Steven Bradford Cook, W. Keith Gibbs, John H. Gunderson, Steven E. Hayslette, Carla Hurt, Robert Kissell, Bernard Kahajda, Justin N. Murdock, Christopher Murray, Nikki Panter, Mark W. Rogers, Amanda Rosenberger, Jeff Shaeffer, Katrina Twing, Christopher "Kit" Wheeler, Shawn Zeringue-Krosnick

Biology, M.S.

Biology Program Information

Departmental Admission Requirements for the M.S. Degree

Guidelines for full admission into the program require that one of the following two requirements be met:

1. A minimum overall undergraduate grade-point average of 3.0 (on a 4-point scale) OR an undergraduate grade-point average of 3.0 in all Biology, Wildlife Fisheries Science, and related courses.
2. Combined Quantitative and Verbal Revised GRE score totaling 300, and a minimum Analytical Writing score of 3.0.

Applicants that do not meet either of these guidelines can be considered for provisional admission through an appeal to the Graduate Policies Committee within the Department of Biology.

In addition to meeting the GPA or GRE requirements, a student will not be admitted without being accepted by a faculty advisor (Advisor Acceptance Form). The advisor will serve as the student's thesis advisor during the student's pursuit of the graduate degree.

Applicants should be aware that meeting these minimum requirements does not guarantee admission to the program, since:

1. The Department may not be able to financially support the research of the student, regardless of whether a student receives a stipend in the form of teaching or research assistantship. Additional resources must be provided to Biology graduate students to conduct their thesis research. The cost to conduct graduate research in the Department of Biology varies widely between and within disciplines and is affected by factors such as:
 - a. whether the study will be conducted in a laboratory or the field (or both);
 - b. whether or not specialized equipment is required.
 - c. the amount of travel that may be necessary.
 - d. wages of full-time or part-time assistants
2. The Department may have more students than the faculty can reasonably guide. Prospective Biology graduate students should contact a potential faculty advisor in their research area prior to applying for admission. A student will not be admitted without being accepted by a faculty advisor (Advisor Acceptance Form). The advisor will serve as the student's thesis advisor during the student's pursuit of the graduate degree. Acceptance of a student by the faculty advisor is dependent upon:
 - a. similarity of research interests.
 - b. experience;
 - c. recommendations;
 - d. admission standards;
 - e. number of graduate students that the faculty member is currently advising;
 - f. available funding for research.

Although the Department of Biology has no strict deadlines for application, complete applications for students being considered for teaching assistantships should be received no later than November 1 for enrollment the following Spring Semester, and April 1 for enrollment the following Fall Semester. Applicants being considered for research assistantships will be evaluated as extramural funding becomes available.

For more detailed requirements and thesis research options, contact the department chair.

Provisional Admission Procedures

Students who do not meet departmental GPA and GRE® General Test (GRE) requirements can be admitted provisionally by appealing the initial rejection decision to the Department of Biology Graduate Policies Committee. This committee will only consider appeals that are presented by the applicant's potential faculty advisor. Criteria commonly used by the Graduate Policies Committee regarding appeals are previous experience in the area of research and work history following graduation. Absolute minimum requirements for appeal consideration will consist of a minimum overall undergraduate grade point average of 2.5 (minimum requirement of Graduate School for non-provisional admission).

The Graduate Policies Committee will make the final decision for all appeals.

Provisional Status Requirements

All applicants who do not meet the minimum requirements established for admission to the Master of Science Program within the Department of Biology, and who are granted an appeal by the Department of Biology Graduate

Policies Committee, will be admitted with provisional standing. Provisions for achieving full standing will be determined by the Graduate Policies Committee in consultation with the student's faculty advisor and departmental chair.

Degree Requirements

The M.S. in Biology is a 30 hour research degree program. Core requirements are defined as follows:

- **Core required courses:** 1 hour
- **Advisor Approved Electives:** 20 hours
- **Research and Thesis:** 6 hours
- **Statistics course:** 3 hours
- **Total Hours:** 30 hours

Core Required Course (1 hour)

- BIOL 6930 - Seminar Cr. 1.

Advisor Approved Electives (20 hours)

Selection of appropriate courses (BIOL 5000, BIOL 6000, EVSB 7000 level, EVS 7900 and WFS 5000 level) will be in consultation with the student's advisory committee and/or the graduate coordinator.

Thesis Research Requirements (6 hours)

- BIOL 6990 - Research & Thesis Cr. 1-9.

Core Statistics Requirement (3 hours)

- BIOL 4220 (5220) - Biostatistics Cr. 3.
- BIOL 6140 - Fish and Wildlife Biometrics Cr. 3.
- BIOL 6810 - Ecological Ordination Cr. 3.
- MATH 4470 (5470) - Probability and Statistics I Cr. 3.
- MATH 4480 (5480) - Probability and Statistics II Cr. 3.
- MATH 6070 - Applied Linear Statistical Methods I Cr. 3.
- MATH 6080 - Applied Linear Statistical Methods II Cr. 3.
- MATH 6170 - Experimental Design I Cr. 3.
- MATH 6180 - Experimental Design II Cr. 3.
- MATH 6270 - Mathematical Statistics Cr. 3.
- MATH 6470 - Environmental Statistics Cr. 3.
- PSY 6310 - Educational Statistics Cr. 3.
- PSY 7310 - Advanced Educational Statistics Cr. 3.
- WFS 4220 (5220) - Biostatistics Cr. 3.

Department of Chemistry

- Department of Chemistry Information

Jeffrey O. Boles, Chairperson

Departmental Graduate Faculty: Jeffrey O. Boles, Jesse D. Carrick, Andrew Callender, William Carroll, Amanda J. Carroll, Derek J. Cashman, David J. Crouse, Dale Ensor (emeritus), Wilson Gichuhi, Robert J. Glinski, Cory Hawkins, Zachary Holden, Xiaohua Jiang, Edward C. Lisic, Twanelle Deann Walker Majors, Jonathan Moldenhaur, Philip B. Oldham, Chad E. Rezsnyak, Daniel J. Swartling, Martha Wells, Tao Yu, Xuanzhi Zhang, Hong Zhang

Chemistry, M.S.

Chemistry Program Information

Departmental Overview

The Department of Chemistry offers a program of study leading to an M.S. in Chemistry designed to prepare graduates for a successful career in industry or to continue their education in a doctoral program or professional school. By offering courses in the five (5) major areas of chemistry, the students have an opportunity to reinforce their background and expand their knowledge in areas not covered by their undergraduate degree. The faculty maintains a wide variety of research programs, which gives each student a chance to conduct, evaluate, and report on original research. A low student-to-faculty ratio allows for individual attention and produces a stimulating intellectual atmosphere conducive to learning.

Fast-Track M.S. Program

The Fast-Track M.S. Chemistry program is designed for chemistry majors in the A.C.S.-certified concentration, enabling them to earn the M.S. degree in Chemistry by staying at Tech one (1) additional academic year and two (2) summers. A senior who opts for the fast-track program will take nine (9) hours graduate coursework as a senior. These hours can include either 4000/5000 dually-listed chemistry courses taken at the 5000-level OR can include 6000-level chemistry and 7000-level environmental science courses. Up to six (6) hours of this graduate coursework, exclusive of directed study, taken during the student's senior year can be used to satisfy both undergraduate and graduate degree requirements. These courses must be taken at Tennessee Tech University and must be approved as appropriate substitutions in the undergraduate curriculum for senior CHEM electives. The admission requirements are:

1. Subject to approval by the chair and the chemistry graduate committee
2. Overall GPA = 2.8 or above, 3.0 or above in upper-division chemistry courses
3. Application allowed once Junior Standing is earned
4. Can begin Fast-Track Program as a Senior
5. Final B.S. must include a minimum of:
 - two (2) semesters of calculus
 - two (2) semesters each of general, organic, and physical chemistry
 - one (1) semester each of analytical chemistry and biochemistry

Entrance to the Fast-Track program can be granted if the student has met requirements 1 and 2 above.

TTU seniors who do not fully qualify for the Fast-Track program but who plan to seek an M.S. Chemistry degree at TTU may take up to nine (9) graduate-level coursework hours as a senior. Subject to instructor approval, these hours can include either 4000/5000 dually-listed chemistry courses taken at the 5000-level OR can include 6000-level

chemistry and 7000-level environmental science courses. Up to six (6) hours of this graduate coursework taken during the student's senior year can be used to satisfy both undergraduate and graduate degree requirements.

Departmental Admission Requirements

Students seeking admission to full standing in the M.S. program in Chemistry are required to have a Bachelor's degree in Chemistry that has been certified by the American Chemical Society or course work equivalent to this degree, with an undergraduate GPA of at least 2.5 on a 4.0 scale. Applicants lacking prerequisite coursework may be admitted to provisional standing and required to pass the prerequisite coursework before being admitted to full standing.

Applicants with an undergraduate GPA less than 3.0 and an application packet (including a statement of purpose and letter of recommendation) that does not demonstrate a strong justification for admission may be required to take the general portion of the GRE General Test (GRE). To be admitted to full standing an applicant must score at least 300 (Quantitative and Verbal combined) on the GRE General Test, and at least 3.5 on the Analytical Writing portion. An applicant with an undergraduate GPA of less than 3.0 who does not submit GRE scores, or whose scores do not meet the requirements, may still be considered for admission, if the applicant has demonstrated outstanding potential for advanced study and research through research or work experience. Applicants with an undergraduate GPA greater than 3.0 MAY submit GRE scores, but the GRE is not required.

All students must submit a short (2-3 page) "Statement of Purpose". The "Statement of Purpose" must address skills and achievements from previous academic, research, or industrial experience, and must identify specific research topics of interest to pursue at TTU. Applicants will not be considered without a Statement of Purpose. The statement of purpose is reviewed as a criterion for admission, a generic statement of purpose is discouraged.

All students must supply at least one letter of recommendation from a work or research supervisor or mentor in a STEM discipline or enterprise.

International students are required to demonstrate competency in spoken and written English by taking appropriate standardized tests. Common examples include TOEFL examination (minimum score of 550 for the paper-based test or 79 for the Internet-based test with no sub score below 20) and the IELTS examination (minimum score 6.0)

Degree Requirements

- **Core Required Courses:** 9 hours
- **Advanced Electives:** 12 hours
- **Additional Electives:** 9 hours
- **Total:** 30 hours

The program of study for the M.S. in Chemistry includes satisfactory completion of a thesis, and coursework as detailed below:

Required Core

Seminars (2 hours)

- CHEM 6910 - Chemistry Literature Seminar Cr. 1.
- CHEM 6911 - Chemistry Thesis Seminar Cr. 1.

Research & Thesis (6 hours)

- CHEM 6990 - Research and Thesis Cr. 1-9. (6 hours required)

Directed Studies (1 hour)

- CHEM 6900 - Directed Studies in Chemistry Cr. 1.

Note:

CHEM 6900 (Directed Studies) includes a comprehensive oral examination administered by the student's graduate committee.

Advanced Electives (12 hours)

Advanced Electives may be selected from any coursework that meets the department's expectations, based on the student's Program of Study and in consultation with the student's graduate committee and the program academic advisor.

- Any CHEM 6000 OR 7000 LEVEL OR EVS 7000 LEVEL

Additional Electives (9 hours)

Additional Electives may be selected from any coursework that meets the department's expectations, based on the student's Program of Study and in consultation with the student's graduate committee and the program academic advisor.

- Any CHEM 5000 OR 6000 Level

Total Degree Requirements: 30 hours

Department of Earth Sciences

Jennette Luna, Interim Chairperson

Departmental Graduate Faculty: Joseph Asante, Evan A. Hart, Peter Li, Lauren Michel

No graduate degree is offered in Earth Sciences, but courses may be used (with advisory committee approval) as electives in other fields of study.

Students majoring in Earth Sciences may "FastTrack" into the Professional Science Master's in Environmental Informatics program. For information on FastTrack requirements, visit the Professional Science, Environmental Informatics Concentration, P.S.M. catalog page.

Department of English

Department of English Web Site

Linda Null, Interim Chairperson

Departmental Graduate Faculty:

Full Membership: Anthony D. Baker, Paulina Bounds, Michael L. Burdick, Mark H. Creter, Kristen Deiter, Monic Ductan, Daniel Ernst, Jennifer Gray, Erin Hoover, Helen Hunt, Graham S. Kash, Shirley D. Laird, Josephine A. McQuail, Linda J. Null, Ted Pelton, Kristin D. Pickering, Mari Ramier, Matthew Stenson, Brian Williams

Associate Membership: Sharon K. Henry, Susan Moynihan

Departmental Overview

The Master of Arts degree program in the Department of English prepares graduates for success in any further graduate and professional education which might require superior analytical and communication skills. It prepares them for Ph.D. programs in English by increasing their knowledge of literary history and improving their skills in writing, literary analysis, and research. Graduates can become effective high-school or college-level teachers by improving their knowledge of writing pedagogy and theory. They will also be prepared for careers outside the academic world wherever superior analytical and communication skills and knowledge of literary and cultural traditions are essential.

Concentrations

Literature: This concentration is designed for graduate students wishing to further develop their abilities as literary scholars and critics, in preparation for graduate school and/or careers requiring high-level interpretive and written communication skills.

Creative Writing: This concentration is a great option for graduate students wishing to develop their abilities as creative writers in poetry, fiction, and/or essay/memoir. Graduates in this degree concentration will develop exceptional creative and communication skills, applicable to a variety of career uses, as well as for artistic development.

Professional and Technical Communication: This concentration was created for graduate students who are preparing for careers within the field of Professional and Technical Communication. Students will have opportunities to work with other disciplines (such as Engineering, Business, Nursing, and Law), both on campus and off campus, that require facility with technical writing and effective communication skills in business environments. Additionally, this concentration provides opportunities for students with various backgrounds who are seeking advanced skills in grant writing, technical writing, or other advanced Professional and Technical Communication proficiency's.

BA/MA Fast Track - English

The Fast Track program is designed to enable undergraduates to accumulate up to six (6) credit hours of graduate coursework, to satisfy both undergraduate and graduate degree requirements, while still pursuing their undergraduate degree. The coursework would enable an efficient graduate program transition with the potential for accelerated completion. The courses must be taken at Tennessee Tech University. (Students who reach the number of credits required for their undergraduate degrees can also take additional courses for graduate credit before graduation, thus potentially accelerating their M.A. program even more.)

The minimum admission requirements for participating in the English Fast Track Program are:

- Enrollment as a TTU undergraduate English major with at least 90 hours of completed courses within their program of study;
- Completion of ENGL 3000;
- Overall GPA of 3.25 or better; GPA in 3000-level and above English coursework of 3.5 or better;
- Recommendation from the student's undergraduate advisor;
- Course approval from course professor and graduate faculty advisor;
- In addition to the requirements for admission to the Fast Track BA/MA program, all requirements for admission to the graduate program must also be met upon graduation. Meeting these minimum requirements does not guarantee admission to the graduate program.

Departmental Admission Requirements

- All applicants submit a statement of purpose. The statement of purpose should be no longer than two pages and include the following information:
 - Description of the skills and qualities the candidate brings to the program
 - Candidate's motivation for obtaining an MA in English
 - Candidate's long-term goals in seeking an MA in English and how the MA in English contributes to the achievement of those goals
- If the applicant is applying for a Teaching Assistantship, the candidate should use this statement to address the candidate's teaching interests and how the teaching assistantship contributes to the applicant's overall goals.

Evaluation Criteria

The Graduate Committee will evaluate each application using the following criteria:

Transcript; based on QPA in all English courses at the 2000+ level	2.7 - 2.999	10 Pt's.
	3.0 - 3.499	20 Pt's.
	3.5 - 4.0	30 Pt's.
Statement of Purpose	7-8	5 Pt's.
	9-10	10 Pt's.
	11-12	20 Pt's.
	13-15	30 Pt's.
Writing Sample Score:	7-8	5 Pt's.
	9-10	10 Pt's.
	11-12	20 Pt's.
	13-15	30 Pt's.

The Graduate Committee shall admit to the program those students whose applications (based on the Evaluation Criteria above) either:

- earn a minimum of 10 points each in the Transcript, Writing Sample, and statement of purpose
- OR have a total score of 35 points or higher regardless of their distribution.

For full consideration, applicants for fall admission must submit all application materials by May 1 and applicants for spring admission must submit all materials by November 1. We encourage early application: graduate teaching assistantships are limited in number and will be awarded on a competitive basis.

Departmental Degree Requirements by Concentration

The Master of Arts degree program in English has both thesis (30 credit hours) and non-thesis (33 credit hours) options. Details about the non-thesis requirements are listed with each concentration below.

All thesis-option students, regardless of concentration, are required to take 6 credit hours of ENGL 6990 and complete all thesis requirements, in addition to the specific course requirements for their respective concentrations. An oral defense is required for all concentrations, and thesis students in the Creative Writing or Professional and Technical Communication concentrations must also complete a written comprehensive exam.

English, Creative Writing Concentration, M.A.

English Program Information

Degree Requirements

Thesis Option

- **Core Required Courses:** 9 hours
- **Concentration Content Courses:** 15 hours
- **Research and Thesis Requirement:** 6 hours
- **Total Degree Requirements:** 30 hours

Core Required Courses (9 hours)

When necessary, a committee of the instructor of record, the department chair, and the graduate advisor will determine how a course fits into the existing curriculum.

- One 6000-level course in American Literature
- One 6000-level course in British Literature
- ENGL 6000 - Introduction to Graduate Studies Cr. 3.

Concentration Content Courses (15 hours)

Three courses from among the following (must take 5000-level in dual-listed courses):

- ENGL 4430 (5430) - Creative Writing: Fiction Cr. 3. *
- ENGL 4440 (5440) - Creative Writing: Essay Cr. 3. *
- ENGL 4450 (5450) - Creative Writing: Poetry Cr. 3. *
- ENGL 6710 - Poetry Workshop Cr. 3.
- ENGL 6720 - Creative Prose Workshop Cr. 3.
- Two additional graduate-level electives in ENGL, THEA, or PC (at least one of these must be at the 6000-level).

*Any of these courses may be repeated, for credit.

Research and Thesis Requirement (6 hours):

- ENGL 6990 - Research and Thesis Cr. 3, 6.
The Creative Writing concentration does not include a non-thesis option.

Course Repeatability Options

Previously Taken as an Undergraduate

Courses may be repeated one time by a graduate student who has previously taken it as an undergraduate, provided the content is different. Applicable courses include:

- ENGL 4210 (5210) - Eighteenth-Century British Literature Cr. 3.
- ENGL 4250 (5250) - Post Modern Literatures in English Cr. 3.
- ENGL 4310 (5310) - Early American Literature Cr. 3.
- ENGL 4320 (5320) - Nineteenth Century American Literature Cr. 3.
- ENGL 4330 (5330) - Modern American Literature Cr. 3.
- ENGL 4610 (5610) - Novel Cr. 3.
- ENGL 4630 (5630) - Literary Criticism and Theory Cr. 3.
- ENGL 4650 (5650) - The Graphic Novel Cr. 3.
- ENGL 4712 (5712) - African American Literature Cr. 3.
- ENGL 4713 (5713) - Native American Literature Cr. 3.
- ENGL 4931 (5931) - Literature and the Environment Cr. 3.
- ENGL 4970 (5970) - Professional Communication II Cr. 3.
- PC 4850 (5850) - Internship Cr. 3,6,9,12.
- PC 4940 (5940) - Technical Editing Cr. 3.
- PC 4970 (5970) - Professional Communication II Cr. 3.
- PC 4990 (5990) - Business and Grant Proposal Writing Cr. 3.

Repeatable by Graduate Student

Courses may be repeated one time by a graduate student, provided the content is different. Applicable courses include:

- ENGL 6020 - Seminar in Early British Literature Cr. 3.
- ENGL 6080 - Seminar in British Literature 1500-1650 Cr. 3.
- ENGL 6150 - Seminar in British Literature, 1650-1800 Cr. 3.
- ENGL 6400 - Special Topics Cr. 3.
- ENGL 6520 - Seminar in Early American Literature Cr. 3.
- ENGL 6590 - Seminar in Nineteenth Century American Literature Cr. 3.
- ENGL 6640 - Sem. in 20th & 21st Century Am Lit Cr. 3.
- PC 6030 - Core Issues and Research in Professional and Technical Communication Cr. 3.
- PC 6050 - The Rhetoric of STEM Professions Cr. 3.

English, Literature Concentration, M.A.

English Program Information

Degree Requirements

The Literature concentration provides both a Thesis and Non-Thesis option for our students. The program consists of core courses, concentration content courses, and a research component as summarized below:

Thesis Option

- **Core Coursework:** 9 hours
- **Concentration Content Coursework:** 15 hours
- **Research and Thesis:** 6 hours
- **Total Degree Requirements:** 30 hours

Non-Thesis Option

- **Core Coursework:** 9 hours
- **Concentration Content Coursework:** 15 hours
- **Non-Thesis Requirement:** 9 hours
- **Total Degree Requirements:** 33 hours

All Students Must Complete:

- One graduate course in British Literature before 1800
- One graduate course in British Literature after 1800
- One graduate course in American Literature before 1865
- One graduate course in American Literature after 1865
- ENGL 6000 - Introduction to Graduate Studies
- Three graduate-level electives selected by student and advisor

Core Courses (9 hours):

- One 6000-level course in American Literature
- One 6000-level course in British Literature
- ENGL 6000 - Introduction to Graduate Studies

Concentration Content Coursework (15 hours)*:

- One additional course in American Literature
- One additional course in British Literature
- Three graduate-level electives selected by the student and advisor

*Of the two required British Literature courses, one must be pre-1800 and the other post-1800. Of the two required American Literature courses, one must be pre-1865 and the other post-1865.

*Of the following courses, whether the course belongs in any particular category depends on the professor's focus during the semester the course is offered.

British Literature Before 1800

- ENGL 4121 (5121) - Shakespeare Cr. 3.
- ENGL 4130 (5130) - Milton Cr. 3.
- ENGL 4140 (5140) - Topics in British Literature to 1667 Cr. 3.
- ENGL 4210 (5210) - Eighteenth-Century British Literature Cr. 3.
- ENGL 4240 (5240) - Topics in British Literature After 1667 Cr. 3.
- ENGL 4610 (5610) - Novel Cr. 3.
- ENGL 4620 (5620) - Poetry: Form, Genre, Theory Cr. 3.
- ENGL 4630 (5630) - Literary Criticism and Theory Cr. 3.
- ENGL 4731 (5731) - Approaches to Women and Literature Cr. 3.
- ENGL 4840 (5840) - The Gothic Tale of Terror Cr. 3.
- ENGL 4911 (5911) - The Literature of Science Cr. 3.
- ENGL 4931 (5931) - Literature and the Environment Cr. 3.
- ENGL 4981 (5981) - Topics Cr. 1.
- ENGL 4982 (5982) - Topics Cr. 2.
- ENGL 4983 (5983) - Topics Cr. 3.
- ENGL 6020 - Seminar in Early British Literature Cr. 3.

- ENGL 6080 - Seminar in British Literature 1500-1650 Cr. 3.
- ENGL 6150 - Seminar in British Literature, 1650-1800 Cr. 3.
- ENGL 6400 - Special Topics Cr. 3.

British Literature After 1800

- ENGL 4221 (5221) - Romantic Literature Cr. 3.
- ENGL 4231 (5231) - Victorian Literature Cr. 3.
- ENGL 4240 (5240) - Topics in British Literature After 1667 Cr. 3.
- ENGL 4610 (5610) - Novel Cr. 3.
- ENGL 4620 (5620) - Poetry: Form, Genre, Theory Cr. 3.
- ENGL 4630 (5630) - Literary Criticism and Theory Cr. 3.
- ENGL 4731 (5731) - Approaches to Women and Literature Cr. 3.
- ENGL 4840 (5840) - The Gothic Tale of Terror Cr. 3.
- ENGL 4921 (5921) - Literature and Technology Cr. 3.
- ENGL 4931 (5931) - Literature and the Environment Cr. 3.
- ENGL 4981 (5981) - Topics Cr. 1.
- ENGL 4982 (5982) - Topics Cr. 2.
- ENGL 4983 (5983) - Topics Cr. 3.
- ENGL 6290 - Seminar in Nineteenth Century British Literature Cr. 3.
- ENGL 6350 - Sem. in 20th & 21st Century Brit Lit Cr. 3.
- ENGL 6400 - Special Topics Cr. 3.

American Literature Before 1865

- ENGL 4310 (5310) - Early American Literature Cr. 3.
- ENGL 4320 (5320) - Nineteenth Century American Literature Cr. 3.
- ENGL 4340 (5340) - Topics in American Literature Cr. 3.
- ENGL 4610 (5610) - Novel Cr. 3.
- ENGL 4620 (5620) - Poetry: Form, Genre, Theory Cr. 3.
- ENGL 4630 (5630) - Literary Criticism and Theory Cr. 3.
- ENGL 4731 (5731) - Approaches to Women and Literature Cr. 3.
- ENGL 4830 (5830) - Southern Literature Cr. 3.
- ENGL 4840 (5840) - The Gothic Tale of Terror Cr. 3.
- ENGL 4911 (5911) - The Literature of Science Cr. 3.
- ENGL 4931 (5931) - Literature and the Environment Cr. 3.
- ENGL 4981 (5981) - Topics Cr. 1.
- ENGL 4982 (5982) - Topics Cr. 2.
- ENGL 4983 (5983) - Topics Cr. 3.
- ENGL 6400 - Special Topics Cr. 3.
- ENGL 6520 - Seminar in Early American Literature Cr. 3.
- ENGL 6590 - Seminar in Nineteenth Century American Literature Cr. 3.

American Literature After 1865

- ENGL 4320 (5320) - Nineteenth Century American Literature Cr. 3.

- ENGL 4330 (5330) - Modern American Literature Cr. 3.
- ENGL 4340 (5340) - Topics in American Literature Cr. 3.
- ENGL 4610 (5610) - Novel Cr. 3.
- ENGL 4620 (5620) - Poetry: Form, Genre, Theory Cr. 3.
- ENGL 4630 (5630) - Literary Criticism and Theory Cr. 3.
- ENGL 4731 (5731) - Approaches to Women and Literature Cr. 3.
- ENGL 4830 (5830) - Southern Literature Cr. 3.
- ENGL 4840 (5840) - The Gothic Tale of Terror Cr. 3.
- ENGL 4911 (5911) - The Literature of Science Cr. 3.
- ENGL 4921 (5921) - Literature and Technology Cr. 3.
- ENGL 4931 (5931) - Literature and the Environment Cr. 3.
- ENGL 4981 (5981) - Topics Cr. 1.
- ENGL 4982 (5982) - Topics Cr. 2.
- ENGL 4983 (5983) - Topics Cr. 3.
- ENGL 4250 (5250) - Post Modern Literatures in English Cr. 3.
- ENGL 6590 - Seminar in Nineteenth Century American Literature Cr. 3.
- ENGL 6640 - Sem. in 20th & 21st Century Am Lit Cr. 3.
- ENGL 6400 - Special Topics Cr. 3.

Non-Thesis Degree Requirements (9 hours)

Non-Thesis students are required to complete the following:

- Comprehensive Exam
 - In their final semester in the program, students will take a comprehensive exam based on the combined reading lists from the three members of the student's advisory committee. The exam will be comprised of questions selected by the committee. All possible questions will be shared with the student in advance, but the student will not know ahead of time which specific questions will be selected. The student will have up to six hours to complete the proctored, closed-book exam.
 - Students will then orally defend their exams to their committee, and the faculty committee members will evaluate the questions and defense on a pass/fail basis. A "pass" for the exam requires a simple majority of the committee.
 - ENGL 6890 - Directed Research Cr. 3.
 - Two additional graduate-level electives selected by student and advisor
- *When necessary, a committee of the instructor of record, the department chair, and the graduate advisor will determine how a course fits into the existing curriculum.

Course Repeatability Options

Previously Taken as an Undergraduate

Courses may be repeated one time by a graduate student who has previously taken it as an undergraduate, provided the content is different. Applicable courses include:

- ENGL 4210 (5210) - Eighteenth-Century British Literature Cr. 3.
- ENGL 4250 (5250) - Post Modern Literatures in English Cr. 3.
- ENGL 4310 (5310) - Early American Literature Cr. 3.
- ENGL 4320 (5320) - Nineteenth Century American Literature Cr. 3.
- ENGL 4330 (5330) - Modern American Literature Cr. 3.

- ENGL 4610 (5610) - Novel Cr. 3.
- ENGL 4630 (5630) - Literary Criticism and Theory Cr. 3.
- ENGL 4650 (5650) - The Graphic Novel Cr. 3.
- ENGL 4712 (5712) - African American Literature Cr. 3.
- ENGL 4713 (5713) - Native American Literature Cr. 3.
- ENGL 4931 (5931) - Literature and the Environment Cr. 3.
- ENGL 4970 (5970) - Professional Communication II Cr. 3.
- PC 4850 (5850) - Internship Cr. 3,6,9,12.
- PC 4940 (5940) - Technical Editing Cr. 3.
- PC 4970 (5970) - Professional Communication II Cr. 3.
- PC 4990 (5990) - Business and Grant Proposal Writing Cr. 3.

Repeatable by Graduate Student

Courses may be repeated one time by a graduate student, provided the content is different. Applicable courses include:

- ENGL 6020 - Seminar in Early British Literature Cr. 3.
- ENGL 6080 - Seminar in British Literature 1500-1650 Cr. 3.
- ENGL 6150 - Seminar in British Literature, 1650-1800 Cr. 3.
- ENGL 6400 - Special Topics Cr. 3.
- ENGL 6520 - Seminar in Early American Literature Cr. 3.
- ENGL 6590 - Seminar in Nineteenth Century American Literature Cr. 3.
- ENGL 6640 - Sem. in 20th & 21st Century Am Lit Cr. 3.
- PC 6030 - Core Issues and Research in Professional and Technical Communication Cr. 3.
- PC 6050 - The Rhetoric of STEM Professions Cr. 3.

English, Professional and Technical Communication Concentration, M.A.

English Program Information

Degree Requirements

The Professional and Technical Communication concentration is comprised of three components: core courses, concentration courses, and a research component. The program is available in a Thesis Option (30 hours) and Non-Thesis option (33 hours).

Thesis Option

- **Core Course Requirements:** 9 hours
- **Concentration Course Requirements:** 15 hours
- **Research and Thesis Requirement:** 6 hours
- **Total Degree Requirements:** 30 hours

Non-Thesis Option

- **Core Course Requirements:** 9 hours
- **Concentration Course Requirements:** 15 hours
- **Advisor Approved Electives:** 3 hours
- **Non-Thesis Research Requirement:** 6 hours

- **Total Degree Requirements:** 33 hours

Core Courses (9 hours)

*When necessary, a committee of the instructor of record, the department chair, and the graduate advisor will determine how a course fits into the existing curriculum.

- One 6000-level course in American Literature
- One 6000-level course in British Literature
- ENGL 6000 - Introduction to Graduate Studies Cr. 3.

Concentration Content Courses (15 hours)

- PC 6030 - Core Issues and Research in Professional and Technical Communication Cr. 3.
- PC 6040 - Special Topics in Professional and Technical Communication and Industry Cr. 3.
- PC 6050 - The Rhetoric of STEM Professions Cr. 3.
For students who have taken any of the above PC courses at the 4000-level, two of the following 5000-level PC courses may be substituted for two of the above 5000-level courses:
- ENGL 4411 (5411) - Writing in the Professions Cr. 3.
- ENGL 4421 (5421) - Forms of Argumentation and Persuasion: Theory and Practice Cr. 3.
- ENGL 4511 (5511) - Introduction to Descriptive Linguistics Cr. 3.
- ENGL 4521 (5521) - History of the English Language Cr. 3.
- ENGL 4531 (5531) - Grammar and Language Cr. 3.
- ENGL 4541 (5541) - Topics in Linguistics/Language Cr. 3.
- ENGL 4451 (5451) - Introduction to Rhetoric: Theory and Practice Cr. 3.
- ENGL 4561 (5561) - American English Cr. 3.

9 credit hours from 5000-level courses below*

- PC 4850 (5850) - Internship Cr. 3,6,9,12.
- PC 4940 (5940) - Technical Editing Cr. 3.
- PC 4950 (5950) - Topics in Professional and Technical Communication CR. 3
- PC 4970 (5970) - Professional Communication II Cr. 3.
- PC 4990 (5990) - Business and Grant Proposal Writing Cr. 3.
- Either PC 6040 or PC 6050 (PC 6040 and PC 6050 may be taken twice, provided the content is different.)

Thesis Requirement (6 hours):

- ENGL 6990 - Research and Thesis Cr. 3, 6.

Non-Thesis Requirements (9 hours):

- Portfolio
 - The student will be responsible for compiling a four-part portfolio, to be designed in conjunction with and reviewed by their faculty committee. Students will orally defend their portfolios to their committee, and faculty committee members will then evaluate the questions and defense on a pass/fail basis. A "pass" for the defense requires a simple majority of the committee.

- Portfolio Components
 1. Project Proposal/Prospectus which provides background on the projects, theoretical influences [drawn from courses] on their proposed redevelopment, a description of the specific projects included, and a timeline for completion.
 2. Two digital artifacts from other graduate courses that have been redeveloped and expanded (Examples include but are not limited to podcasts, videos, social media creation and curation accounts, websites, technical reports, and grants.)
 3. A Client Project (This would be completed while a student is enrolled in a graduate-level internship. Because the portfolio option requires an additional course, that course would be PC 4850 (5850) - Internship.)
 4. A Critical Reflection (This reflection integrates sources/theoretical background from previous courses as well as additional sources.)
- Comprehensive Exam based on the portfolio and defense
- PC 4850 (5850) - Internship Cr. 3,6,9,12.
- ENGL 6890 - Directed Research Cr. 3.
- One graduate-level elective to be selected by student and advisor. (ENGL 5XXX - ENGL 6XXX)

NOTE: While students within the Professional and Technical Communication concentration of the English M.A. will have opportunities for teaching assistantships, graduate students will not teach PC 2500 - Communicating in the Professions.

Course Repeatability Options

Previously Taken as an Undergraduate

Courses may be repeated one time by a graduate student who has previously taken it as an undergraduate, provided the content is different. Applicable courses include:

- ENGL 4210 (5210) - Eighteenth-Century British Literature Cr. 3.
- ENGL 4250 (5250) - Post Modern Literatures in English Cr. 3.
- ENGL 4310 (5310) - Early American Literature Cr. 3.
- ENGL 4320 (5320) - Nineteenth Century American Literature Cr. 3.
- ENGL 4330 (5330) - Modern American Literature Cr. 3.
- ENGL 4610 (5610) - Novel Cr. 3.
- ENGL 4630 (5630) - Literary Criticism and Theory Cr. 3.
- ENGL 4650 (5650) - The Graphic Novel Cr. 3.
- ENGL 4712 (5712) - African American Literature Cr. 3.
- ENGL 4713 (5713) - Native American Literature Cr. 3.
- ENGL 4931 (5931) - Literature and the Environment Cr. 3.
- ENGL 4970 (5970) - Professional Communication II Cr. 3.
- PC 4850 (5850) - Internship Cr. 3,6,9,12.
- PC 4940 (5940) - Technical Editing Cr. 3.
- PC 4970 (5970) - Professional Communication II Cr. 3.
- PC 4990 (5990) - Business and Grant Proposal Writing Cr. 3.

Repeatable by Graduate Student

Courses may be repeated one time by a graduate student, provided the content is different. Applicable courses include:

- ENGL 6020 - Seminar in Early British Literature Cr. 3.
- ENGL 6080 - Seminar in British Literature 1500-1650 Cr. 3.
- ENGL 6150 - Seminar in British Literature, 1650-1800 Cr. 3.
- ENGL 6400 - Special Topics Cr. 3.
- ENGL 6520 - Seminar in Early American Literature Cr. 3.
- ENGL 6590 - Seminar in Nineteenth Century American Literature Cr. 3.
- ENGL 6640 - Sem. in 20th & 21st Century Am Lit Cr. 3.
- PC 6030 - Core Issues and Research in Professional and Technical Communication Cr. 3.
- PC 6050 - The Rhetoric of STEM Professions Cr. 3.

Department of Foreign Languages

Mark Groundland, Interim Chairperson

Departmental Graduate Faculty: Michael Olsen

No degree is offered in Foreign Languages but courses may be used (with advisory committee approval) as electives in other fields of study.

Department of History

Kent Dollar, Chairperson

Departmental Graduate Faculty: Krystal Akehinmi, Arthur Banton, Kent T. Dollar, Allan E. Driggers, Paula K. Hinton, Susan D. Laningham, C. Elizabeth Propes, Jeffery J. Roberts, Troy D. Smith

No degree is offered in History but courses may be used (with advisory committee approval) as electives in other fields of study.

Unless otherwise noted, the courses listed have the prerequisite of 6 semester hours of history or consent of instructor.

Department of Mathematics

Department of Mathematics Web Site

Michael Allen, Professor, Interim Chair

Departmental Graduate Faculty: Amy Chambers, Christopher Davis, Andrew Hetzel, Damian Kubiak, Richard C. Le Borne, Yung-Way Liu, Motoya Machida, Alan D. Mills, Brian M. O'Connor, Chudamani Poudyal, Alexander Shibakov, David Smith, Padmini P. Veerapen

Mathematics, M.S.

Mathematics Program Information

Departmental Overview

The Department of Mathematics offers a comprehensive program leading to a Master of Science degree in Mathematics. The program of study provides suitable preparation for further study at the doctoral level or for a career in teaching, government, or industry. The moderate size of the program encourages faculty-student interaction and allows the student an opportunity to tailor a program of study based on individual background, interest, and goals. Graduate students attend a weekly Graduate Seminar and develop teaching skills through participation in the weekly Teaching Seminar. For more information, please contact the Mathematics Department at (931) 372-3441, or visit the departmental web page at <http://www.tntech.edu/math>.

B.S./M.S. Fast Track Program - Mathematics

The Fast Track program is designed to enable promising undergraduate mathematics students at Tennessee Tech to begin their pursuit of a Master's degree in Mathematics during their senior year. Upon admission to the program, up to six (6) hours of graduate mathematics courses taken during the senior year can be used to satisfy both undergraduate and graduate degree requirements (see restrictions below).

To be eligible, a student must have an overall GPA of at least 3.25 and have a "B" or better in all upper division Mathematics courses. Students who meet these minimum requirements may apply to the Mathematics Department for admission to the Fast Track program. The department's graduate committee will review the application and make a decision for approval.

The student must earn a grade of "B" or better in the graduate courses which are "double-counted" to have the credit apply toward the Master's degree. In addition, the following classes are not eligible for Fast Track credit: Math 5010, 5110, 5470, 5530, 5510, 5610, and 5620.

Participation in the Fast Track program does not guarantee admission to the Mathematics graduate program. The student must meet all requirements for admission to the graduate program upon graduation, and must complete the Fast Track program successfully will be given strong consideration for both admission and financial assistance in the graduate program.

Departmental Admission Requirements

As a necessary condition to be admitted to the Mathematics Graduate Program with Full Standing, and applicant must meet the following minimum requirements:

1. successful completion (at least a "C" or better) or at least one semester-long undergraduate course in abstract algebra (MATH 4010 or equivalent)
2. successful completion (at least a "C" or better) of at least one semester-long undergraduate courses in real analysis (MATH 4110 or equivalent)
3. an overall undergraduate QPA of at least 2.5 (based on a 4.0 scale)
4. at least 3 letters of recommendation each indicating an expectation for success in a graduate mathematics program
5. (international students only) a TOEFL score of at least 550 or an IELTS score of at least 6.0 or the attainment of level 18 in the FLS international Intensive ESL program
6. Demonstrated potential for success in a graduate mathematics program by attaining **at least one** of the following
 1. an overall undergraduate mathematics QPA of at least 3.5 (based on a 4.0 scale);
 2. at least a 140 verbal score, 150 quantitative score, and 3.0 analytical writing score on the GRE General Examination
 3. at least a 700 on the GRE Subject Test in Mathematics

It should be understood that fulfilling the above minimum requirements is not sufficient to guarantee that an applicant will be admitted with full standing. A student may be admitted to the Mathematics Graduate Program with Provisional Standing if one or more of the above requirements are not met, assuming that the student has an overall undergraduate QPA of at least 2.25 (based on a 4.0 scale) and at least 3 letters of recommendation each indicating and expectation for success in a graduate mathematics program. Recommendations for admission (with Full or Provisional Standing) are made by the Mathematics Department Chairperson in consultation with the Mathematics Graduate Committee based upon an analysis of the applicant's mathematical background and potential for success in

the Mathematics Graduate Program. As student in Provisional Standing may be reclassified to Full Standing once the student has satisfied the appropriate requirements detailed in the admission letter.

For the sake of evaluation for an assistantship, applicants are highly encouraged to take both the GRE General Examination and the GRE Subject Test in Mathematics and submit their scores with the application.

Departmental Degree Requirements

Requirements for the M.S. degree in Mathematics are:

Thesis Option

The M.S. in Mathematics with a Thesis option is a 30 hour degree program. Degree requirements include:

- **Core Required Coursework:** 6 hours
- **Advisor Approved Electives:** 6 hours
- **Advisor Approved Sequence:** 12 hours
- **Research and Thesis Requirement:** 6 hours
- **Total Degree Requirements:** 30 hours

At least 21 of the above credit hours must be at the 6000 level.

The following are the core courses and course sequences required for Thesis option:

Core Required Coursework (6 hours)

- MATH 6110 - Abstract Algebra I Cr. 3.
- MATH 6010 - Functional Analysis I Cr. 3.
OR
- MATH 6410 - Real Analysis I Cr. 3.
OR
- MATH 6310 - Complex Analysis I Cr. 3.

Advisor Approved Electives (6 hours)

Selection of appropriate MATH advisor approved courses (MATH 5XXX-MATH 6XXX) will be made in consultation with the student's advisory committee and/or graduate coordinator.

Advisor Approved Sequence (12 hours)

A student may complete a sequence by taking any two of the six courses listed below. A student who takes four of the six courses listed is considered to have completed two sequences.

- MATH 6510 - Finite Difference Solutions of Partial Differential Equations Cr. 3.
- MATH 6520 - Finite Element Solutions of Partial Differential Equations Cr. 3.
- MATH 6810 - Partial Differential Equations Cr. 3.
- MATH 6530 - Integral Equations and Applications Cr. 3.

- MATH 6540 - Calculus of Variations and Applications Cr. 3.
- MATH 6610 - Operational Mathematics Cr. 3.

Student may choose additional sequences from the following list:

- MATH 6010 - Functional Analysis I Cr. 3. AND
- MATH 6020 - Functional Analysis II Cr. 3.
- MATH 6070 - Applied Linear Statistical Methods I Cr. 3. AND
- MATH 6080 - Applied Linear Statistical Methods II Cr. 3.
- MATH 6110 - Abstract Algebra I Cr. 3. AND
- MATH 6120 - Abstract Algebra II Cr. 3.
- MATH 6170 - Experimental Design I Cr. 3. AND
- MATH 6180 - Experimental Design II Cr. 3.
- MATH 6210 - Topology I Cr. 3. AND
- MATH 6220 - Topology II Cr. 3.
- MATH 6240 - Representations and Characters of Groups I Cr. 3. AND
- MATH 6250 - Representations and Characters of Groups II Cr. 3.
- MATH 6310 - Complex Analysis I Cr. 3. AND
- MATH 6320 - Complex Analysis II Cr. 3.
- MATH 6370 - Probability Theory and Stochastic Processes I Cr. 3. AND
- MATH 6380 - Probability Theory and Stochastic Processes II Cr. 3.
- MATH 6410 - Real Analysis I Cr. 3. AND
- MATH 6420 - Real Analysis II Cr. 3.
- MATH 6450 - Advanced Theory of Computation Cr. 3. AND
- MATH 6460 - Computational Methods for Graphics and Modeling Cr. 3.
- MATH 6910 - Special Topics in Mathematics Cr. 3. AND
- MATH 6920 - Special Topics in Mathematics Cr. 1-3.

Research and Thesis Requirement (6 hours)

- MATH 6990 - Research and Thesis Cr. 3,6.

Non-Thesis Option

The M.S. in Mathematics in the Non-Thesis program is a 33 hour program. Degree requirements are as follows:

- **Core Course Requirements:** 6 hours
- **Advisor Approved Electives:** 6 hours

- **Advisor Approved Sequence:** 18 hours
- **Non-Thesis Project:** 3 hours
- **Total Degree Requirements:** 33 hours

A comprehensive examination on two (2) of the three (3) one-year approved sequences used to fulfill the 18 credit hour requirement. The selection of the two (2) areas of examination will be left to the graduate student and to the graduate student's advisor, subject to the approval of the student's Graduate Advisory Committee. The exam will test both the student's knowledge of the subject areas and ability to independently solve problems and prove theorems.

At least 24 of the 33 hours will be at the 6000 level.

The following are the core courses and course sequences required for the Non-Thesis option:

Core Required Coursework (6 hours)

- MATH 6110 - Abstract Algebra I Cr. 3.
- MATH 6010 - Functional Analysis I Cr. 3.
OR
- MATH 6410 - Real Analysis I Cr. 3.
OR
- MATH 6310 - Complex Analysis I Cr. 3.

Advisor Approved Electives (6 hours)

Selection of appropriate MATH advisor approved courses (MATH 5XXX-MATH 6XXX) will be made in consultation with the student's advisory committee and/or graduate coordinator.

Advisor Approved Sequence (18 hours)

A student may complete a sequence by taking any two of the six courses listed below. A student who takes four of the six courses listed is considered to have completed two sequences.

- MATH 6510 - Finite Difference Solutions of Partial Differential Equations Cr. 3.
- MATH 6520 - Finite Element Solutions of Partial Differential Equations Cr. 3.
- MATH 6810 - Partial Differential Equations Cr. 3.
- MATH 6530 - Integral Equations and Applications Cr. 3.
- MATH 6540 - Calculus of Variations and Applications Cr. 3.
- MATH 6610 - Operational Mathematics Cr. 3.

Student may choose additional sequences from the following list:

- MATH 6010 - Functional Analysis I Cr. 3. AND
- MATH 6020 - Functional Analysis II Cr. 3.
- MATH 6070 - Applied Linear Statistical Methods I Cr. 3. AND
- MATH 6080 - Applied Linear Statistical Methods II Cr. 3.
- MATH 6110 - Abstract Algebra I Cr. 3. AND
- MATH 6120 - Abstract Algebra II Cr. 3.

- MATH 6170 - Experimental Design I Cr. 3. AND
- MATH 6180 - Experimental Design II Cr. 3.
- MATH 6210 - Topology I Cr. 3. AND
- MATH 6220 - Topology II Cr. 3.
- MATH 6240 - Representations and Characters of Groups I Cr. 3. AND
- MATH 6250 - Representations and Characters of Groups II Cr. 3.
- MATH 6310 - Complex Analysis I Cr. 3. AND
- MATH 6320 - Complex Analysis II Cr. 3.
- MATH 6370 - Probability Theory and Stochastic Processes I Cr. 3. AND
- MATH 6380 - Probability Theory and Stochastic Processes II Cr. 3.
- MATH 6410 - Real Analysis I Cr. 3. AND
- MATH 6420 - Real Analysis II Cr. 3.
- MATH 6450 - Advanced Theory of Computation Cr. 3. AND
- MATH 6460 - Computational Methods for Graphics and Modeling Cr. 3.
- MATH 6910 - Special Topics in Mathematics Cr. 3. AND
- MATH 6920 - Special Topics in Mathematics Cr. 1-3.

Non-Thesis Project (3 hours)

- MATH 6991 - Research and Independent Study Cr. 1-3.

Department of Physics

Stephen J. Robinson, Chairperson

Departmental Graduate Faculty: Paula Engelhardt, Adam T. Holley, Mary Frances Kidd, Raymond L. Kozub, Mustafa Moiz Rajabali, Stephen J. Robinson

No graduate degree is offered in Physics but courses may be used (with advisory committee approval) as electives in other fields of study.

Department of Sociology and Political Science

Lori Maxwell, Chairperson

Departmental Graduate Faculty: Lauren Howard Harding, Ada Haynes, Lori Maxwell, Gwendolyn Lachelle Norris

No degree is offered in Sociology or Criminal Justice but courses may be used (with advisory committee approval) as electives in other fields of study.

College of Business

Thomas H. Payne, Dean

Departmental Graduate Faculty: Robert Alley, , M. Meral Anitsal, Curtis P. Armstrong, Deborah Ballou, Sid Bundy, Ann Davis, Ferdinand Difurio, Dan Robert Fesler, Steve Garner, Tor Guimaraes, Alma Hales, Mary Howard, Brian Hugeuenard, Steven Isbell, Brian Jones, Hyewon Park, Wesley Pech, Julie M. Pharr, Rodley Pineda, Richard Rand, Robert Seay, Mark A. Stephens, Thomas Timmerman, Kyle Turner, F. Stuart Wells III, Kenneth Wiant, Robert Willbanks

Master of Accountancy

Master of Accountancy, M.Acc.

Departmental Mission

The Department holds separate AACSB Accounting Accreditation. Accordingly, our mission is "to graduate students characterized by a commitment to professional competence, ethical conduct, excellent communication skills, and critical thinking." Toward that end, we strive to provide students access to advanced knowledge in the field of accounting and we emphasize the importance of life-long learning and continuing professional development.

We strive to adhere to a set of values that embraces our commitment to a standard of excellence. Those values include:

- Integrity
- Professionalism
- Diversity of Thought
- Excellence
- Team Collaboration

The purposes of the MAcc Program at TTU include delivery of: (1) strong, masters-level education that provides accounting students with advanced academic knowledge, requisite professional skills, and a relevant, high-quality pathway to the profession and associated certifications", (2) high-quality programming that facilitates students' development and growth as successful, ethical business leaders, (3) appropriate graduate-level degree programming to meet the needs of aspiring professional accountants and their prospective employers that is not currently available to TTU accounting graduates, and (4) using online and associated technologies to increase Tennesseans' access to graduate accounting education.

Departmental Admission Requirements

Master of Accountancy Website

Tennessee Tech's AACSB-accredited Master of Accountancy (MAcc) program maintains an admission process that considers applicants' total academic and work-life achievements. The Master of Accountancy does not require the GMAT or GRE for admission to the program.

Pre-Requisites: Applicants must have an undergraduate degree in business with a major in Accounting (or the equivalent) from an accredited school or university, or be in their final semester of undergraduate

coursework. Accounting major equivalency can be achieved by presenting evidence of successful completion of two courses in Intermediate Financial Accounting and one course each in Cost Accounting, Taxation, and Auditing.

While it is not required, it is helpful if students have successfully completed at least one undergraduate course in business or accounting analytics.

To Apply: Visit the online application portal [Apply Here](#), create an account, complete the application, and upload the following required documents:

- Official transcripts from all institutions where you took classes or received a degree. You may provide copies of transcripts to speed the application process, but official transcripts will be needed to finalize admission.
- A current resume. Make sure your resume contains dates for all work experience and degrees received.

Factors that may be considered in the admission decision are:

- Undergraduate GPA*,
- Professional or Accounting Work Experience or Internships,
- Other Graduate Degrees and Relevant Achievements, and
- Significant leadership roles.

*Although not required, a strong score on the GMAT can be a positive factor in an admission decision for students with a GPA that is below our average GPA. We recommend that you consider preparing for and taking the GMAT if your undergraduate GPA is below 3.0. GMAT information is available at [GMAC - GMAT Assessment](#).

Note: Annually, the MAcc seeks to fill a cohort of 25-30 students each Fall term. Admission can be competitive. We advise you to submit your completed application and all required documentation as early as possible. We begin reviewing applications on January 31 each year.

Visit the Graduate Admissions Calendar for a complete list of application deadlines. MAcc admission is open to qualified students with a bachelor's degree and a major in accounting or coursework in accounting that gives students an academic foundation to be admitted into the MAcc program. The degree and coursework must be from an accredited institution. Consideration is given to the applicant's work experience and other activities that demonstrate potential for successful completion of the program.

Applications for admission are accepted for all semesters. Candidate screening and admission decisions will be made as applications are completed by the applicants.

Fast Track Program

Generally, the Fast Track program allows selected undergraduates to enroll for up to six (6) hours of graduate courses that will count at both the undergraduate and graduate level prior to formal admission to the MAcc program. Participation does not change the requirements for the student's undergraduate or MAcc program. Currently, the MAcc only allows students to Fast Track the six hours of electives in the MAcc program. Accounting courses (designated with the ACCT prefix) are not allowed to be Fast Tracked.

Admission to Fast-Track

Minimum requirements for admission are:

- 90 hours of undergraduate work in an AACSB accredited College of Business and successful completion of the required prerequisites

- Recommendation of a faculty member in the student's major
- Overall GPA of 3.2 and GPA of 3.2 in the student's major
- Program participants should consult with their future MAcc advisor regarding appropriate graduate courses to take during their junior/senior year.
- All requirements for full admission to Graduate School must be met upon graduation.
- Students who do not succeed in their first graduate course (B grade or better) will be advised to withdraw from the Fast Track program and complete their B.S. degree in a normal manner.

Fulfilling the above minimum requirements does not guarantee acceptance into the MAcc Fast Track program or the MAcc program. Students who meet the above minimum requirements must consult with the College of Business for eligibility and acceptance.

Minimum Retention Requirements

A MAcc student is required to maintain a cumulative grade average of at least B (3.0) in all courses taken for degree purposes. Not more than six (6) hours of credit below a B grade will be allowed. If a grade of C is assigned in a MAcc-related course, the course may be repeated. However, both the original grade and the grade for repeat will be counted in the cumulative average. A MAcc degree course may be repeated only one (1) time and no more than two (2) MAcc degree courses may be repeated. In addition, any student receiving a D or an F in a MAcc degree course shall be dismissed from the program.

Probation for Unsatisfactory Performance

A graduate student is required to maintain a cumulative grade point average of at least "B" on all graduate courses taken as a graduate student. When a student's cumulative average on courses falls below 3.0, but not less than 2.00, the student will be placed on probation. If the cumulative average falls below 2.00, the student will be dismissed.

If the term average, on all courses presented as part of the hours required for graduation, during any semester is less than 2.00, the student's record will be reviewed and the student may be placed on probation.

Accountancy Program Information

Degree Requirements

The 30-credit hour MAcc program was designed with two options, a 1-year track and a 2-year track. Due to the importance of completing the degree in a timely fashion and time limits established by the Tennessee Society of CPA's for completing the CPA Exam, it is important that the discipline of either a 1-year or 2-year timeline be imposed on applicants. The disciplined time-line will also contribute to lowering the attrition rate and increasing the likelihood of graduation.

The MAcc is a 100% online program with limited face-to-face interaction. While the coursework will be online, there is a provision in the program for two residency experiences. These residency experiences will be required components of the program and, combined with the online pre-work, will count for 1 credit hour each. Students will attend two live weekend sessions that will include group project work, group presentations, seminars and networking opportunities. The residency experiences will also provide vital "touch points" in the program that will allow students and faculty to communicate in a one-on-one exchange of thoughts and ideas related to the program and course materials.

The following are the MAcc degree requirements:

- **Core Required Courses:** 24 hours

- **Advisor Approved Electives:** 6 hours
- **Total Degree Requirement:** 30 hours

Core Course Requirements (24 hours)

The following courses are required as part of the MAcc degree program:

- ACCT 6210 - Corporate Tax Management and Research Cr. 3.
- ACCT 6220 - Auditing and Attestation Cr. 3.
- ACCT 6231 - Professional Certification: Business Environment and Concepts Cr. 1.
- ACCT 6232 - Professional Certification: Audit Cr. 1.
- ACCT 6233 - Professional Certification: Regulation Cr. 1.
- ACCT 6234 - Professional Certification: Financial Accounting and Reporting Cr. 1.
- ACCT 6240 - Ethics and the Professional Code of Conduct Cr. 1.
- ACCT 6250 - Governmental and Not-for-Profit/Healthcare Accounting Cr. 3.
- ACCT 6260 - Tax Management of Flow-Through Entities and Strategy Cr. 3.
- ACCT 6270 - Advanced Financial Accounting Cr. 3.
- ACCT 6281 - Professional Development I Cr. 1.
- ACCT 6282 - Professional Development II Cr. 1.
- ACCT 6290 - Essential Tech for Accountants Cr. 2.

Advisor Approved Electives (6 hours)

The advisor will approve six hours of elective credit. Students may use any 5000-level or 6000-level course offered by the College of Business, except ACCT6010, which cannot be used as a MAcc elective.

One and Two Year Completion Pathways

As stated earlier, the MAcc program is designed to provide two pathways for students to take in order to meet the student's academic goals and to fulfill the requirements of the CPA examination timelines. The following is the academic plan for each pathway:

1-Year Completion Pathway

Fall Term

- ACCT 6210 - Corporate Tax Management and Research Cr. 3.
- ACCT 6220 - Auditing and Attestation Cr. 3.
- ACCT 6231 - Professional Certification: Business Environment and Concepts Cr. 1.
- ACCT 6240 - Ethics and the Professional Code of Conduct Cr. 1.
- ACCT 6281 - Professional Development I Cr. 1.
- **Graduate Elective** Cr. 3. *

Spring Term

- ACCT 6260 - Tax Management of Flow-Through Entities and Strategy Cr. 3.
- ACCT 6270 - Advanced Financial Accounting Cr. 3.

- ACCT 6232 - Professional Certification: Audit Cr. 1.
- ACCT 6233 - Professional Certification: Regulation Cr. 1.
- ACCT 6282 - Professional Development II Cr. 1.
- **Graduate Elective** Cr. 3. *

Summer Term

- ACCT 6250 - Governmental and Not-for-Profit/Healthcare Accounting Cr. 3.
- ACCT 6290 - Essential Tech for Accountants Cr. 2.
- ACCT 6234 - Professional Certification: Financial Accounting and Reporting Cr. 1.

2-Year Completion Pathway

1st Fall Term

- ACCT 6210 - Corporate Tax Management and Research Cr. 3.
- **Graduate Elective** Cr. 3. *

1st Spring Term

- ACCT 6260 - Tax Management of Flow-Through Entities and Strategy Cr. 3.
- **Graduate Elective** Cr. 3. *

1st Summer Term

- ACCT 6290 - Essential Tech for Accountants Cr. 2.
- ACCT 6233 - Professional Certification: Regulation Cr. 1.

2nd Fall Term

- ACCT 6220 - Auditing and Attestation Cr. 3.
- ACCT 6231 - Professional Certification: Business Environment and Concepts Cr. 1.
- ACCT 6240 - Ethics and the Professional Code of Conduct Cr. 1.
- ACCT 6281 - Professional Development I Cr. 1.

2nd Spring Term

- ACCT 6270 - Advanced Financial Accounting Cr. 3.
- ACCT 6232 - Professional Certification: Audit Cr. 1.
- ACCT 6282 - Professional Development II Cr. 1.

2nd Summer Term

- ACCT 6250 - Governmental and Not-for-Profit/Healthcare Accounting Cr. 3.
- ACCT 6234 - Professional Certification: Financial Accounting and Reporting Cr. 1.

Master of Business Administration

Business Administration, Cyber Management and Analytics Certificate, M.B.A.

The Tennessee Tech MBA is fully accredited by AACSB International--the highest attainable level of accreditation. The MBA degree may be obtained completely online or through a combined online/on-campus program of study.

The MBA program offers the option for 100% online completion, in as little as one year. The online learning environment is highly interactive and incorporates case discussions, teamwork, simulations, and other active-learning approaches. MBA courses make a strong connection between academic subjects and the practical issues facing managers in today's globally competitive, high tech, and analytically-focused business environment.

MBA Admission Requirements

Tennessee Tech's AACSB-accredited Master of Business Administration (MBA) program maintains an admission process that considers applicants' total academic and work-life achievements. Admission is open to qualified students with a bachelor's degree from a regionally accredited institution. No GMAT or GRE test score is required to apply. Applications are accepted for fall, spring, and summer semester admission. Application deadlines are listed on the University's Graduate Studies webpage.

To Apply: Visit the online application portal [Apply Here](#), create an account, complete the application, and upload the following required documents

- A current resume, containing dates for all work experience and degrees received.
- Official transcripts from all institutions where classes were taken and/or a degree received. Factors that may be considered in the admission decision are:
 - Undergraduate GPA*
 - Professional Work Experience†
 - Graduate Degrees and Relevant Achievements¹

*Professional work experience is post-undergraduate professional or military experience and should be described on the applicant's resume.

¹Graduate degrees (e.g., MD, JD, MS, MA, PharmD, etc.) should be documented on the applicant's transcript(s) and denoted on the resume.

Timely application is important. Applicants are advised to submit their completed application and all required documentation early to be given full consideration for upcoming semesters. Visit the Graduate Admissions Calendar for a complete list of application deadlines.

Important to Note: Additional information is required by Graduate Studies for international students (see Graduate Studies website). A score of 550 (79 internetbased) on the TOEFL or a band score of 6.0 on the IELTS is required for all students whose native language is other than English. Students must be proficient in the use of word processing, spreadsheet, and presentation software including the integration of all three of the above.

Academic Background

The Tennessee Tech MBA welcomes applicants from all academic majors. An undergraduate business degree or prerequisite business courses are not required to be admitted to the program. In lieu of prerequisite coursework, the program provides a self-paced orientation experience that allows students to start the MBA with foundational knowledge. Further details about orientation arrive to accepted students in their admissions information packet.

Standing Upon Admission

Students may be admitted in Full Standing or with Provisional Standing. Admission in Full gives students the greatest flexibility in taking MBA courses. Students admitted provisionally must take ECON 6050 within the first nine (9) hours of their program and maintain a 3.0 GPA on the first nine (9) hours of MBA core content completed. Upon meeting these requirements, the provisional student will be moved to Full Standing.

Fast Track Program

Fast Track allows selected undergraduates to enroll for up to six (6) hours of graduate courses that will count at both the undergraduate and graduate level prior to formal admission to the MBA program. Once admitted to Fast Track, the student will be allowed to enroll in appropriate MBA courses in the senior year with the consent of the student's undergraduate advisor and the director of Graduate Business Programs. Participation does not change the requirements for the student's undergraduate or MBA program.

Admission to Fast-Track

Minimum requirements for admission are:

- 90 hours of undergraduate work or senior standing and successful completion of any required prerequisites
- Recommendation of a faculty member in the student's major
- Overall GPA of 3.2 and GPA of 3.2 in the student's major
- Program participants should consult with their future MBA advisor regarding appropriate graduate courses to take during their senior year.
- All requirements for full admission to Graduate School must be met upon graduation.
- Students who do not receive a grade of B or better in the fast-tracked course will be advised to withdraw from the Fast Track program and complete their B.S. degree as normal.

Fulfilling the above minimum requirements does not guarantee acceptance into the Master of Business Administration Fast Track program or the MBA program. Students who meet the above minimum requirements must consult with the College of Business for eligibility and acceptance.

MBA

The MBA program requires no prerequisites and is designed for college graduates regardless of major. In all organizations, career success and advancement requires knowledge of finance, marketing, accounting, information technology, analytics, and management. In addition, the teamwork, leadership, technological and communication skills along with the networking opportunities provided throughout the MBA experience add value for full time students, working professionals, and their current employers.

The Tennessee Tech MBA is a 30-hour program. It consists of eight 3-hour core courses (24 credit hours) and two 3-hour general electives (6 credit hours). Full-time students can complete the program in one (1) calendar year. Part-time students take courses at their preferred pace, often taking only one or two courses per term. Students have up to six (6) years to complete the program.

The MBA core consists of eight 3-hour common courses:

- Economics 6000 (ECON6000) -- Managerial Economics
- Accounting 6010 (ACCT6010) – Accounting Information for Management Decisions
- Finance 6020 (FIN6020) – Financial Management
- Economics 6050 (ECON6050) – Analytical Decision Making

- Marketing 6100 (MKT6100) – Strategic Marketing
- Business Management 6200 (BMGT6200) – Organizational Leadership
- Decision Sciences 6220 (DS6220) – Management of Information Technology
- Business Management 6950 (BMGT6950) – Business Strategy

The core courses provide technical and contextual knowledge as they develop students' managerial competence. In addition to assuring a working knowledge of primary business functions, these career-relevant courses provide opportunities to work individually and in teams through a variety of case studies, simulations, and research projects. The six (6) credit hours of electives are used to develop special competencies of interest to the student.

Certificate Tracks

For an additional 6-9 hours beyond the 30-hour MBA, interested students can add an industry-focused Graduate Certificate. There are four certificate options:

- Banking & Financial Services.
- Cyber Management & Analytics
- Health Care Informatics
- Agribusiness

Each certificate requires 15 hours of directed electives. For more information on electives that comprise each certificate, see Industry-Focused Certificates on the MBA website. Students may apply the six hours of electives that are part of the MBA toward a certificate then add on the additional courses to complete the certificate.

Quality of Work

An MBA student is required to maintain a cumulative grade average of at least B (3.0) on all courses taken for degree purposes, and must achieve a grade of B or better in BMGT 6950. Students must repeat BMGT 6950 until a grade of B or better is obtained. Other courses may be repeated at the discretion of the student, and both the original grade and the grade for the repeat will be counted in the cumulative average. Any student receiving a D or an F in an MBA degree course shall be dismissed from the program.

Business Administration Program Information

Degree Requirements

MBA with a Certificate

- **Core Required Courses:** 21 hours
- **Certificate Courses*:** 15 hours
- **Total:** 36 hours

*3 out of the 5 Certificate courses count as the 9 credits for the MBA approved electives.

As many as nine (9) semester hours may be transferred from other AACSB accredited schools. Credit will not be allowed for courses taken more than five (5) years prior to application to Tennessee Tech. Enrollment in required common courses requires the approval of the MBA Director. All core courses should be complete prior to any 6000-level work.

Note: Participants from the Graduate School of Banking at LSU or the Barrette School of Banking may, upon approval, substitute 6 hours of course credit towards the TTU MBA program.

Core Required Courses

- ACCT 6010 - Accounting Information for Management Decisions Cr. 3.
- BMGT 6200 - Organizational Leadership Cr. 3.
- BMGT 6950 - Business Strategy Cr. 3.
- DS 6220 - Management of Information Technology Cr. 3.
- ECON 6050 - Analytical Decision Making Cr. 3.
- ECON 6000 - Managerial Economics Cr. 3.
- FIN 6020 - Financial Management Cr. 3.
- MKT 6100 - Strategic Marketing Cr. 3.

Total Hours for Core Courses: 24

Certificate Requirements

- DS 6540 - Network Security Cr. 3.
- DS 6570 - Cyber Security Management Cr. 3.
- DS 6550 - Database Management Cr. 3.
- EMGT 6210 - Project Management 1 Cr. 3.
OR
- MAcc students ACCT 6290 - Essential Tech for Accountants Cr. 2.
- DS 6530 - Advanced Data Analytics Cr. 3.

Total Hours: 14 or 15

Business Administration, Financial Services Certificate, M.B.A.

Business Administration Program Information

Degree Requirements

MBA with a Certificate

- **Core Required Courses:** 21 hours
- **Certificate Courses*:** 15 hours
- **Total:** 36 hours

*3 out of the 5 Certificate courses count as the 9 credits for the MBA approved electives.

As many as nine (9) semester hours may be transferred from other AACSB accredited schools. Credit will not be allowed for courses taken more than five (5) years prior to application to Tennessee Tech. Enrollment in required common courses requires the approval of the MBA Director. All core courses should be complete prior to any 6000-level work.

Note: Participants from the Graduate School of Banking at LSU or the Barrette School of Banking may, upon approval, substitute 6 hours of course credit towards the TTU MBA program.

Core Required Courses

- ACCT 6010 - Accounting Information for Management Decisions Cr. 3.

- BMGT 6200 - Organizational Leadership Cr. 3.
- BMGT 6950 - Business Strategy Cr. 3.
- DS 6220 - Management of Information Technology Cr. 3.
- ECON 6050 - Analytical Decision Making Cr. 3.
- ECON 6000 - Managerial Economics Cr. 3.
- FIN 6020 - Financial Management Cr. 3.
- MKT 6100 - Strategic Marketing Cr. 3.

Total Hours for Core Courses: 24

Certificate Requirements

- DS 6540 - Network Security Cr. 3.
- DS 6570 - Cyber Security Management Cr. 3.
- FIN 6920 - Banking and Financial Services Cr. 3.
- MKT 6510 - Services Marketing Cr. 3.
- ACCT 4300 (5300) - Financial Statement Analysis Cr. 3.

Total Hours: 15

Business Administration, Health Care Informatics Certificate, M.B.A.

Business Administration Program Information

Degree Requirements

MBA with a Certificate

- **Core Required Courses:** 21 hours
- **Certificate Courses*:** 15 hours
- **Total:** 36 hours

*3 out of the 5 Certificate courses count as the 9 credits for the MBA approved electives.

As many as nine (9) semester hours may be transferred from other AACSB accredited schools. Credit will not be allowed for courses taken more than five (5) years prior to application to Tennessee Tech. Enrollment in required common courses requires the approval of the MBA Director. All core courses should be complete prior to any 6000-level work.

Note: Participants from the Graduate School of Banking at LSU or the Barrette School of Banking may, upon approval, substitute 6 hours of course credit towards the TTU MBA program.

Core Required Courses

- ACCT 6010 - Accounting Information for Management Decisions Cr. 3.
- BMGT 6200 - Organizational Leadership Cr. 3.
- BMGT 6950 - Business Strategy Cr. 3.
- DS 6220 - Management of Information Technology Cr. 3.

- ECON 6050 - Analytical Decision Making Cr. 3.
- ECON 6000 - Managerial Economics Cr. 3.
- FIN 6020 - Financial Management Cr. 3.
- MKT 6100 - Strategic Marketing Cr. 3.

Total Hours for Core Courses: 24

Certificate Requirements

- DS 6900 - Special Topics Cr. 3.
- DS 6570 - Cyber Security Management Cr. 3.
- ECON 6900 - Special Topics Cr. 3.
- EMGT 6210 - Project Management 1 Cr. 3.
- PRST 6570 - Public Health Cr. 3.

*PRST 6570 is an MPS course. PRST 6570 only counts as a certificate course and not an MBA elective.

Total Hours: 15

Business Administration, M.B.A.

Business Administration Program Information

Degree Requirements

As many as nine (9) semester hours may be transferred from other AACSB accredited schools. Credit will not be allowed for courses taken more than five (5) years prior to application to Tennessee Tech. Enrollment in required common courses requires the approval of the MBA Director. All core courses should be complete prior to any 6000-level work.

MBA

- **Core Required Courses:** 24 hours
- **Advisor Approved Electives:** 6 hours
- **Total:** 30 hours

Core Required Courses

- ACCT 6010 - Accounting Information for Management Decisions Cr. 3.
- BMGT 6200 - Organizational Leadership Cr. 3.
- BMGT 6950 - Business Strategy Cr. 3.
- DS 6220 - Management of Information Technology Cr. 3.
- ECON 6050 - Analytical Decision Making Cr. 3.
- ECON 6000 - Managerial Economics Cr. 3.
- FIN 6020 - Financial Management Cr. 3.
- MKT 6100 - Strategic Marketing Cr. 3.

Total Hours for Core Courses: 24

Elective Courses

Two (2) courses/six (6) semester hours must be selected based on the student's chosen curriculum, from the following courses:

- ACCT 4600 (5600) - Forensic Accounting and Fraud Accounting Cr. 3.
- ACCT 4300 (5300) - Financial Statement Analysis Cr. 3.
- ACCT 4320 (5320) - Advanced Managerial Accounting Cr. 3.
- ACCT 4700 (5700) - International Experience in Accounting Cr. 3.
- ACCT 6220 - Auditing and Attestation Cr. 3.
- ACCT 6900 - Special Topics Cr. 3.
- ACCT 4900 (5900) - Special Topics in Accounting Cr. 3.
- BMGT 6900 - Special Topics Cr. 3.
- DS 4125 (5125) - Computer Forensics and Investigations Cr. 3.
- DS 4900 (5900) - Special Topics in Decision Sciences Cr. 1-3.
- DS 6530 - Advanced Data Analytics Cr. 3.
- DS 6540 - Network Security Cr. 3.
- DS 6550 - Database Management Cr. 3.
- DS 6900 - Special Topics Cr. 3.
- Econ 4200 (5200) - Environmental Economics Cr. 3.
- ECON 4310 (5310) - Labor Economics Cr. 3.
- ECON 4510 (5510) - International Trade and Finance Cr. 3.
- ECON 4520 (5520) - Comparative Economic Systems Cr. 3.
- ECON 4530 (5530) - History of Economic Thought Cr. 3.
- ECON 4600 (5600) - Economic Growth & Development Cr. 3.
- ECON 4900 (5900) - Contemporary Economics Workshop Cr. 1-6.
- ECON 4640 (5640) - Econometrics Cr. 3.
- ECON 6900 - Special Topics Cr. 3.
- ECON 6920 - International Economics Cr. 3.
- FIN 6350 - Small and Micro-Cap Portfolio Management Cr. 3.
- FIN 6900 - Special Topics Cr. 3.
- FIN 6910 - Multinational Finance Cr. 3.
- LAW 6450 - Organizational Ethics Cr. 3.
- MBA 6830 - Business Consulting and Research Cr. 3.
- MBA 6840 - Field Research Project Cr. 1-3.
- MBA 6980 - International Experience Cr. 3.
- MKT 6500 - Advanced Marketing Analysis Cr. 3.
- MKT 6630 - Entrepreneurship and Small Business Management Cr. 3.
- MKT 6900 - Special Topics Cr. 3.
- MKT 6930 - International Marketing Cr. 3.

Total hours: 30

Certificate

Banking and Financial Services Certificate

Certificate Requirements

- DS 6530 - Advanced Data Analytics Cr. 3.
- DS 6570 - Cyber Security Management Cr. 3.
- FIN 6920 - Banking and Financial Services Cr. 3.
- MKT 6510 - Services Marketing Cr. 3.
- ACCT 4300 (5300) - Financial Statement Analysis Cr. 3.

Business Administration, Agribusiness Certificate, M.B.A.

The Agribusiness Certificate is designed for current or prospective graduate students who have completed a Bachelor of Science degree in Agriculture or related field. The Agribusiness Certificate consists of 15 hours of industry-relevant graduate course credit and may be acquired in conjunction with, or independent from, other graduate credentials- including the Master of Business Administration (MBA). If in conjunction with the MBA, 9 hours of (specifically directed) course credit may be counted toward both the MBA and the Agribusiness Certificate. Students will also have the option to focus their certificate by taking courses in finance and risk management or general agribusiness.

Core Required Courses

- ACCT 6010 - Accounting Information for Management Decisions Cr. 3.
- BMGT 6200 - Organizational Leadership Cr. 3.
- BMGT 6950 - Business Strategy Cr. 3.
- DS 6220 - Management of Information Technology Cr. 3.
- ECON 6050 - Analytical Decision Making Cr. 3.
- ECON 6000 - Managerial Economics Cr. 3.
- FIN 6020 - Financial Management Cr. 3.
- MKT 6100 - Strategic Marketing Cr. 3.

Total Hours for Core Courses: 24

Degree Requirements

MBA with a Certificate

- **Core Required Courses:** 21 hours
- **Certificate Courses*:** 15 hours
- **Total:** 36 hours

*3 out of the 5 Certificate courses count as the 9 credits for the MBA approved electives.

As many as nine (9) semester hours may be transferred from other AACSB accredited schools. Credit will not be allowed for courses taken more than five (5) years prior to application to Tennessee Tech. Enrollment in required common courses requires the approval of the MBA Director. All core courses should be complete prior to any 6000-level work.

Note: Participants from the Graduate School of Banking at LSU or the Barrette School of Banking may, upon approval, substitute 6 hours of course credit towards the TTU MBA program.

Certificate Requirements

The Agribusiness Certificate allows the student to choose one of two focus areas: Finance and Risk Management; or General Agribusiness.

Finance and Risk Management Focus

- AGBE 4110(5110) - Agricultural Futures Marketing and Options Cr. 3
 - AGBE 5400 - Agricultural Finance Cr. 3
 - ACCT 4300 (5300) - Financial Statement Analysis Cr. 3.
 - FIN 6920 - Banking and Financial Services Cr. 3.
- Plus 3 credit hours of graduate agricultural coursework

General Agribusiness Focus

- ECON 4120(5120) - Natural Resource Economics Cr. 3
 - AGBE 4130(5130) - Agricultural Policy Cr. 3
- or
- AGBE 4200(5200) - Agribusiness Statistics Cr. 3.
 - AGBE 5400 - Agricultural Finance Cr. 3
- Plus 3 credit hours of MBA economics coursework
Plus 3 credit hours of agricultural graduate coursework

Business Administration: Healthcare Informatics Certificate for MBA Students

Certificate Requirements

- DS 6900 - Special Topics Cr. 3.
 - DS 6570 - Cyber Security Management Cr. 3.
 - ECON 6900 - Special Topics Cr. 3.
 - EMGT 6210 - Project Management 1 Cr. 3.
 - PRST 6570 - Public Health Cr. 3.
- *PRST 6570 is an MPS course. PRST 6570 only counts as a certificate course and not an MBA elective.

Cyber Management and Analytics Certificate

Certificate Requirements

- DS 6530 - Advanced Data Analytics Cr. 3.
- DS 6540 - Network Security Cr. 3.
- DS 6550 - Database Management Cr. 3.
- DS 6570 - Cyber Security Management Cr. 3.
- EMGT 6210 - Project Management 1 Cr. 3. or for MAcc students
- ACCT 6290 - Essential Tech for Accountants Cr. 2.

College of Education

The College of Education offers a variety of graduate programs at the Master of Arts (M. A.), Specialist in Education (Ed. S.), and Doctorate (Ph.D.) degree levels. All professional education programs offered in the College are

accredited by the Council for the Accreditation of Educator Preparation (CAEP) and are designed to prepare teachers, school support personnel, and administrators for the elementary and secondary schools and other service provider agencies in the Upper Cumberland of Tennessee as well as other locations in the nation. The Ph.D. program will prepare leaders to work in schools, agencies, and universities.

- College of Education Information

Lisa Zagumny, Dean

Julie C. Baker, Associate Dean

Departments and Program Information

Department of Counseling and Psychology

Department of Counseling and Psychology Website

- Department of Counseling and Psychology Information

Stephanie Kazanas, Interim Department Chairperson

Departmental Graduate Faculty: Ellen Blaylock, Chris Burgin, Jann D. Cupp, Christina Dukes, Tammy L. Dukewich, Derrick Edwards, Angelica Galvan, Laura Haddock, Kevin Harris, Nicole Henniger, Kathryn Hermann-Turner, Stephanie Kazanas, Kathryn Kozak, Mark Loftis, Laura Yvonne Malone, Tony Michael, Brittney Phillips, Tabitha Schlatter, Dawn-Elise Snipes, Sandra Terneus, Wesley Webber, Marisa White, Zachary Wilcox, Matthew J. Zagumny

Departmental Overview

A primary purpose of the department is to offer strong academic programs in the preparation for a career in counseling and psychology. Graduate programs are offered at the Master of Arts, Specialist in Education, and Ph.D. levels. The MA and EdS in Counseling and Psychology offer a number of concentrations available in each of these programs. The degree programs in Counseling and Psychology each consist of a counseling concentration, appropriate cognate area, and a research component. Concentrations are available in:

- Psychology
- Clinical Mental Health Counseling (Master's level only)
- School Counseling
- School Psychology

The department also offers a Ph.D. in Counseling and Supervision.

- Counseling and Supervision, Ph.D.

Counseling and Psychology Fast Track Program

The Fast Track program is designed to enable Tennessee Tech undergraduates to accumulate up to six (6) credit hours of graduate coursework in Counseling and Psychology while still pursuing their undergraduate degree and to transition to the Counseling and Psychology graduate program smoothly, with accelerated completion.

Up to six (6) hours of graduate coursework can be used to satisfy both undergraduate and graduate degree requirements. These courses must be taken at Tennessee Tech University.

The minimum admission requirements for participating in the C&P Fast Track Program are:

- Enrolled as a Tennessee Tech undergraduate Psychology major with senior standing.
- Overall GPA of at least 3.0 or better.

- Approval from the student's undergraduate advisor and two other upper division psychology faculty at TTU who have been the student's instructor for at least one course at TTU.
- Course approval from C&P graduate faculty or graduate faculty advisor.
- All requirements for full admission to Graduate School must be met upon graduation.

Program participants should consult with their undergraduate and/or future graduate advisor regarding appropriate graduate courses to take and must earn a minimum grade of "B" in the graduate courses in order to apply them to their M.A. program of study. Students who do not succeed in their first graduate course during their senior year (B grade or better) will be advised to withdraw from the Fast Track program and complete their B.S. degree in a normal manner.

Fulfilling the above minimum requirements does not guarantee admission to the Fast Track program. Students who meet the above minimum admission requirements must apply to the Department for admission to the Fast Track program. The department's graduate committee will review the application and make a decision for approval.

Ph.D. Counseling and Supervision

Counseling and Supervision, Ph.D. Admission and Degree Requirements

Master of Arts Degree Admission Requirements

Students pursuing graduate study in the Department of Counseling and Psychology can select from among several concentrations that are designed to lead to licensure in the State of Tennessee or that lead to non-licensure degrees.

Admission Criteria

The Department offers admission to applicants who appear to have the highest potential for graduate study and who have the disposition to be successful in their concentration. The recommended admission requirements are:

1. A bachelor's degree from an accredited institution.
2. Satisfactory undergraduate grade point average, usually a minimum of 3.0 on a 4.0 scale.
3. Enough undergraduate training in psychology or related work experience to do graduate work in the chosen concentration.
4. Three acceptable letters of recommendation for graduate study from faculty members or other persons who have adequate knowledge of the applicant's professional qualities or potential for success as a graduate student.
5. Successful interview with faculty review committee with a focus on dispositional congruence, personal intent, and professional aspirations.
6. While not required, an applicant may submit GRE General Test (GRE) scores for consideration to address their aptitude for graduate-level academic work.

Satisfying recommended standards, however, does not guarantee your admission. Admission decisions are based on departmental review, using a combination of holistic factors, including an interview, letters of recommendation, academic history, and related work experience.

Students may be admitted with provisional status if they do not meet all of the criteria above but do meet the minimum requirements of the College of Graduate Studies and are approved for provisional status by the departmental admissions committee. Provisional status will limit students to a maximum of nine (9) hours before the departmental admissions committee makes a recommendation for full admission. To advance from provisional to full admission a student must earn a 3.0 GPA on the nine (9) semester hours of graduate study in the concentration and be approved by the departmental admissions committee.

Evidence of English Language Proficiency

All applicants from countries in which the official language is not English are required to submit evidence of proficiency in English equivalent to level 9 in FLS.

Specialist in Education Degree Admission Requirements

Students pursuing graduate study in the Department of Counseling and Psychology can select from among several concentrations that are designed to lead to licensure in the State of Tennessee or that lead to nonlicensure degrees.

Admission Criteria

The department offers admission to applicants who appear to have the highest potential for graduate study and who have the disposition to be successful in their concentration. The minimum admission requirements are:

A Master's degree from an accredited institution.

Satisfactory graduate grade point average of 3.5 on a 4.0 scale.

Enough graduate training in psychology to do advanced graduate work in the chosen concentration.

Three acceptable letters of recommendation for graduate study from faculty members or other persons who have adequate knowledge of the applicant's professional qualities or potential for success as a graduate student.

A score of 400 (old format) or 146 (new format) on the verbal portion, a 4.0 score on the analytical writing portion, and a preferred score of 400 (old format) or 140 (new format) quantitative portions of the General Record Examination (GRE).

Satisfying minimal standards, however, does not guarantee your admission. Admission decisions are based on departmental review, using a combination of factors, including an interview to evaluate relevant dispositions for professionals in the chosen concentration.

Students may be admitted with provisional status if they do not meet all of the criteria above but do meet the minimum requirements of the graduate school and are approved for provisional status by the departmental admissions committee. Provisional status will limit students to a maximum of nine hours before the departmental admissions committee makes a recommendation for full admission. To advance from provisional to full admission a student must earn a 3.0 GPA on the nine semester hours of graduate study in the concentration and be approved by the departmental admissions committee.

Evidence of English Language Proficiency

All applicants from countries in which the official language is not English are required to submit evidence of proficiency in English equivalent to level 9 in FLS.

Specialist in Education Degree General Requirements

The program of study leading to the Specialist in Education degree (Ed. S.) will be designed for each student so as to achieve proper balance between the experiences required for training as a specialist and those required for development as a professional working with others. The program will therefore be tailored to serve the needs and objectives of the individual student.

If a student lacks not more than 12 semester credits on the master's degree, the student may accumulate a maximum of 9 semester credits to be counted toward the Ed. S. degree provided the student (i) has been approved for tentative Ed. S. admission by the Graduate School, (ii) has a departmentally approved program of study, and (iii) fulfills all requirements for the master's degree within two (2) consecutive semesters.

A minimum of 30 semester hours beyond the master's degree, in approved upper-level courses, will be required in the Ed. S. program. At least 15 semester hours must be taken in courses numbered at the 7000 level; no course below the 6000 level shall be counted for credit unless written approval is obtained from the student's advisory committee, the chairperson of the department in which the student is majoring, and the Associate Dean of the College of Graduate Studies.

Although a thesis is not required in the specialist program, the student is expected to become well acquainted with research in the field of specialization and to demonstrate competence in research methodology. In order to satisfy these expectations, the student must earn at least three (3) semester hours in courses of a laboratory and/or field experience nature and three (3) semester hours in an independent study project.

Transfer and Other Credit

Each candidate for the Ed.S. degree must complete a minimum of 24 semester hours credit at Tennessee Technological University.

A maximum of six (6) semester hours of transferred work with a minimum grade of "B" in each course may be included in the student's program of study. Such work must have been completed at an accredited institution which offers the Master's, Specialist's and/or Doctor's Degree (for a list of accrediting agencies recognized, refer to the U.S. Department of Education website). Credit earned through correspondence or extension courses will not be accepted toward the Ed.S. Degree.

Credit by special examination is not permitted at the graduate level; however, special examinations to determine competency or proficiency in courses where credit has already been earned but is currently out-of-date may be permitted during a period of up to three (3) consecutive semesters immediately following the six-year time limitation. Special examinations may also be permitted to validate transfer credit, but the credit must be originally earned as graduate credit and not undergraduate credit.

Other Regulations

In addition to these specific requirements for the Specialist in Education Degree, all candidates will be expected to comply with general regulations of the Graduate School. (See Regulations and Degree Requirements in previous sections of this catalog.)

Doctor of Philosophy

Key features of this 48-hour doctoral degree program include: it is designed to meet CACREP standards; and places an emphasis on rural mental health issues.

The profile of an applicant for this program is a professional who: 1) holds a master's degree in counseling and has related professional experience; 2) is interested in furthering their career by pursuing opportunities in counselor education, supervision, program evaluation, and other advanced positions; and 3) is committed to effecting change in regional mental health issues such as addictions.

Admission Requirements

The Ph.D. in Counseling and Supervision is a terminal degree. The department offers admission to applicants who appear to have the highest potential for success and the appropriate disposition for counseling and supervision in the Ph.D. program.

The recommended admission requirements are:

- A 3.5 grade point average (GPA) from an accredited Master's level program in a counseling or closely related program. Preference will be given to individuals who graduated from a CACREP-accredited program.
- Official transcripts from an accredited undergraduate and graduate institution, as well as transcripts from any additional institutions of higher education attended.
- Three acceptable letters of recommendation for graduate study from either former faculty members or other persons with adequate knowledge of the applicant's professional qualities and/or potential for success in a Ph.D. program (faculty review committee reserves the right to determine suitability of the letters.)
- While not required, an applicant may submit GRE General Test (GRE) scores for consideration to address their aptitude for graduate-level academic work.
- An English proficiency equivalent of Level 9 in FLS (applicable to those applicants from countries in which the official language is other than English).
- Successful interview with the faculty review committee with a focus on dis-positional congruence, personal intent, and professional aspirations.

Counseling and Supervision, Ph.D.

Counseling and Supervision, Ph.D. Program Information

Degree Requirements

The Ph.D. in Counseling and Supervision is a 48 credit hour doctoral degree program. The program consists of three degree components: Counseling and Supervision Core Coursework; Research Coursework; and Dissertation Research.

- **Counseling and Supervision Core Coursework:** 21 hours
- **Research Core Coursework:** 18 hours
- **Dissertation Research:** 9 hours
- **Total Degree Requirements:** 48 hours

Note: Two prerequisite and/or support courses (PSY 6310 , PSY 6930) may be required as determined by the advisor.

Counseling and Supervision Core Coursework (21 hours)

- COUN 7320 - Advanced Group Counseling in Addiction and Special Populations Credits. 3.
- COUN 7370 - Counseling Supervision Cr. 3.
- COUN 7400 - Advanced Counseling Practicum Credits. 3.
- COUN 7500 - Research, Scholarship, and Publication Credits. 3.
- COUN 7610 - Teaching in Counselor Education Credits 3.
- COUN 7700 - Advanced Multicultural Counseling: Leadership and Advocacy Credit. 3.
- COUN 7840 - Regional Mental Health and Addiction Services Credits. 3.

Research Core Coursework (18 hours)

- PSY 7310 - Advanced Educational Statistics Cr. 3.
- COUN 7510 - Counseling Administration and Program Evaluation Credits. 3.
- COUN 7730 - Qualitative Research Methods in Counseling Credits. 3.
- COUN 7740 - Advanced Quantitative Inquiry and Research Design Credit. 3.
OR
- COUN 7750 - Advanced Qualitative Inquiry and Research Design Credits. 3.
- COUN 7820 - Doctoral Internship Credits. 3. *
*6 credit hour requirement. Students must take COUN 7820 over two semesters (6 credit hours) rather than one (3 credit hours).

Advisor Guided Electives

Research core requirements include an option of one elective. Electives may be taken in the COUN or PSY areas at the 6000 or 7000 level.

Dissertation Research (9 hours)

Nine (9) credit hour minimum. Ph.D. candidates may take more than the 9 credit hour minimum as necessary to successfully complete their dissertation research.

- COUN 7990 - Dissertation Research Credits. 1-9 variable credit hours. *
- * 9 credit hour requirement.

Prerequisite Courses (6 hours)

The advisor will determine if prerequisite courses are required.

- PSY 6310 - Educational Statistics Cr. 3.
- PSY 6930 - Interpreting and Applying Psychological Research Cr. 3.

Master of Arts

Counseling and Psychology, Clinical Mental Health Counseling Concentration, M.A.

Degree Requirements

The Master of Arts degree in Counseling and Psychology is designed to prepare students for exciting and challenging careers. Concentration areas include: Clinical Mental Health Counseling, Psychology, School Counseling, and School Psychology. The program consists for core counseling courses, core non-counseling courses, guided electives and core concentration courses.

Clinical Mental Health Concentration and the School Counseling Concentration consists of 60 hours. Students may also pursue Dual Licensure by adding an 18-hour Ed.S. degree in Clinical Mental Health Counseling or School Counseling.

School Psychology Concentration consists of 33-36 hours.

- **Counseling Core Required Courses:** 30 hours
- **Non-Counseling Core Required Courses:** 6 hours
- **Advisor Guided Electives:** 9 hours
- **Concentration Core Courses:** 15 hours
- **Total Degree Requirement:** 60 hours

Counseling Core Required Courses (30 hours)

- COUN 6000 - Counseling Across the Lifespan Cr. 3.
- COUN 6300 - Introduction to Counseling: Foundations, Ethics, and Legal Issues Cr. 3.
- COUN 6320 - Group Counseling Cr. 3.
- COUN 6360 - Counseling Skills Cr. 3.
- COUN 6362 - Counseling Theories Cr. 3.
- COUN 6380 - Multicultural Counseling Cr. 3.
- COUN 6410 - Career Counseling and Development Cr. 3.
- COUN 6670 - Assessment in Counseling Cr. 3.

- COUN 6680 - Trauma, Grief, and Crisis Counseling Cr. 3.
- COUN 6800 - Practicum Cr. 3.

Non-Counseling Core Required Courses (6 hours)

- PSY 6310 - Educational Statistics Cr. 3.
- PSY 6930 - Interpreting and Applying Psychological Research Cr. 3.

Advisor Guided Electives (9 hours)

Selection of appropriate courses (PSY 5XXX-PSY 7XXX, and COUN 5XXX-COUN 7XXX) will be made in consultation with the student's advisory committee and/or the graduate coordinator.

Concentration Core Requirements (15 hours)

- COUN 6370 - Family Counseling Cr. 3.
- COUN 6460 - Addiction Counseling Cr. 3.
- COUN 6820 - Internship in Mental Health Counseling Cr. 3, 6.
- COUN 6821 - Internship in Mental Health Counseling Cr. 3, 6.
- COUN 7600 - Diagnosis and Treatment Cr. 3.

Course Substitutions

Course Substitutions are allowed upon approval of the graduate advisory committee, department chair/director, and dean of the college.

Counseling and Psychology, Psychology Concentration, M.A.

Degree Requirements

The M.A. in Counseling and Psychology includes a concentration in Psychology. Students will choose between Plan I or Plan II. This program consists of 30 hours.

Plan I

- **PSY 5000 level Advisor Guided Electives:** 0-9 hours
- **PSY 6000/7000 level Advisor Guided Electives:** 6-21 hours
- **Plan I Course Requirements (listed below):** 9 hours
- **Total Degree Requirements:** 30 hours

Plan II - Thesis

- **PSY 5000 level Advisor Guided Electives:** 0-9 hours
- **PSY or COUN 6000/7000 level Advisor Guided Electives:** 6-21 hours
- **Plan II Course Requirements (listed below):** 6 hours
- **Research and Thesis PSY 6990:** 6-9 hours
- **Total Degree Requirement:** 30 hours

Advisor Guided Electives (9 hours)

Selection of appropriate courses (PSY 5XXX-PSY 7XXX, and COUN 5XXX-COUN 7XXX) will be made in consultation with the student's advisory committee and/or the graduate coordinator.

Plan I Course Requirements

- PSY 6310 - Educational Statistics Cr. 3.
OR
- PSY 7310 - Advanced Educational Statistics Cr. 3.
- PSY 6930 - Interpreting and Applying Psychological Research Cr. 3.
- Plus 3 hours of Advisor Guided Electives Cr. 3.

Plan II Course Requirements

- PSY 6310 - Educational Statistics Cr. 3.
OR
- PSY 7310 - Advanced Educational Statistics Cr. 3.
- FOED 6920 - Educational Research Cr. 3.
OR
- PSY 7900 - Independent Study in Educational Psychology Cr. 3.

Course Substitutions

Course Substitutions are allowed upon approval of the graduate advisory committee, department chair/director, and dean of the college.

Counseling and Psychology, School Counseling Concentration, M.A.

Degree Requirements

The Master of Arts degree in Counseling and Psychology is designed to prepare students for exciting and challenging careers. Concentration areas include: Clinical Mental Health Counseling, Psychology, School Counseling, and School Psychology. The program consists for core counseling courses, core non-counseling courses, guided electives and core concentration courses.

Clinical Mental Health Concentration and the School Counseling Concentration consists of 60 hours. Students may also pursue Dual Licensure by adding an 18-hour Ed.S. degree in Clinical Mental Health Counseling or School Counseling.

School Psychology Concentration consists of 33-36 hours.

- **Counseling Core Required Courses:** 30 hours
- **Non-Counseling Core Required Courses:** 6 hours
- **Advisor Guided Electives:** 9 hours
- **Concentration Core Courses:** 15 hours
- **Total Degree Requirement:** 60 hours

Counseling Core Required Courses (30 hours)

- COUN 6000 - Counseling Across the Lifespan Cr. 3.
- COUN 6300 - Introduction to Counseling: Foundations, Ethics, and Legal Issues Cr. 3.
- COUN 6320 - Group Counseling Cr. 3.
- COUN 6360 - Counseling Skills Cr. 3.
- COUN 6362 - Counseling Theories Cr. 3.
- COUN 6380 - Multicultural Counseling Cr. 3.
- COUN 6410 - Career Counseling and Development Cr. 3.
- COUN 6670 - Assessment in Counseling Cr. 3.
- COUN 6680 - Trauma, Grief, and Crisis Counseling Cr. 3.
- COUN 6800 - Practicum Cr. 3.

Non-Counseling Core Required Courses (6 hours)

- PSY 6310 - Educational Statistics Cr. 3.
- PSY 6930 - Interpreting and Applying Psychological Research Cr. 3.

Advisor Guided Electives (9 hours)

Selection of appropriate courses (PSY 5XXX-PSY 7XXX, and COUN 5XXX-COUN 7XXX) will be made in consultation with the student's advisory committee and/or the graduate coordinator.

Concentration Core Courses (15 hours)

School Counseling follows the same Counseling Core Course Requirements, Non-Counseling Core Requirements, and Advisor Guided Electives as listed above for Clinical Mental Health Counseling. The two programs differ by concentration courses.

- COUN 6330 - Organization and Administration in School Counseling Programs Cr. 3.
- COUN 6335 - Professional Issues in the Educational Settings Cr. 3.
- COUN 6385 - Counseling Children and Adolescents Cr. 3.
- COUN 6830 - Internship in School Counseling Cr. 3, 6.
- COUN 7830 - Internship in School Counseling Cr. 3, 6.

Course Substitutions

Course Substitutions are allowed upon approval of the graduate advisory committee, department chair/director, and dean of the college.

Counseling and Psychology, School Psychology Concentration, M.A.

Degree Requirements

The MA in Counseling and Psychology with a concentration in School Psychology is a 33-36 hour non-licensure option. Degree requirements include:

Plan I

- **Required Core Courses:** 24 hours
- **Plan I Required Courses:** 12 hours
- **Total Degree Requirement Plan I:** 36 hours

Plan II

- **Required Core Courses:** 24 hours
- **Plan II Required Courses:** 9 hours
- **Total Degree Requirement Plan II:** 33 hours

Note: The School Psychology Concentration may require 15 hours of background courses. See your advisor to discuss the addition of background courses to your program hours.

Required Core Courses (24 hours)

- PSY 4160 (5160) - Abnormal Psychology Cr. 3.
- PSY 7730 - Individual Testing Cr. 3.
- PSY 7200 - Advanced Educational Psychology Cr. 3.
- COUN 6300 - Introduction to Counseling: Foundations, Ethics, and Legal Issues Cr. 3.
- COUN 6320 - Group Counseling Cr. 3.
- COUN 6360 - Counseling Skills Cr. 3.
- COUN 6362 - Counseling Theories Cr. 3.
- COUN 6800 - Practicum Cr. 3.

Required Courses: Plan I (12 hours)

The following courses are required for a student selecting Plan I of the School Psychology concentration.

- PSY 6310 - Educational Statistics Cr. 3.
OR
- PSY 7310 - Advanced Educational Statistics Cr. 3.
- FOED 6920 - Educational Research Cr. 3.
OR
- PSY 7900 - Independent Study in Educational Psychology Cr. 3.
- PSY 6990 - Research and Thesis Cr. 1-9.

Required Courses: Plan II (9 hours)

Students enrolling in Plan II of the School Psychology concentration must take the following courses (6 hours) and also select one additional advisor recommended elective (3 hours).

- PSY 6310 - Educational Statistics Cr. 3.
OR
- PSY 7310 - Advanced Educational Statistics Cr. 3.
- PSY 6930 - Interpreting and Applying Psychological Research Cr. 3.

School Psychology Concentration Background Courses

Your advisor will determine what background courses you may need for the degree program. Typically the following background courses are required:

- PSY 4050 (5050) - Learning and Cognition Cr. 3.
- PSY 4100 (5100) - Child Psychology Cr. 3.
- PSY 4150 (5150) - Psychology of Personality Cr. 3.
- PSY 4200 (5200) - Adolescent Psychology Cr. 3.
- PSY 4250 (5250) - Introduction to Psychological Testing Cr. 3.

Specialist in Education

Admission

Ed.S. Degree Admission Criteria

Students pursuing graduate study in the Department of Counseling and Psychology can select from among several concentrations that are designed to lead to licensure in the State of Tennessee or that lead to nonlicensure degrees.

Admission Criteria

The department offers admission to applicants who appear to have the highest potential for graduate study and who have the disposition to be successful in their concentration.

The minimum admission requirements are:

- A Master's degree from an accredited institution.
- Satisfactory graduate grade point average of 3.5 on a 4.0 scale.
- Enough graduate training in psychology to do advanced graduate work in the chosen concentration.
- Three acceptable letters of recommendation for graduate study from faculty members or other persons who have adequate knowledge of the applicant's professional qualities or potential for success as a graduate student.
- Successful interview with the faculty review committee with a focus on dispositional congruence, personal intent, and professional aspirations.
- While not required, an applicant may submit GRE General Test (GRE) scores for consideration to address their aptitude for graduate level academic work.
- Satisfying minimal standards, however, does not guarantee your admission. Admission decisions are based on departmental review, using a combination of holistic factors, including an interview, letters of recommendation, academic history, and related work experience.
- Students may be admitted with provisional status if they do not meet all of the criteria above but do meet the minimum requirements of the graduate school and are approved for provisional status by the departmental admissions committee. Provisional status will limit students to a maximum of nine hours before the departmental admissions committee makes a recommendation for full admission. To advance from provisional to full admission a student must earn a 3.0 GPA on the nine semester hours of graduate study in the concentration and be approved by the departmental admissions committee.

Evidence of English Language Proficiency

All applicants from countries in which the official language is not English are required to submit evidence of proficiency in English equivalent to level 9 in FLS.

Counseling and Psychology, Clinical Mental Health Counseling Concentration, Ed.S.

Degree Requirements

A minimum of 30 semester hours beyond the master's degree is required. At least 15 semester hours must be taken in courses numbered at the 7000 level and no courses below the 6000 level shall be counted for credit unless written approval is obtained from the student's advisory committee, the chairperson of the department in which the student is majoring, and the Director of Graduate Studies.

In the Department of Counseling and Psychology, a maximum of three (3) semester hours of departmentally approved 5000-level credit may be included in a Specialist in Education Degree program of study.

Upon approval from the student's advisory committee, up to twelve (12) credit hours from a previously earned 60 hour master's degree program, can be counted toward the Ed.S. degree.

Concentration Requirements

The Ed.S. in Clinical Mental Health Counseling consists of 15 guided electives plus 15 credit hours of concentration course blocks as defined below.

Students who have completed a 60 hour Master's degree in counseling only need to complete one of the 18 hour blocks below that they have not already completed in their Master's degree.

- **Required Concentration Courses:** 15 hours
- **Advisor Guided Electives:** 15 hours
- **Total Degree Requirement:** 15 hours

Required Concentration Courses (15 hours)

- COUN 6370 - Family Counseling Cr. 3.
- COUN 6460 - Addiction Counseling Cr. 3.
- COUN 6820 - Internship in Mental Health Counseling Cr. 3, 6.
- COUN 6821 - Internship in Mental Health Counseling Cr. 3, 6.
- COUN 7600 - Diagnosis and Treatment Cr. 3.

Advisor Guided Electives

Students, at the advice of their advisor and/or committee, may take 5000, 6000, or 7000 level courses from the following subject list. (Note that there is a limit of 9 credit hours at the 5000 level.)

- AGED - Agriculture Education
- CTE - Career Technical Education
- CFS - Child and Family Studies
- CUED - Curriculum Education
- ECED - Early Childhood Education
- ECSP - Early Childhood Special Education
- ELED - Elementary Education
- ESLP - English as a Second Language Pedagogy
- FOED - Foundations of Education
- INSL - Instructional Leadership

- LSCI - Library Science
- READ - Reading
- SEED - Secondary Education
- SPED - Special Education
- ABAP - Applied Behavioral Analysis
- EDU - Education
- EDUB - Behavior
- EDUC - Young Children
- EDUL - Literacy
- EDUP - Program Planning & Evaluation
- EDUS - STEM Education
- CSED - Computer Science Education
- ESOL - English as a Second or Other Language
- SVCL - Service Learning
- EXPW - Exercise, Physical Education and Wellness
- HEC - Human Ecology
- MUS - Music
- MUED - Music Education
- EDUH - Health Behavior/Wellness Education

Course Substitutions

Course Substitutions are allowed upon approval of the graduate advisory committee, department chair/director, and dean of the college.

Counseling and Psychology, School Counseling Concentration, Ed.S.

Counseling and Psychology EdS Program Information

Degree Requirements

A minimum of 30 semester hours beyond the master's degree is required. At least 15 semester hours must be taken in courses numbered at the 7000 level and no courses below the 6000 level shall be counted for credit unless written approval is obtained from the student's advisory committee, the chairperson of the department in which the student is majoring, and the Director of Graduate Studies.

In the Department of Counseling and Psychology, a maximum of three (3) semester hours of departmentally approved 5000-level credit may be included in a Specialist in Education Degree program of study.

Upon approval from the student's advisory committee, up to twelve (12) credit hours from a previously earned 60 hour master's degree program, can be counted toward the Ed.S. degree.

Concentration Requirements

The Ed.S. program in School Counseling consists of 15 guided electives plus 15 credit hours in the required concentration courses. Students who have completed a 60 hour Master's program in counseling only need to complete the 18 credit hours below that they have not already completed in their Master's degree.

- **Required Concentration Courses:** 15 hours
- **Advisor Guided Electives:** 15 hours
- **Total Requirements:** 30 hours

Required Concentration Courses (15 hours)

- COUN 6385 - Counseling Children and Adolescents Cr. 3.
- COUN 6330 - Organization and Administration in School Counseling Programs Cr. 3.
- COUN 6335 - Professional Issues in the Educational Settings Cr. 3.
- COUN 6830 - Internship in School Counseling Cr. 3, 6.
- COUN 7830 - Internship in School Counseling Cr. 3, 6.

Advisor Guided Electives

Students, at the advice of their advisor and/or committee, may take 5000, 6000, or 7000 level courses from the following subject list. (Note that there is a limit of 9 credit hours at the 5000 level.)

- AGED - Agriculture Education
- CTE - Career Technical Education
- CFS - Child and Family Studies
- CUED - Curriculum Education
- ECED - Early Childhood Education
- ECSP - Early Childhood Special Education
- ELED - Elementary Education
- ESLP - English as a Second Language Pedagogy
- FOED - Foundations of Education
- INSL - Instructional Leadership
- LSCI - Library Science
- READ - Reading
- SEED - Secondary Education
- SPED - Special Education
- ABAP - Applied Behavioral Analysis
- EDU - Education
- EDUB - Behavior
- EDUC - Young Children
- EDUL - Literacy
- EDUP - Program Planning & Evaluation
- EDUS - STEM Education
- CSED - Computer Science Education
- ESOL - English as a Second or Other Language
- SVCL - Service Learning
- EXPW - Exercise, Physical Education and Wellness
- HEC - Human Ecology
- MUS - Music
- MUED - Music Education
- EDUH - Health Behavior/Wellness Education

Course Substitutions

Course Substitutions are allowed upon approval of the graduate advisory committee, department chair/director, and dean of the college.

Counseling and Psychology, School Psychology Concentration, Ed.S.

Counseling and Psychology EdS Program Information

Degree Requirements

A minimum of 30 semester hours beyond the master's degree is required. At least 15 semester hours must be taken in courses numbered at the 7000 level and no courses below the 6000 level shall be counted for credit unless written approval is obtained from the student's advisory committee, the chairperson of the department in which the student is majoring, and the Director of Graduate Studies.

In the Department of Counseling and Psychology, a maximum of three (3) semester hours of departmentally approved 5000-level credit may be included in a Specialist in Education Degree program of study.

Upon approval from the student's advisory committee, up to twelve (12) credit hours from a previously earned 60-hour master's degree program, can be counted toward the Ed.S. degree.

Concentration Requirements

The Ed.S. concentration in School Psychology is a 30-hour program and consists of 9 required courses as defined below. However, additional courses may be required for the School Psychologist Endorsement.

- **Required Concentration Courses:** 30 hours.

Required Concentration Courses

- CUED 6010 - Curriculum Development and Evaluation Cr. 3.
- FOED 7020 - Philosophy and Public Policy Cr. 3.
- PSY 7170 - Consultation in the Education Setting Cr. 3.
- PSY 7310 - Advanced Educational Statistics Cr. 3.
- PSY 7610 - Introduction to Personality Assessment Cr. 3.
- PSY 7900 - Independent Study in Educational Psychology Cr. 3.
- PSY 7910 - Assessment and Intervention Cr. 3.
- PSY 7920 - Assessment and Intervention Cr. 3.
- PSY 7950 - Internship in School Psychology Cr. 3. *

* Two courses of three semester hours each, taken over two semesters, for a total of 1200 clock hours.

Course Substitutions

Course Substitutions are allowed upon approval of the graduate advisory committee, department chair/director, and dean of the college.

Department of Curriculum and Instruction

Departmental Overview

The department of Curriculum and Instruction offers graduate degrees at the master, specialist, and doctoral level. Each degree program offers a variety of concentration areas and licensure opportunities. In addition to the three degree programs managed by the department of Curriculum and Instruction, the department directs the Instructional Leadership degree program that houses the master and specialist in Instructional Leadership.

Curriculum and Instruction Graduate Admissions

Curriculum and Instruction, Ed.S. Program Information

Curriculum and Instruction, M.A. Program Information

Curriculum and Instruction BS/MA Fast Track Program

The Fast Track program is designed to enable TTU undergraduates to accumulate up to six (6) credit hours of graduate coursework, to satisfy both undergraduate and graduate degree requirements, while still pursuing their undergraduate degree. The coursework would enable an efficient graduate program transition with the potential for accelerated completion. The courses must be taken at Tennessee Tech University.

The minimum admission requirements for participating in the C&I Fast Track Program are:

- Enrolled as a TTU undergraduate with at least 90 hours of completed courses or Spring semester of Junior year within their program of study.
- Overall GPA of at least 3.25 or better
- Recommendation from the student's undergraduate advisor
- Course approval from C&I graduate faculty or graduate faculty advisor.

Program participants should consult with their undergraduate and/or future graduate advisor regarding appropriate graduate courses to take and must earn a minimum grade of "B" in the graduate courses in order to apply them to their M.A. program of study. Students who do not succeed in their first graduate course (B grade or better) will be advised to withdraw from the Fast Track program and complete their B.S. degree in a normal manner.

Fulfilling the above minimum requirements does not guarantee admission to the Fast Track program. Students who meet the above minimum admission requirements must apply to the Department for admission to the Fast Track program. The department's graduate committee will review the application and make a decision for approval.

In addition to the requirements for admission to the Fast-track BS/MA program, all requirements for admission to the graduate program must also be met upon graduation. Meeting these minimum requirements does not guarantee admission to the graduate program.

Admission to Candidacy

Students in both the M.A. and Ed.S. programs must complete the CITI Program: Research, Ethics, and Compliance Training as a requirement for admission to candidacy.

Comprehensive Examination

Completion of CUED 6305 or CUED 6315 or CUED 7910 will meet the requirements for the comprehensive exams and satisfy graduate school requirements for all M.A. and Ed.S. programs in the department.

Teacher Licensure

In addition to the 33-credit hour Master's degree program, many students within Curriculum and Instruction add a teaching license which may include an additional 17 credit hours of coursework. Upon admittance to the Teacher Education Program, a customized program of study will be developed for the appropriate licensure program.

Concentration	Licensure
Early Childhood Education	Early Childhood
Early Childhood Education	Lic Special Education Early Childhood
Elementary Education	Elementary Education K-5
Library Science	Library Information Specialist
Secondary Education	English 6-12
Secondary Education	Biology 6-12
Secondary Education	Chemistry 6-12
Secondary Education	Earth Science 6-12
Secondary Education	Math 6-12
Secondary Education	Math 6-8
Secondary Education	Physics 6-12
Secondary Education	History/Geography/Government/Economics/Social Studies, 6-12
SPED	Lic SE Comprehensive
SPED	Lic SE Interventionist K-8
SPED	Lic SE Interventionist Biology 6-12
SPED	Lic SE Interventionist English 6-12
SPED	Lic SE Interventionist History 6-12
SPED	Lic SE Interventionist Math 6-12

Jeremy Wendt, Chairperson

Departmental Graduate Faculty: Ashley Akenson, James Akenson, Holly Anthony, Jane Baker, Julie Baker, Jason Beach, Amy Callendar, George Chitiyo, Danielle Collins, Melissa Comer, Cindy Conley, Perihan Fidan, Yvette Freter, Rebecca Garrett, Chester Goad, Cory Gleasman, Ka Rene Grimes, Kimberly Hale, Martha Howard, Janet Isbell, Patricia Jones, Krystal Kennedy, Nancy Kolodziej, Elizabeth Lackey, Michael Littrell, Delia Ann Manginelli, Rebekah Marcum, Jennifer Meadows, Kelly Moore, Queen Ogbomo, Miguel Perez Montoro, Darek Potter, Amanda Roberts, Amy Leigh Rogers, Kyle Shanks, Michael Shuran, Dorota Silber-Furman, Matthew Smith, Sandi Smith-Andrews, Amber Spears, Julie Stepp, Leslie Suters, Frances Taylor, Paula Taylor-Greathouse, Kristen Trent, Sara Wehrmann, Jeremy Wendt, Stephanie Wendt, Lisa Zagumny

Doctor of Philosophy

Exceptional Learning Ph.D.

Ashley B. Akenson, Ph.D., Director

The Exceptional Learning Ph.D. (ELPhD) program focuses on the characteristics, strengths, and educational needs of individuals and groups whose learning potential and opportunities for success are frequently unrealized. Exceptional populations include people for whom social, economic, and physical characteristics may serve as a barrier to development and learning.

The ELPhD program offers robust academic preparation of professionals who serve their communities, public school systems, institutions of higher education, and nontraditional educational environments. Our graduates are leaders who work across local, regional, national, and international platforms to effect positive change in diverse populations of exceptional learners and educational contexts, addressing barriers to learning, primarily through research and service activities.

The ELPhD curriculum is organized around three areas of knowledge development-core, concentration, and research. Core knowledge includes an orientation to the program, theory, foundations for understanding exceptional populations, program planning and evaluation, and technology. Concentration knowledge helps students to deepen and hone their specific interests. The innovative research sequence grounds students in quantitative and qualitative research methodologies.

Five concentrations and two tracks allowing students to focus on specific areas of professional and research interests:

Applied Behavior Analysis prepares professionals who can develop and deliver behavioral interventions and supports for individuals within educational and habilitative settings. There are two ABA tracks:

Young Children and Families prepares professionals to provide support and interventions to young, at-risk children and families with emphasis on building relationships and advocating for children and families. (Track Leader – Dr. Jane Baker)

School-Aged Children and Adult Populations prepares professionals who will implement and provide empirical support for behavioral interventions for a range of populations and pursue board certification as a

behavior analyst. The ABAS course sequence is approved by the national Behavior Analyst Certification Board (BACB).(Track leader – Dr. Krystal Kennedy)

Health Behaviors and Wellness Education (HBWE) offers cutting-edge, hands-on experiential courses along with related pedagogical methods and theory. HBWE research courses supply additional opportunities to research and address discipline-specific concerns. This comprehensive and novel design supplies students with the knowledge, skills, and abilities necessary to succeed professionally and lead change in health sciences and wellness disciplines. (Concentration Leader – Dr. Christy Killman)

Literacy empowers educational innovators to develop cutting-edge, socially conscious approaches to multiliteracies and challenge narrow conceptions of learners, families, and worldviews. (Concentration Leader – Dr. Janet Isbell)

Program Planning and Evaluation (PPE) prepares professionals for leadership roles in the field of PPE. Program content includes the history of the field, influence in context and cultures in PPE design and methodology, quantitative and qualitative methods, and practical application of PPE skills through practicum experiences. (Concentration Leader – Dr. George Chitiyo)

STEM Education builds the capacity of innovative educational leaders to advance new ideas and to design/implement strategic innovations in science, technology, engineering, and mathematics (STEM) education. (Concentration Leader – Dr. Holly Anthony)

Admission Requirements

A multifaceted approach is taken in the application and admissions decisions process. The applicant will be evaluated on the criteria listed below in order to determine the applicant's overall potential for success in the ELPhD program. Please note, however, that fulfillment of the minimum requirements *does not* guarantee admission.

1. **QPA**—Consideration for admission to the program is based on the applicant's grade point average (GPA) in the last graduate degree or the last 60 hours of undergraduate work if no graduate degree has been completed. If a student has successfully completed some graduate hours but not attained a graduate degree, the GPA for these courses may also be considered. An average of 3.0 (on a 4.0 scale) or above from a recognized baccalaureate, graduate, or professional degree from an accredited college or university, or an international equivalent based on a four-year curriculum is required for admission.
2. **GRE**— valid GRE scores (score date within 5 years of application) must be submitted as part of the ELPhD application.
3. **Scholarly Writing**—Students must demonstrate scholarly writing skill and mastery by submitting a reference-based paper, thesis, or other written document. The writing sample should use multiple, credible sources to support a particular point of view, argument, or claim and show the applicant's writing quality, skillful analysis/argument, and proficiency with synthesizing information. The applicant must be the sole author. The scholarly writing sample does not have a specific topic requirement.
4. **Statement of Intent**—One (1) to two (2) pages that address the following: intended enrollment (semester and year), intended concentration, autobiographical statement, educational and professional goals, and area of interest for future research. Applicants to the ABA concentration must indicate the track in which they wish to enroll: School-Aged & Adult Populations (ABAS) or Young Children & Families (YCF).
5. **Three Letters of Recommendation**—Recommendation letters should be from individuals, preferably professors, who are able to comment on the student's qualifications and scholarly aptitude for doctoral study. The letter should also address characteristics that will contribute to the student's success as a doctoral student should you be accepted in the ELPhD program. Consideration will be made based upon the content of these letters. Please make certain the recommenders know they must submit a letter as well as evaluate the applicant on a series of qualities (done when submitting the letter). Applications without three letters may not receive full consideration.
6. **Professional Curriculum Vitae (CV)/Resume**
7. **Interviews** - Applicants who pass the initial evaluation will be required to have an interview with the ELPhD program faculty and director of graduate programs.

8. **International Students** must also meet the English Language Requirement by providing TOEFL test scores: a minimum of 80 on the TOEFL iBT is required. If you have taken another TOEFL version and the results are still valid (no more than 5 years old), the score requirements are: 213 on TOEFL CBT or 550 on TOEFL PBT.

Applicants who have citizenship in a country where English is a primary language or have been awarded a degree from a university in one of the following countries are exempt from the English Language

requirement: *Australia, Belize, the British Caribbean and British West Indies, Canada (except Quebec), England, Guyana, Ireland, Liberia, New Zealand, Scotland, the United States, and Wales.*

If a candidate does not have access to a TOEFL testing site, it may be possible to accept another language proficiency test score. Candidates should inquire before submitting a test score other than the TOEFL.

*Please note the STEM Education concentration requires the following additional admission requirements:

- Three years of STEM teaching/outreach (P-16)
- Master's Degree and
- One of the following:
 - A minimum of 18 semester hours of graduate credit in a STEM discipline;
 - Teacher Licensure in a STEM discipline (Grades 6-8, 6-12, or 7-12);
 - Teacher Licensure (K-5) with 24 semester hours in math/science; or
 - Teacher Licensure (K-5) with a passing score on the state-approved licensure exam for a STEM content area.

Program Requirements

The student must maintain a cumulative point average of 3.25 and, in addition to adhering to the general regulations of the College of Graduate Studies, adhere to the specific regulations for the Ph.D. in Exceptional Learning program. These regulations, standards, and expectations include:

1. A minimum of 78–79 semester hours of successfully completed course work: 13 hours core courses, 21 hours research courses, 23–24 hours concentration courses, 6 hours elective courses, and a minimum of 15 dissertation hours. All hours should be taken at the 6000– and 7000–levels (transfer credit may include other level courses with approval). **Note:** if an equivalent specialty course is not available at the 6000– or 7000–level, a 5000–level course that is germane to the student's research/areas of research interest may be used to meet the minimum requirements of course work **only** by permission of the instructor of the course in question, student's advisor or graduate advisory committee, and the Director of Graduate Programs. Written approval must be secured before enrolling; this may be through inclusion on the approved Program of Study or separate documentation, such as a Substitution form.
 - a. A minimum of 51 semester hours of course work beyond the baccalaureate must be completed after admittance into the doctoral program, including a minimum of 12 semester hours at the 7000-level (excluding dissertation credit).
 - b. Upon approval from the student's advisory committee and the Director of Graduate Programs, up to nine (9) graduate credit hours with a grade of *B* or better can be counted toward the first 33 hours of the ELPhD Program of Study; these may be credits that are independent of or included in a previously earned degree. Requests to transfer more than a total of 18 credit hours must be approved by the Director of Graduate Programs prior to submitting the Program of Study or transfer request. No more than 27 semester hours of credit at the Master's and Educational Specialist levels, excluding theses and problems courses, may be accepted for transfer credit toward the doctorate. All transfer credit must align with Tennessee Tech and SACSCOC guidelines.
2. All requirements, including the dissertation, must be completed within a period of no more than eight (8) consecutive years.

3. As and Bs are required in coursework. A grade of C is considered a failing grade in doctoral programs. The student is allowed to maintain a grade of C in only one (1) course completed toward the Ph.D. degree. A student receiving two (2) Cs will be dismissed from the program. If a second C is received, it may not be substituted or moved out of the student's program of study in order to avoid dismissal.
4. Ds and Fs are not acceptable in the Ph.D. in Exceptional Learning program. If a student receives a grade of D or F in a course, she/he will be dismissed from the program.
5. If an *Incomplete* is granted, the student has one (1) academic year to complete the requirements. If the requirements have not been met in the allotted time period, the grade is converted to an *IF* and the student will be dismissed from the program.
6. A maximum of twelve (12) credit hours may be taken in one (1) semester. Written approval from the student's advisor/chair, department chair, and director of graduate programs is required to register and take more than 12 credit hours in one semester.
7. Course repetition is not allowed in the ELPhD program.
8. Course substitutions are allowed upon written approval from the advisor/graduate advisory committee, department chair, and director of graduate programs.
9. Students should complete their Comprehensive Examinations either a) following completion of all course work, excluding EDU 7920 and EDU 7990, or b) during the last semester during which such course work is to be completed. Comprehensive Examinations should occur no later than the end of the semester in which the student completes EDU 7920.
10. Approval of the dissertation topic, a successful dissertation proposal presentation to the entire graduate advisory committee, and IRB approval (where appropriate) must precede any significant work on the dissertation. IRB approval must be obtained for any human subjects research project initiated by a student (or faculty member); this includes studies using secondary data.
11. Satisfactory completion of the dissertation requires an oral defense.
12. Dissertation hours (15 hours minimum) may not be completed in fewer than 2 semesters.

En-route M.A. or Ed.S Degree in Curriculum and Instruction (C&I)

A student pursuing an Exceptional Learning Ph.D. may elect to earn an en-route degree as they progress through the ELPhD program. Those students entering the program with no prior graduate degree may earn an M.A. in Curriculum & Instruction (C&I) with a Curriculum concentration, as the student successfully advances toward completion of the Ph.D. Those who enter the program with a graduate degree may elect to earn either the M.A. or an Ed.S. in Curriculum & Instruction with a Curriculum concentration.

If a student elects to forego the en-route degree, the full 79 credit hours of the program must be completed. The Ph.D. is not reduced to 46–49 hours, even if a student enters with one or more graduate degrees.

En-route M.A. in Curriculum & Instruction (with Curriculum concentration)

The en-route M.A. degree may be awarded when the student successfully completes 33 semester credit hours and must include successful completion of nine (9) credit hours of either quantitative (EDU 7420, EDU 7430, and EDU 7300) or qualitative (EDU 7010, EDU 7330, and EDU 7340) research. The M.A. will not be awarded without completion of these 9 research credit hours.

Enroute-MA in Curriculum and Instruction
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Course Requirements	Credit Hours
Research Requirement: Quantitative Track: EDU7420, EDU 7430 and EDU 7300 OR Qualitative Track: EDU 7010, EDU 7330 and EDU 7340	9 hours
Advisor Guided Electives	24 hours
TOTAL Hours for Enroute MA	33 hours

Students who have already earned a graduate degree before entering the ELPhD program or who have taken graduate courses that are relevant to the program (and for which the grade is a *B* or better) may be eligible to transfer in up to 9 credits for the M.A. portion of the ELPhD program of study. Any courses taken or transferred in at the 5000-level must be applied to the en-route M.A. portion of the program unless special exception has been secured. Courses applied to the en-route M.A. must be completed within six years of enrollment.

The en-route M.A. degree may be awarded at any point during the program, given that the student:

- meets both the C&I M.A. and Ph.D. research course requirements as listed above;
- has submitted an approved Program of Study with signatures from the student's advisory committee, the Chair of C&I, and the Director of Graduate Programs;
- has satisfied all College of Graduate Studies General Degree Requirements policies; and
- has applied for graduation in accordance with the requirements of the College of Graduate Studies.

Students must apply for graduation as required in order to earn their en-route degree—it is not automatically awarded.

Once the en-route M.A. in Curriculum & Instruction has been awarded, the remaining portion of the Program of Study must include a minimum of 45–46 semester credits of appropriate graduate-level coursework consisting of research, concentration, core, and elective credits at the 6000– and 7000–level, as approved by the student's advisory committee and the Director of Graduate Programs. A minimum of 15 semester credit hours of doctoral research and dissertation is required in no fewer than two (2) semesters.

En-route Ed.S. in Curriculum & Instruction (with Curriculum concentration)

The en-route Ed.S. degree may be awarded when the student successfully completes 30 semester credit hours and must include successful completion of nine (9) credit hours of either quantitative (EDU 7420, EDU 7430, and EDU 7300) or qualitative (EDU 7010, EDU 7330, and EDU 7340) research. The Ed.S. will not be awarded without completion of these 9 research credit hours.

Enroute-Ed.S. in Curriculum and Instruction	
Course Requirements	Credit Hours
Research Requirement: Quantitative Track: EDU7420, EDU 7430 and EDU 7300 OR Qualitative Track: EDU 7010, EDU 7330 and EDU 7340	9 hours
Advisor Guided Electives	21 hours
TOTAL Hours for Enroute	30 hours

Students who have already earned a graduate degree before entering the ELPhD program or who have taken graduate courses that are relevant to the program (and for which the grade is a *B* or better) may be eligible to transfer in up to 9 credits for the en-route Ed.S. portion of the ELPhD program of study. Any courses taken or transferred in at the 5000-level must be applied to the en-route Ed.S. portion of the program unless special exception has been secured. Courses applied to the en-route Ed.S. must be completed within six years of enrollment.

The en-route Ed.S. degree may be awarded at any point during the program, given that the student:

- meets both the C&I Ed.S. and Ph.D. research course requirements as listed above;
- has submitted an approved Program of Study with signatures from the student's advisory committee, the Chair of C&I, and the Director of Graduate Programs;
- has satisfied all College of Graduate Studies General Degree Requirements policies; and
- has applied for graduation in accordance with the requirements of the College of Graduate Studies.

Students must apply for graduation as required in order to earn their en-route degree—it is not automatically awarded.

Once the en-route Ed.S. in Curriculum & Instruction has been awarded, the remaining portion of the Program of Study must include a minimum of 48–49 semester credits of appropriate graduate-level coursework consisting of research, concentration, core, and elective credits at the 6000– and 7000–level, as approved by the student's advisory committee and the Director of Graduate Programs. A minimum of 15 semester credit hours of doctoral research and dissertation is required in no fewer than two (2) semesters.

Note: Only students admitted to the ELPhD program are permitted to enroll in these courses.

Curriculum

The Exceptional Learning Ph.D. requires 78-79 credit hours and is organized into three core areas: Core Knowledge, Research Knowledge, and Concentration Knowledge. Credit hours are classified as follows:

Ph.D. Exceptional Learning Degree Requirements	
Requirement	Credit Hours
Core Coursework	13
Core Concentration Coursework	23-24
Advisor Guided Electives	6-7
Research Coursework	21
Dissertation	15+
Total Degree Requirements	78-79

Core Courses (Select 13 Credit Hours)

- EDU 7000 - Trans-Concentration Seminar Cr. 1.*
- EDU 7010 - Theoretical Foundations of Research Cr. 3.
- EDU 7020 - At-Risk Populations: Research, Service, and Delivery Cr. 3.

- EDU 7040 - Program Planning and Proposal Development Cr. 3.
- AND
- CUED 7430 - Specialized Applications of Technology to Education Cr. 3.
- OR
- EDU 7440 - Technology Applications for Institutional Dissemination of Information Cr. 3.

Research Component (Select 21 Credit Hours)

- EDU 7300 - Research Design Cr. 3.
- EDU 7330 - Qualitative Inquiry in Research Cr. 3.
- EDU 7340 - Data Analysis and Representation in Qualitative Inquiry Cr. 3.
- EDU 7420 - Quantitative Inquiry in Education I Cr. 3.
- EDU 7430 - Quantitative Inquiry in Education II Cr. 3.
- EDU 7920 - Research Seminar in Education Cr. 3. *
- Choose one additional research course from the following:
- EDU 7320 - Research Methods in Behavior Analysis Cr. 3.
- OR
- EDU 7350 - Advanced Regression Analysis Cr. 3.
- EDUP 7410 - Advanced Program Planning and Evaluation Methods I Cr. 3. *
- *EDUP 7410 counts as research for non-PPE concentration students
- CUED 7803 - Lab and Field Experiences in Education/Autoethnography Focus Cr. 3.
- EDU 7950 - Doctoral Seminar: Special Topics in Education Cr. 1-6. *
- * (only if a research-based topic)

Dissertation (15 Credit Hours)

- EDU 7990 - Research and Dissertation Cr. 1, 3, 6, 9. *
- The 15 hours are generally taken in 9 & 6 hour blocks.

Concentration Course Requirements

Applied Behavior Analysis Concentration

ABA Specialization:

School-Aged Children and Adult Populations (Select 23/24 Credit Hours)

- ABAP 7120 - Positive Behavior Support & Families Cr. 3.
- EDU 7320 - Research Methods in Behavior Analysis Cr. 3.
- EDUB 7000 - Conceptual Topics and Principles in Behavior Analysis Credit 3.
- EDUB 7010 - Topics in Behavior Analysis Cr. 3.
- EDUB 7020 - Behavior Change Procedures and Systems Supports in ABA Credit 3.
- EDUB 7030 - Assessment in Behavior Analysis Cr. 3.
- EDUB 7050 - ABA Approaches in Developmental Disabilities Cr. 3.
- EDUB 7060 - Ethics in ABA Cr. 3.

Young Children and Families (Select 23/24 Credit Hours)

- ABAP 7120 - Positive Behavior Support & Families Cr. 3.
- ABAP 7920 - Topics, Issues & Research in Early Childhood Special Education Cr. 2.
- ECED 7220 - Early Childhood Instruction and Materials Cr. 3.
- EDUC 7400 - Programs and Service Delivery Models Cr. 3.
- EDUC 7450 - Doctoral Seminar: Young Children and Families Cr. 3.
- HEC 6610 - Families: Crisis Management and Intervention for Families Cr. 3.
- SPED 6120 - Early Childhood Special Education Assessment Cr. 3.
- SPED 7110 - Family Collaboration in Special Education Cr. 3.

Health Behaviors and Wellness Education Concentration

The Health Behavior and Wellness Education (HBWE) concentration offers cutting-edge, hands-on experiential courses along with related pedagogical methods and theory. HBWE research courses supply additional opportunities to research and address discipline-specific concerns. This comprehensive and novel design supplies students with the knowledge, skills, and abilities necessary to succeed professionally and lead change in health sciences and wellness disciplines.

- EDUH 7000 - Current Issues in Exercise Science, Health Behavior, and Wellness Education Cr. 3.
- EDUH 7010 - Pedagogical Theory of Physical Education Cr. 3.
- EDUH 7020 - Advanced Teaching in Exercise Science and Health Related Fields Cr. 3.
- EDUH 7100 - Biomechanics of Human Movement Cr. 3.
- EDUH 7200 - Foundations of Health Promotion Cr. 3.
- EDUH 7300 - Behavioral Aspects of Physical Activity Cr. 3.
- EDUH 7500 - Health Behavior and Wellness Education Research Cr. 3.
- EDUH 7600 - Special Topics in Exercise Science Cr. 1-3.
- EDUH 7610 - Independent Study in Exercise Science/ Health Behavior and Wellness Education Cr. 1-3.

Literacy Concentration (Select 23/24 Credit Hours)

The Literacy concentration engages students in a continuum of exploration to develop well-rounded knowledge of literacy research, theory, and practice, as well as expand expertise in the student's choice of topic.

- EDUL 7100 - Literacy History, Theory, and Policy Cr. 3.
- EDUL 7200 - Equity Literacy Cr. 3.
- EDUL 7300 - Multiliteracies Cr. 3.
- EDUL 7400 - Literacies of Culturally & Linguistically Diverse Populations Cr. 3.
- EDUL 7500 - Linguistic Perceptions Cr. 3.
- EDUL 7600 - The Literacy Professional Cr. 3.
- EDUL 7700 - Theory, Methodology, & Trends in Literacy Research Cr. 3.
- EDUL 7900 - Community Literacy Cr. 3.

Program Planning and Evaluation Concentration (Select 23/24 Credit Hours)

This concentration prepares professionals for leadership roles in program planning and evaluation in various settings. In addition to exposing students to different theories of evaluation, the program equips students with both qualitative and quantitative research/evaluation methods.

- EDUP 7410 - Advanced Program Planning and Evaluation Methods I Cr. 3.
- EDUP 7420 - Advanced Program Planning and Evaluation Methods II Cr. 3.

- EDUP 7810 - Supervised Practicum in Program Planning and Evaluation Cr. 3-9.
18 credit hours of EDUP 7810 is required, and may be taken in blocks of 3, 6, and/or 9 credit hours.

STEM Education Concentration (Select 23/24 Credit Hours)

The STEM education concentration provides students with the background and experience needed to assume leadership roles in the development, delivery, and assessment of STEM education programs.

- EDUS 7500 - STEM Education Foundations Cr. 3.
- EDUS 7510 - STEM Curriculum & Assessment Cr. 3.
- EDUS 7540 - STEM Education Pedagogy Cr. 3.
- EDUS 7550 - STEM Education Trends and Issues Cr. 3.
- EDUS 7530 - STEM Education Research Cr. 3.
- EDUS 7560 - STEM Learners and Learning Cr. 3.
- EDUS 7580 - STEM Education Field Study Cr. 2.
- EDUS 7570 - STEM Education Policy & Leadership Cr. 3.
- EDUS 7515 - STEM Education Seminar Cr. 1.
- EDUS 7520 - STEM Technology Seminar Cr. 1.

Advisor Guided Electives

- CUED 6010 - Curriculum Development and Evaluation Cr. 3.
- CUED 7010 - Learning Theories Cr. 3.
- CUED 7030 - Rural Schools and Communities Cr. 3.
- CUED 7803 - Lab and Field Experiences in Education/Autoethnography Focus Cr. 3.
- EDU 7060 - Issues in Education Cr. 3.
- EDU 7950 - Doctoral Seminar: Special Topics in Education Cr. 1-6.
- EDUL 7200 - Equity Literacy Cr. 3.
- EDUL 7300 - Multiliteracies Cr. 3.
- EDUL 7400 - Literacies of Culturally & Linguistically Diverse Populations Cr. 3.
- EDUL 7500 - Linguistic Perceptions Cr. 3.
- EDUP 7410 - Advanced Program Planning and Evaluation Methods I Cr. 3.
- ENGL 4511 (5511) - Introduction to Descriptive Linguistics Cr. 3.
- ENGL 4561 (5561) - American English Cr. 3.
- ENGL 6010 - Teaching Composition Cr. 3.
- FOED 6020 - Perspectives in American Education Cr. 3.
- FOED 7020 - Philosophy and Public Policy Cr. 3.
- SPED 6120 - Early Childhood Special Education Assessment Cr. 3.
- SPED 7110 - Family Collaboration in Special Education Cr. 3.

Approved Substitutions for CUED 7430 or EDU 7440

The following are approved substitutions for CUED 7430 or EDU 7440. Course selections below from the Literacy concentration may only be counted as a substitution core course for those student whom are NOT in the Literacy concentration.

- CUED 7010 - Learning Theories Cr. 3.
- CUED 7510 - Instructional Design Foundations Cr. 3.

- EDU 7060 - Issues in Education Cr. 3.
- EDU 7950 - Doctoral Seminar: Special Topics in Education Cr. 1-6.
- EDUL 7200 - Equity Literacy Cr. 3.
- EDUL 7300 - Multiliteracies Cr. 3.
- EDUL 7400 - Literacies of Culturally & Linguistically Diverse Populations Cr. 3.
- EDUL 7500 - Linguistic Perceptions Cr. 3.
- FOED 6020 - Perspectives in American Education Cr. 3.
- FOED 7020 - Philosophy and Public Policy Cr. 3.

Course Substitutions

Course Substitutions are allowed upon approval of the graduate advisory committee, department chair/director, and dean of the college.

Exceptional Learning, Applied Behavior Analysis Concentration, Ph.D.

Exceptional Learning Program Information

Degree Requirements

The Exceptional Learning Ph.D. requires 78-79 credit hours and is organized into three core areas: Core Knowledge, Research Knowledge, and Concentration Knowledge. Credit hours are classified as follows:

- **Core Coursework:** 13 hours
- **Research Coursework:** 21 hours
- **Dissertation:** 15+ hours
- **Core Concentration Coursework:** 23-24 hours
- **Advisor Guided Electives:** 6-7 hours
- **Total Degree Requirements:** 78-79 hours

Core Coursework (Select 13 hours)

- EDU 7000 - Trans-Concentration Seminar Cr. 1.*
- EDU 7010 - Theoretical Foundations of Research Cr. 3.
- EDU 7020 - At-Risk Populations: Research, Service, and Delivery Cr. 3.
- EDU 7040 - Program Planning and Proposal Development Cr. 3.
- AND
- CUED 7430 - Specialized Applications of Technology to Education Cr. 3.
- OR
- EDU 7440 - Technology Applications for Institutional Dissemination of Information Cr. 3.

Research Coursework (Select 21 hours)

- EDU 7300 - Research Design Cr. 3.
- EDU 7330 - Qualitative Inquiry in Research Cr. 3.
- EDU 7340 - Data Analysis and Representation in Qualitative Inquiry Cr. 3.

- EDU 7420 - Quantitative Inquiry in Education I Cr. 3.
- EDU 7430 - Quantitative Inquiry in Education II Cr. 3.
- EDU 7920 - Research Seminar in Education Cr. 3. *

Choose one additional research course from the following:

- EDU 7320 - Research Methods in Behavior Analysis Cr. 3.
- EDU 7350 - Advanced Regression Analysis Cr. 3.
- EDUP 7410 - Advanced Program Planning and Evaluation Methods I Cr. 3. **
- CUED 7803 - Lab and Field Experiences in Education/Autoethnography Focus Cr. 3.
- EDU 7950 - Doctoral Seminar: Special Topics in Education Cr. 1-6. *

Note:

* only if a research-based topic

** EDUP 7410 counts as research for non-PPE concentration students

Dissertation (15 hours)

The 15 hours are generally taken in 9 & 6 hour blocks.

- EDU 7990 - Research and Dissertation Cr. 1, 3, 6, 9.

Core Concentration Coursework

School-Aged Children and Adult Populations (Select 23/24 hours)

- ABAP 7120 - Positive Behavior Support & Families Cr. 3.
- EDU 7320 - Research Methods in Behavior Analysis Cr. 3.
- EDUB 7000 - Conceptual Topics and Principles in Behavior Analysis Credit 3.
- EDUB 7010 - Topics in Behavior Analysis Cr. 3.
- EDUB 7020 - Behavior Change Procedures and Systems Supports in ABA Credit 3.
- EDUB 7030 - Assessment in Behavior Analysis Cr. 3.
- EDUB 7050 - ABA Approaches in Developmental Disabilities Cr. 3.
- EDUB 7060 - Ethics in ABA Cr. 3.

Young Children and Families (Select 23/24 hours)

- ABAP 7120 - Positive Behavior Support & Families Cr. 3.
- ABAP 7920 - Topics, Issues & Research in Early Childhood Special Education Cr. 2.
- ECED 7220 - Early Childhood Instruction and Materials Cr. 3.
- EDUC 7400 - Programs and Service Delivery Models Cr. 3.
- EDUC 7450 - Doctoral Seminar: Young Children and Families Cr. 3.
- HEC 6610 - Families: Crisis Management and Intervention for Families Cr. 3.
- SPED 6120 - Early Childhood Special Education Assessment Cr. 3.

- SPED 7110 - Family Collaboration in Special Education Cr. 3.

Advisor Guided Electives

- CUED 6010 - Curriculum Development and Evaluation Cr. 3.
- CUED 7010 - Learning Theories Cr. 3.
- CUED 7030 - Rural Schools and Communities Cr. 3.
- CUED 7803 - Lab and Field Experiences in Education/Autoethnography Focus Cr. 3.
- EDU 7060 - Issues in Education Cr. 3.
- EDU 7950 - Doctoral Seminar: Special Topics in Education Cr. 1-6.
- EDUL 7200 - Equity Literacy Cr. 3.
- EDUL 7300 - Multiliteracies Cr. 3.
- EDUL 7400 - Literacies of Culturally & Linguistically Diverse Populations Cr. 3.
- EDUL 7500 - Linguistic Perceptions Cr. 3.
- EDUP 7410 - Advanced Program Planning and Evaluation Methods I Cr. 3.
- ENGL 4511 (5511) - Introduction to Descriptive Linguistics Cr. 3.
- ENGL 4561 (5561) - American English Cr. 3.
- ENGL 6010 - Teaching Composition Cr. 3.
- FOED 6020 - Perspectives in American Education Cr. 3.
- FOED 7020 - Philosophy and Public Policy Cr. 3.
- SPED 6120 - Early Childhood Special Education Assessment Cr. 3.
- SPED 7110 - Family Collaboration in Special Education Cr. 3.

Course Substitutions

Course Substitutions are allowed upon approval of the graduate advisory committee, department chair/director, and dean of the college.

Exceptional Learning, Health Behaviors and Wellness Education Concentration, Ph.D.

Exceptional Learning Program Information

Degree Requirements

The Exceptional Learning Ph.D. requires 78-79 credit hours and is organized into three core areas: Core Knowledge, Research Knowledge, and Concentration Knowledge. Credit hours are classified as follows:

- **Core Coursework:** 13 hours
- **Research Coursework:** 21 hours
- **Dissertation:** 15+ hours
- **Core Concentration Coursework:** 23-24 hours
- **Advisor Guided Electives:** 6-7 hours
- **Total Degree Requirements:** 78-79 hours

Core Coursework (Select 13 hours)

- EDU 7000 - Trans-Concentration Seminar Cr. 1.*
- EDU 7010 - Theoretical Foundations of Research Cr. 3.
- EDU 7020 - At-Risk Populations: Research, Service, and Delivery Cr. 3.
- EDU 7040 - Program Planning and Proposal Development Cr. 3.
- AND
- CUED 7430 - Specialized Applications of Technology to Education Cr. 3.
- OR
- EDU 7440 - Technology Applications for Institutional Dissemination of Information Cr. 3.

Research Coursework (Select 21 hours)

- EDU 7300 - Research Design Cr. 3.
- EDU 7330 - Qualitative Inquiry in Research Cr. 3.
- EDU 7340 - Data Analysis and Representation in Qualitative Inquiry Cr. 3.
- EDU 7420 - Quantitative Inquiry in Education I Cr. 3.
- EDU 7430 - Quantitative Inquiry in Education II Cr. 3.
- EDU 7920 - Research Seminar in Education Cr. 3. *

Choose one additional research course from the following:

- EDU 7320 - Research Methods in Behavior Analysis Cr. 3.
- EDU 7350 - Advanced Regression Analysis Cr. 3.
- EDUP 7410 - Advanced Program Planning and Evaluation Methods I Cr. 3. **
- CUED 7803 - Lab and Field Experiences in Education/Autoethnography Focus Cr. 3.
- EDU 7950 - Doctoral Seminar: Special Topics in Education Cr. 1-6. *

Note:

* only if a research-based topic

** EDUP 7410 counts as research for non-PPE concentration students

Dissertation (15 hours)

The 15 hours are generally taken in 9 & 6 hour blocks.

- EDU 7990 - Research and Dissertation Cr. 1, 3, 6, 9.

Core Concentration Coursework

The Health Behavior and Wellness Education (HBWE) concentration offers cutting-edge, hands-on experiential courses along with related pedagogical methods and theory. HBWE research courses supply additional opportunities to research and address discipline-specific concerns. This comprehensive and novel design supplies students with the knowledge, skills, and abilities necessary to succeed professionally and lead change in health sciences and wellness disciplines. HBWE students will select 24 credit hours from the following courses:

- EDUH 7000 - Current Issues in Exercise Science, Health Behavior, and Wellness Education Cr. 3.
- EDUH 7010 - Pedagogical Theory of Physical Education Cr. 3.

- EDUH 7020 - Advanced Teaching in Exercise Science and Health Related Fields Cr. 3.
- EDUH 7100 - Biomechanics of Human Movement Cr. 3.
- EDUH 7200 - Foundations of Health Promotion Cr. 3.
- EDUH 7300 - Behavioral Aspects of Physical Activity Cr. 3.
- EDUH 7500 - Health Behavior and Wellness Education Research Cr. 3.
- EDUH 7520 - Inquiry in Health Behavior and Wellness Education Cr. 1-4.
- EDUH 7600 - Special Topics in Exercise Science Cr. 1-3.
- EDUH 7610 - Independent Study in Exercise Science/ Health Behavior and Wellness Education Cr. 1-3.

Advisor Guided Electives

- CUED 6010 - Curriculum Development and Evaluation Cr. 3.
- CUED 7010 - Learning Theories Cr. 3.
- CUED 7030 - Rural Schools and Communities Cr. 3.
- CUED 7803 - Lab and Field Experiences in Education/Autoethnography Focus Cr. 3.
- EDU 7060 - Issues in Education Cr. 3.
- EDU 7950 - Doctoral Seminar: Special Topics in Education Cr. 1-6.
- EDUL 7200 - Equity Literacy Cr. 3.
- EDUL 7300 - Multiliteracies Cr. 3.
- EDUL 7400 - Literacies of Culturally & Linguistically Diverse Populations Cr. 3.
- EDUL 7500 - Linguistic Perceptions Cr. 3.
- EDUP 7410 - Advanced Program Planning and Evaluation Methods I Cr. 3.
- ENGL 4511 (5511) - Introduction to Descriptive Linguistics Cr. 3.
- ENGL 4561 (5561) - American English Cr. 3.
- ENGL 6010 - Teaching Composition Cr. 3.
- FOED 6020 - Perspectives in American Education Cr. 3.
- FOED 7020 - Philosophy and Public Policy Cr. 3.
- SPED 6120 - Early Childhood Special Education Assessment Cr. 3.
- SPED 7110 - Family Collaboration in Special Education Cr. 3.

Course Substitutions

Course Substitutions are allowed upon approval of the graduate advisory committee, department chair/director, and dean of the college.

Exceptional Learning, Literacy Concentration, Ph.D.

Exceptional Learning Program Information

Degree Requirements

The Exceptional Learning Ph.D. requires 78-79 credit hours and is organized into three core areas: Core Knowledge, Research Knowledge, and Concentration Knowledge. Credit hours are classified as follows:

- **Core Coursework:** 13 hours
- **Research Coursework:** 21 hours
- **Dissertation:** 15+ hours
- **Core Concentration Coursework:** 23-24 hours

- **Advisor Guided Electives:** 6-7 hours
- **Total Degree Requirements:** 78-79 hours

Core Coursework (Select 13 hours)

- EDU 7000 - Trans-Concentration Seminar Cr. 1.*
- EDU 7010 - Theoretical Foundations of Research Cr. 3.
- EDU 7020 - At-Risk Populations: Research, Service, and Delivery Cr. 3.
- EDU 7040 - Program Planning and Proposal Development Cr. 3.
- AND
- CUED 7430 - Specialized Applications of Technology to Education Cr. 3.
- OR
- EDU 7440 - Technology Applications for Institutional Dissemination of Information Cr. 3.

Research Coursework (Select 21 hours)

- EDU 7300 - Research Design Cr. 3.
- EDU 7330 - Qualitative Inquiry in Research Cr. 3.
- EDU 7340 - Data Analysis and Representation in Qualitative Inquiry Cr. 3.
- EDU 7420 - Quantitative Inquiry in Education I Cr. 3.
- EDU 7430 - Quantitative Inquiry in Education II Cr. 3.
- EDU 7920 - Research Seminar in Education Cr. 3. *

Choose one additional research course from the following:

- EDU 7320 - Research Methods in Behavior Analysis Cr. 3.
- EDU 7350 - Advanced Regression Analysis Cr. 3.
- EDUP 7410 - Advanced Program Planning and Evaluation Methods I Cr. 3. **
- CUED 7803 - Lab and Field Experiences in Education/Autoethnography Focus Cr. 3.
- EDU 7950 - Doctoral Seminar: Special Topics in Education Cr. 1-6. *

Note:

* only if a research-based topic

** EDUP 7410 counts as research for non-PPE concentration students

Dissertation (15 hours)

The 15 hours are generally taken in 9 & 6 hour blocks.

- EDU 7990 - Research and Dissertation Cr. 1, 3, 6, 9.

Core Concentration Coursework

The Literacy concentration engages students in a continuum of exploration to develop well-rounded knowledge of literacy research, theory, and practice, as well as expand expertise in the student's choice of topic.

- EDUL 7100 - Literacy History, Theory, and Policy Cr. 3.
- EDUL 7200 - Equity Literacy Cr. 3.
- EDUL 7300 - Multiliteracies Cr. 3.
- EDUL 7400 - Literacies of Culturally & Linguistically Diverse Populations Cr. 3.
- EDUL 7500 - Linguistic Perceptions Cr. 3.
- EDUL 7600 - The Literacy Professional Cr. 3.
- EDUL 7700 - Theory, Methodology, & Trends in Literacy Research Cr. 3.
- EDUL 7900 - Community Literacy Cr. 3.

Advisor Guided Electives

- CUED 6010 - Curriculum Development and Evaluation Cr. 3.
- CUED 7010 - Learning Theories Cr. 3.
- CUED 7030 - Rural Schools and Communities Cr. 3.
- CUED 7803 - Lab and Field Experiences in Education/Autoethnography Focus Cr. 3.
- EDU 7060 - Issues in Education Cr. 3.
- EDU 7950 - Doctoral Seminar: Special Topics in Education Cr. 1-6.
- EDUL 7200 - Equity Literacy Cr. 3.
- EDUL 7300 - Multiliteracies Cr. 3.
- EDUL 7400 - Literacies of Culturally & Linguistically Diverse Populations Cr. 3.
- EDUL 7500 - Linguistic Perceptions Cr. 3.
- EDUP 7410 - Advanced Program Planning and Evaluation Methods I Cr. 3.
- ENGL 4511 (5511) - Introduction to Descriptive Linguistics Cr. 3.
- ENGL 4561 (5561) - American English Cr. 3.
- ENGL 6010 - Teaching Composition Cr. 3.
- FOED 6020 - Perspectives in American Education Cr. 3.
- FOED 7020 - Philosophy and Public Policy Cr. 3.
- SPED 6120 - Early Childhood Special Education Assessment Cr. 3.
- SPED 7110 - Family Collaboration in Special Education Cr. 3.

Course Substitutions

Course Substitutions are allowed upon approval of the graduate advisory committee, department chair/director, and dean of the college.

Exceptional Learning, Program Planning and Evaluation Concentration, Ph.D.

Exceptional Learning Program Information

Degree Requirements

The Exceptional Learning Ph.D. requires 78-79 credit hours and is organized into three core areas: Core Knowledge, Research Knowledge, and Concentration Knowledge. Credit hours are classified as follows:

- **Core Coursework:** 13 hours
- **Research Coursework:** 21 hours

- **Dissertation:** 15+ hours
- **Core Concentration Coursework:** 23-24 hours
- **Advisor Guided Electives:** 6-7 hours
- **Total Degree Requirements:** 78-79 hours

Core Coursework (Select 13 hours)

- EDU 7000 - Trans-Concentration Seminar Cr. 1.*
- EDU 7010 - Theoretical Foundations of Research Cr. 3.
- EDU 7020 - At-Risk Populations: Research, Service, and Delivery Cr. 3.
- EDU 7040 - Program Planning and Proposal Development Cr. 3.
- AND
- CUED 7430 - Specialized Applications of Technology to Education Cr. 3.
- OR
- EDU 7440 - Technology Applications for Institutional Dissemination of Information Cr. 3.

Research Coursework (Select 21 hours)

- EDU 7300 - Research Design Cr. 3.
- EDU 7330 - Qualitative Inquiry in Research Cr. 3.
- EDU 7340 - Data Analysis and Representation in Qualitative Inquiry Cr. 3.
- EDU 7420 - Quantitative Inquiry in Education I Cr. 3.
- EDU 7430 - Quantitative Inquiry in Education II Cr. 3.
- EDU 7920 - Research Seminar in Education Cr. 3. *

Choose one additional research course from the following:

- EDU 7320 - Research Methods in Behavior Analysis Cr. 3.
- EDU 7350 - Advanced Regression Analysis Cr. 3.
- EDUP 7410 - Advanced Program Planning and Evaluation Methods I Cr. 3. **
- CUED 7803 - Lab and Field Experiences in Education/Autoethnography Focus Cr. 3.
- EDU 7950 - Doctoral Seminar: Special Topics in Education Cr. 1-6. *

Note:

* Only if a research-based topic

** EDUP 7410 counts as research for non-PPE concentration students

Dissertation (15 hours)

The 15 hours are generally taken in 9 & 6 hour blocks.

- EDU 7990 - Research and Dissertation Cr. 1, 3, 6, 9.

Core Concentration Coursework

This concentration prepares professionals for leadership roles in program planning and evaluation in various settings. In addition to exposing students to different theories of evaluation, the program equips students with both qualitative and quantitative research/evaluation methods.

- EDUP 7410 - Advanced Program Planning and Evaluation Methods I Cr. 3.
- EDUP 7420 - Advanced Program Planning and Evaluation Methods II Cr. 3.
- EDUP 7810 - Supervised Practicum in Program Planning and Evaluation Cr. 3-9.
18 credit hours of EDUP 7810 is required, and may be taken in blocks of 3, 6, and/or 9 credit hours.

Advisor Guided Electives

- CUED 6010 - Curriculum Development and Evaluation Cr. 3.
- CUED 7010 - Learning Theories Cr. 3.
- CUED 7030 - Rural Schools and Communities Cr. 3.
- CUED 7803 - Lab and Field Experiences in Education/Autoethnography Focus Cr. 3.
- EDU 7060 - Issues in Education Cr. 3.
- EDU 7950 - Doctoral Seminar: Special Topics in Education Cr. 1-6.
- EDUL 7200 - Equity Literacy Cr. 3.
- EDUL 7300 - Multiliteracies Cr. 3.
- EDUL 7400 - Literacies of Culturally & Linguistically Diverse Populations Cr. 3.
- EDUL 7500 - Linguistic Perceptions Cr. 3.
- EDUP 7410 - Advanced Program Planning and Evaluation Methods I Cr. 3.
- ENGL 4511 (5511) - Introduction to Descriptive Linguistics Cr. 3.
- ENGL 4561 (5561) - American English Cr. 3.
- ENGL 6010 - Teaching Composition Cr. 3.
- FOED 6020 - Perspectives in American Education Cr. 3.
- FOED 7020 - Philosophy and Public Policy Cr. 3.
- SPED 6120 - Early Childhood Special Education Assessment Cr. 3.
- SPED 7110 - Family Collaboration in Special Education Cr. 3.

Course Substitutions

Course Substitutions are allowed upon approval of the graduate advisory committee, department chair/director, and dean of the college.

Exceptional Learning, STEM Education Concentration, Ph.D.

Exceptional Learning Program Information

Degree Requirements

The Exceptional Learning Ph.D. requires 78-79 credit hours and is organized into three core areas: Core Knowledge, Research Knowledge, and Concentration Knowledge. Credit hours are classified as follows:

- **Core Coursework:** 13 hours
- **Research Coursework:** 21 hours
- **Dissertation:** 15+ hours
- **Core Concentration Coursework:** 23-24 hours
- **Advisor Guided Electives:** 6-7 hours

- **Total Degree Requirements:** 78-79 hours

Core Coursework (Select 13 hours)

- EDU 7000 - Trans-Concentration Seminar Cr. 1.*
- EDU 7010 - Theoretical Foundations of Research Cr. 3.
- EDU 7020 - At-Risk Populations: Research, Service, and Delivery Cr. 3.
- EDU 7040 - Program Planning and Proposal Development Cr. 3.
- AND
- CUED 7430 - Specialized Applications of Technology to Education Cr. 3.
- OR
- EDU 7440 - Technology Applications for Institutional Dissemination of Information Cr. 3.

Research Coursework (Select 21 hours)

- EDU 7300 - Research Design Cr. 3.
- EDU 7330 - Qualitative Inquiry in Research Cr. 3.
- EDU 7340 - Data Analysis and Representation in Qualitative Inquiry Cr. 3.
- EDU 7420 - Quantitative Inquiry in Education I Cr. 3.
- EDU 7430 - Quantitative Inquiry in Education II Cr. 3.
- EDU 7920 - Research Seminar in Education Cr. 3. *

Choose one additional research course from the following:

- EDU 7320 - Research Methods in Behavior Analysis Cr. 3.
- EDU 7350 - Advanced Regression Analysis Cr. 3.
- EDUP 7410 - Advanced Program Planning and Evaluation Methods I Cr. 3. **
- CUED 7803 - Lab and Field Experiences in Education/Autoethnography Focus Cr. 3.
- EDU 7950 - Doctoral Seminar: Special Topics in Education Cr. 1-6. *

Note:

* only if a research-based topic

** EDUP 7410 counts as research for non-PPE concentration students

Dissertation (15 hours)

The 15 hours are generally taken in 9 & 6 hour blocks.

- EDU 7990 - Research and Dissertation Cr. 1, 3, 6, 9.

STEM Education Concentration

The STEM education concentration provides students with the background and experience needed to assume leadership roles in the development, delivery, and assessment of STEM education programs.

- EDUS 7500 - STEM Education Foundations Cr. 3.
- EDUS 7510 - STEM Curriculum & Assessment Cr. 3.
- EDUS 7540 - STEM Education Pedagogy Cr. 3.
- EDUS 7550 - STEM Education Trends and Issues Cr. 3.
- EDUS 7530 - STEM Education Research Cr. 3.
- EDUS 7560 - STEM Learners and Learning Cr. 3.
- EDUS 7580 - STEM Education Field Study Cr. 2.
- EDUS 7570 - STEM Education Policy & Leadership Cr. 3.
- EDUS 7515 - STEM Education Seminar Cr. 1.
- EDUS 7520 - STEM Technology Seminar Cr. 1.

Course Substitutions

Course Substitutions are allowed upon approval of the graduate advisory committee, department chair/director, and dean of the college.

Master of Arts

Degree Programs

<https://www.tntech.edu/education/ci/graduate.php>

Master of Arts Degree Admission Requirements

Students pursuing graduate study in the Department of Curriculum and Instruction have the option of three (3) types of programs leading to the Master of Arts degree: 1) licensure; 2) non-licensure; and 3) post-baccalaureate.

Requirements for Admission in Full Standing (Licensure, Non-licensure, and post-baccalaureate programs):

- For full admission, overall undergraduate GPA of 2.75 or above upon completion of a baccalaureate degree program.
- Provide contact information for three references (name and email)
- Successfully complete additional College of Graduate Studies application requirements (transcripts, application, etc.)

Additional Admission Requirements for Provisional Standing (Licensure, Non-licensure, and Post-baccalaureate programs):

- Provisional standing may be requested by a departmental evaluation when the undergraduate GPA is lower than 2.75. Teacher licensure standards may require a separate minimum GPA for licensure.
- To advance from provisional to full admission, a student must earn a minimum of 3.0 GPA on the first nine (9) hours of graduate study.

Additional Admission Requirements for International Students (Licensure, Non-licensure, and Post-baccalaureate programs):

International applicants must also meet or exceed the minimum English Language Requirements as set by the College of Graduate Studies in the current Graduate Catalog.

Curriculum and Instruction, Applied Behavior Analysis Concentration, Ed.S.

Curriculum and Instruction, Ed.S. Program Information

Degree Requirements

- **Core Concentration Coursework***: 24 hours
- **Research Coursework**: 6 hours
- **Total Degree Requirements**: 30 hours

*If the student has completed CUED 6010 at the MA level, they will take a 3-credit hour Advisor Approved Elective as part of their 24 hour core requirement.

Core Concentration Coursework

- CUED 6010 - Curriculum Development and Evaluation Cr. 3.
*If taken at the MA level, student will select another Advisor Guided Elective.
- EDUB 6000 - Conceptual Topics and Principles in Behavior Analysis Credit 3.
- EDUB 7010 - Topics in Behavior Analysis Cr. 3.
- EDUB 7020 - Behavior Change Procedures and Systems Supports in ABA Credit 3.
- EDUB 7030 - Assessment in Behavior Analysis Cr. 3.
- EDUB 7050 - ABA Approaches in Developmental Disabilities Cr. 3.
- EDUB 7060 - Ethics in ABA Cr. 3.
- FOED 7020 - Philosophy and Public Policy Cr. 3.

Research Coursework

- CUED 7910 - Advanced Research Project in Education Cr. 3.
- EDU 7320 - Research Methods in Behavior Analysis Cr. 3.

Advisor Guided Electives

Students, at the advice of their advisor and/or committee, may take 6000, or 7000 level courses from the following subject list.

- AGED - Agricultural Education
- CTE - Career Technical Education
- CFS - Child and Family Studies
- CUED - Curriculum Education
- ECED - Early Childhood Education
- ECSP - Early Childhood Special Education
- ELED - Elementary Education
- ESLP - English as a Second Language Pedagogy
- FOED - Foundations of Education
- INSL - Instructional Leadership
- LSCI - Library Science
- READ - Reading
- SEED - Secondary Education
- SPED - Special Education
- ABAP - Applied Behavioral Analysis
- EDU - Education
- EDUB - Behavior
- EDUC - Young Children

- EDUL - Literacy
- EDUP - Program Planning & Evaluation
- EDUS - STEM Education
- CSED - Computer Science Education
- ESOL - English as a Second or Other Language
- SVCL - Service Learning
- EXPW - Exercise, Physical Education and Wellness
- HEC - Human Ecology
- MUS - Music
- MUED - Music Education
- EDUH - Health Behavior/Wellness Education

Course Substitutions

Course Substitutions are allowed upon approval of the graduate advisory committee, department chair/director, and dean of the college.

Curriculum and Instruction, Curriculum Concentration, Ed.S.

Curriculum and Instruction, Ed.S. Program Information

Degree Requirements

- **Core Concentration Coursework:** 3-6 hours
- **Practicum and Research Coursework:** 6 hours
- **Advisor Guided Electives:** 18-21 hours
- **Total Degree Requirements:** 30 hours

Core Concentration Coursework

- CUED 6010 - Curriculum Development and Evaluation Cr. 3. *
- *If CUED 6010 is taken at the MA level, student will select another Advisor Guided Elective.
- FOED 7020 - Philosophy and Public Policy Cr. 3.

Practicum and Research Coursework

- CUED 7801 - Lab and Field Experiences in Education/Technology Focus Cr. 3.
OR
- CUED 7802 - Lab and Field Experiences in Education/Grant Writing Focus Cr. 3.
OR
- CUED 7803 - Lab and Field Experiences in Education/Autoethnography Focus Cr. 3.
- CUED 7910 - Advanced Research Project in Education Cr. 3.

Advisor Guided Electives

Students, at the advice of their advisor and/or committee, may take 6000, or 7000 level courses from the following subject list.

- AGED - Agricultural Education
- CTE - Career Technical Education
- CFS - Child and Family Studies
- CUED - Curriculum Education
- ECED - Early Childhood Education
- ECSP - Early Childhood Special Education
- ELED - Elementary Education
- ESLP - English as a Second Language Pedagogy
- FOED - Foundations of Education
- INSL - Instructional Leadership
- LSCI - Library Science
- READ - Reading
- SEED - Secondary Education
- SPED - Special Education
- ABAP - Applied Behavioral Analysis
- EDU - Education
- EDUB - Behavior
- EDUC - Young Children
- EDUL - Literacy
- EDUP - Program Planning & Evaluation
- EDUS - STEM Education
- CSED - Computer Science Education
- ESOL - English as a Second or Other Language
- SVCL - Service Learning
- EXPW - Exercise, Physical Education and Wellness
- HEC - Human Ecology
- MUS - Music
- MUED - Music Education
- EDUH - Health Behavior/Wellness Education

Course Substitutions

Course Substitutions are allowed upon approval of the graduate advisory committee, department chair/director, and dean of the college.

Curriculum and Instruction, Early Childhood Education Concentration, Ed.S.

Curriculum and Instruction, Ed.S. Program Information

Degree Requirements

- **Core Concentration Coursework:** 12-15 hours
- **Practicum and Research Coursework:** 6 hours
- **Advisor Guided Electives:** 9-12 hours
- **Total Degree Requirements:** 30 hours

Core Concentration Coursework

- ABAP 7120 - Positive Behavior Support & Families Cr. 3.
- SPED 6050 - Introduction to Applied Behavior Analysis Cr. 3.
- READ 7020 - Family Literacy Cr. 3.
- CUED 6010 - Curriculum Development and Evaluation Cr. 3. *
- *If taken at the MA level, student will select another Advisor Guided Elective
- FOED 7020 - Philosophy and Public Policy Cr. 3.

Practicum and Research Coursework

- ECED 7800 - Laboratory and Field Experiences in Education Cr. 3-4.
- ECED 7910 - Independent Study in Education Cr. 3.

Advisor Guided Electives

Students, at the advice of their advisor and/or committee, may take 6000, or 7000 level courses from the following subject list.

- AGED - Agricultural Education
- CTE - Career Technical Education
- CFS - Child and Family Studies
- CUED - Curriculum Education
- ECED - Early Childhood Education
- ECSP - Early Childhood Special Education
- ELED - Elementary Education
- ESLP - English as a Second Language Pedagogy
- FOED - Foundations of Education
- INSL - Instructional Leadership
- LSCI - Library Science
- READ - Reading
- SEED - Secondary Education
- SPED - Special Education
- ABAP - Applied Behavioral Analysis
- EDU - Education
- EDUB - Behavior
- EDUC - Young Children
- EDUL - Literacy
- EDUP - Program Planning & Evaluation
- EDUS - STEM Education
- CSED - Computer Science Education
- ESOL - English as a Second or Other Language
- SVCL - Service Learning
- EXPW - Exercise, Physical Education and Wellness
- HEC - Human Ecology
- MUS - Music
- MUED - Music Education
- EDUH - Health Behavior/Wellness Education

Course Substitutions

Course Substitutions are allowed upon approval of the graduate advisory committee, department chair/director, and dean of the college.

Curriculum and Instruction, Educational Technology Concentration, Ed.S.

Curriculum and Instruction, Ed.S. Program Information

Degree Requirements

- **Core Concentration Coursework:** 12-15 hours
- **Practicum and Research Coursework:** 6 hours
- **Advisor Guided Electives:** 9-12 hours
- **Total Degree Requirements:** 30 hours

Core Concentration Coursework

- CUED 6010 - Curriculum Development and Evaluation Cr. 3. *
- *If taken at the MA level, student will have to select another Advisor Guided Elective.
- CUED 6440 - Emerging Technologies in Education Cr. 3.
- CUED 6460 - Constructivist Strategies for Classroom Instruction Cr. 3.
- CUED 7430 - Specialized Applications of Technology to Education Cr. 3.
- CUED 7530 - Designing Integrated Technology Environments Cr. 3.

Practicum and Research Coursework

- CUED 7801 - Lab and Field Experiences in Education/Technology Focus Cr. 3.
- CUED 7910 - Advanced Research Project in Education Cr. 3.

Advisor Guided Electives

Students, at the advice of their advisor and/or committee, may take 6000, or 7000 level courses from the following subject list.

- AGED - Agricultural Education
- CTE - Career Technical Education
- CFS - Child and Family Studies
- CUED - Curriculum Education
- ECED - Early Childhood Education
- ECSP - Early Childhood Special Education
- ELED - Elementary Education
- ESLP - English as a Second Language Pedagogy
- FOED - Foundations of Education
- INSL - Instructional Leadership
- LSCI - Library Science

- READ - Reading
- SEED - Secondary Education
- SPED - Special Education
- ABAP - Applied Behavioral Analysis
- EDU - Education
- EDUB - Behavior
- EDUC - Young Children
- EDUL - Literacy
- EDUP - Program Planning & Evaluation
- EDUS - STEM Education
- CSED - Computer Science Education
- ESOL - English as a Second or Other Language
- SVCL - Service Learning
- EXPW - Exercise, Physical Education and Wellness
- HEC - Human Ecology
- MUS - Music
- MUED - Music Education
- EDUH - Health Behavior/Wellness Education

Course Substitutions

Course Substitutions are allowed upon approval of the graduate advisory committee, department chair/director, and dean of the college.

Curriculum and Instruction, Elementary Education Concentration, Ed.S.

Curriculum and Instruction, Ed.S. Program Information

Degree Requirements

- **Core Concentration Coursework:** 6-9 hours
- **Practicum and Research Coursework:** 6 hours
- **Advisor Guided Electives:** 15-18 hours
- **Total Degree Requirements:** 30 hours

Core Concentration Coursework

- CUED 6010 - Curriculum Development and Evaluation Cr. 3. *
- *If taken at the MA level, student will select another Advisor Guided Elective.
- CUED 7010 - Learning Theories Cr. 3.
- FOED 7020 - Philosophy and Public Policy Cr. 3.

Practicum and Research Coursework

- CUED 7801 - Lab and Field Experiences in Education/Technology Focus Cr. 3.
- OR

- CUED 7802 - Lab and Field Experiences in Education/Grant Writing Focus Cr. 3.
OR
- CUED 7803 - Lab and Field Experiences in Education/Autoethnography Focus Cr. 3.
- CUED 7910 - Advanced Research Project in Education Cr. 3.

Advisor Guided Electives

Students, at the advice of their advisor and/or committee, may take 6000, or 7000 level courses from the following subject list.

- AGED - Agricultural Education
- CTE - Career Technical Education
- CFS - Child and Family Studies
- CUED - Curriculum Education
- ECED - Early Childhood Education
- ECSP - Early Childhood Special Education
- ELED - Elementary Education
- ESLP - English as a Second Language Pedagogy
- FOED - Foundations of Education
- INSL - Instructional Leadership
- LSCI - Library Science
- READ - Reading
- SEED - Secondary Education
- SPED - Special Education
- ABAP - Applied Behavioral Analysis
- EDU - Education
- EDUB - Behavior
- EDUC - Young Children
- EDUL - Literacy
- EDUP - Program Planning & Evaluation
- EDUS - STEM Education
- CSED - Computer Science Education
- ESOL - English as a Second or Other Language
- SVCL - Service Learning
- EXPW - Exercise, Physical Education and Wellness
- HEC - Human Ecology
- MUS - Music
- MUED - Music Education
- EDUH - Health Behavior/Wellness Education

Course Substitutions

Course Substitutions are allowed upon approval of the graduate advisory committee, department chair/director, and dean of the college.

Curriculum and Instruction, Exercise Science Concentration, Ed.S.

Curriculum and Instruction, Ed.S. Program Information

Degree Requirements

- **Core Concentration Coursework:** 18 hours
- **Practicum and Research Coursework:** 6 hours *
- **Advisor Guided Electives:** 6 hours
- **Total Degree Requirements:** 30 hours

* Student must take EXPW 6510 before CUED 7910 if no Research Methods or equivalent in Exercise Science on transcript (in place of one 3-hour elective course)

Core Concentration Coursework

- CUED 7010 - Learning Theories Cr. 3.
- FOED 7020 - Philosophy and Public Policy Cr. 3.
- EXPW 6600 - Special Topics in Exercise Science Cr. 1-3. (3 credit hours required)
- EXPW 6440 - Physiology of Exercise Cr. 3.
- EXPW 7000 - Current Issues in Exercise Science, Health Behavior, and Wellness Education Cr. 3.
- EXPW 7010 - Pedagogical Theory of Physical Education Cr. 3.

Practicum and Research Coursework

- CUED 7801 - Lab and Field Experiences in Education/Technology Focus Cr. 3.
OR
- CUED 7802 - Lab and Field Experiences in Education/Grant Writing Focus Cr. 3.
OR
- CUED 7803 - Lab and Field Experiences in Education/Autoethnography Focus Cr. 3.
- CUED 7910 - Advanced Research Project in Education Cr. 3.

Advisor Guided Electives

Students, at the advice of their advisor and/or committee, may take 6000, or 7000 level courses from the following subject list.

- AGED - Agricultural Education
- CTE - Career Technical Education
- CFS - Child and Family Studies
- CUED - Curriculum Education
- ECED - Early Childhood Education
- ECSP - Early Childhood Special Education
- ELED - Elementary Education
- ESLP - English as a Second Language Pedagogy
- FOED - Foundations of Education

- INSL - Instructional Leadership
- LSCI - Library Science
- READ - Reading
- SEED - Secondary Education
- SPED - Special Education
- ABAP - Applied Behavioral Analysis
- EDU - Education
- EDUB - Behavior
- EDUC - Young Children
- EDUL - Literacy
- EDUP - Program Planning & Evaluation
- EDUS - STEM Education
- CSED - Computer Science Education
- ESOL - English as a Second or Other Language
- SVCL - Service Learning
- EXPW - Exercise, Physical Education and Wellness
- HEC - Human Ecology
- MUS - Music
- MUED - Music Education
- EDUH - Health Behavior/Wellness Education

Course Substitutions

Course Substitutions are allowed upon approval of the graduate advisory committee, department chair/director, and dean of the college.

Curriculum and Instruction, Family and Consumer Sciences Concentration, Ed.S.

Curriculum and Instruction, Ed.S. Program Information

Degree Requirements

- **Core Concentration Coursework:** 18 hours
- **Practicum and Research Coursework:** 6 hours
- **Advisor Guided Electives:** 6 hours
- **Total Degree Requirements:** 30 hours

Core Concentration Coursework

- CUED 7010 - Learning Theories Cr. 3.
- FOED 7020 - Philosophy and Public Policy Cr. 3.
- HEC 6610 - Families: Crisis Management and Intervention for Families Cr. 3.
- HEC 6630 - Strategies and Advocacy for Families Cr. 3.
- HEC 6811 - Learning and Instructional Strategies in Family Consumer Sciences Education Cr. 3.
- PSY 7200 - Advanced Educational Psychology Cr. 3.

Practicum and Research Coursework

- CUED 7801 - Lab and Field Experiences in Education/Technology Focus Cr. 3.
OR
- CUED 7802 - Lab and Field Experiences in Education/Grant Writing Focus Cr. 3.
OR
- CUED 7803 - Lab and Field Experiences in Education/Autoethnography Focus Cr. 3.
- CUED 7910 - Advanced Research Project in Education Cr. 3.

Advisor Guided Electives

Students, at the advice of their advisor and/or committee, may take 6000, or 7000 level courses from the following subject list.

- AGED - Agricultural Education
- CTE - Career Technical Education
- CFS - Child and Family Studies
- CUED - Curriculum Education
- ECED - Early Childhood Education
- ECSP - Early Childhood Special Education
- ELED - Elementary Education
- ESLP - English as a Second Language Pedagogy
- FOED - Foundations of Education
- INSL - Instructional Leadership
- LSCI - Library Science
- READ - Reading
- SEED - Secondary Education
- SPED - Special Education
- ABAP - Applied Behavioral Analysis
- EDU - Education
- EDUB - Behavior
- EDUC - Young Children
- EDUL - Literacy
- EDUP - Program Planning & Evaluation
- EDUS - STEM Education
- CSED - Computer Science Education
- ESOL - English as a Second or Other Language
- SVCL - Service Learning
- EXPW - Exercise, Physical Education and Wellness
- HEC - Human Ecology
- MUS - Music
- MUED - Music Education
- EDUH - Health Behavior/Wellness Education

Course Substitutions

Course Substitutions are allowed upon approval of the graduate advisory committee, department chair/director, and dean of the college.

Curriculum and Instruction, Library Science Concentration, Ed.S.

Curriculum and Instruction, Ed.S. Program Information

Degree Requirements

- **Core Concentration Coursework:** 24 hours
- **Practicum and Research Courses:** 6 hours
- **Total Degree Requirements:** 30 hours

Core Concentration Coursework

- CSED 6000 - Digital Literacy and Computing Cr. 3.
OR
- CSED 6010 - Programming Fundamentals and Computational Thinking for Educators Cr. 3.
- FOED 7020 - Philosophy and Public Policy Cr. 3.
- LSCI 6010 - Classification and Cataloging of Media and Materials Cr. 3.
- LSCI 6550 - Contemporary Children's Literature Cr. 3.
OR
- LSCI 6600 - Literature Across the Curriculum Cr. 3.
- LSCI 7000 - Information Literacy Tools and Services Cr. 3.
- LSCI 7030 - Administration of the School Library Cr. 3.
- LSCI 7040 - Technology Engagement and Support for Libraries Cr. 3.
- LSCI 7570 - Contemporary Young Adult Literature Cr. 3

Practicum and Research Coursework

- LSCI 7800 - Library Practicum Cr. 3
- CUED 7910 - Advanced Research Project in Education Cr. 3.

Course Substitutions

Course Substitutions are allowed upon approval of the graduate advisory committee, department chair/director, and dean of the college.

Curriculum and Instruction, Literacy Concentration, Ed.S.

Curriculum and Instruction, Ed.S. Program Information

Degree Requirements

- **Core Concentration Coursework:** 27 hours
- **Research Coursework:** 3 hours
- **Total Degree Requirements:** 30 hours

Core Concentration Coursework

- READ 6100 - Uses of Technology in Literacy Education Cr. 3.
- READ 6340 - Literacy in the Elementary School Cr. 3.
- READ 6350 - Literacy in the Secondary School Cr. 3.
- READ 6700 - Diversity and Equity in Literacy Cr. 3.
- READ 6310 - Assessment and Intervention in Literacy Cr. 3.
- ELED 7400 - The Literacy Language Arts Program Cr. 3.
- READ 7370 - Linguistics: Theory and Application for Educators Cr. 3.
- READ 7500 - Leadership in Literacy Education Cr. 3.
- READ 7800 - Practicum Experiences in Literacy Cr. 3.

Research Coursework

- CUED 7910 - Advanced Research Project in Education Cr. 3.

Course Substitutions

Course Substitutions are allowed upon approval of the graduate advisory committee, department chair/director, and dean of the college.

Curriculum and Instruction, Music Concentration, M.A.

Curriculum and Instruction, M.A. Program Information

Degree Requirements

- **Core Concentration Coursework:** 9 hours
- **Research Coursework:** 6 hours
- **Advisor Guided Electives:** 18 hours
- **Total Degree Requirements:** 33 hours

Core Concentration Coursework

- FOED 6020 - Perspectives in American Education Cr. 3.
- CUED 6010 - Curriculum Development and Evaluation Cr. 3.
- FOED 6820 - Applied Educational Assessment Cr. 3.

Research Coursework

- CUED 6300 - Quantitative Educational Research Credit 3.

OR

- CUED 6310 - Qualitative Research in Education Credit 3.
 - CUED 6305 - Quantitative Problems in Curriculum Credit 3.
- OR
- CUED 6315 - Qualitative Problems in Curriculum Credit 3.

Advisor Guided Electives

Students, at the advice of their advisor and/or committee, may take 5000, 6000, or 7000 level courses from the following subject list. (Note that there is a limit of 9 credit hours at the 5000 level.)

- AGED - Agriculture Education
- CTE - Career Technical Education
- CFS - Child and Family Studies
- CUED - Curriculum Education
- ECED - Early Childhood Education
- ECSP - Early Childhood Special Education
- ELED - Elementary Education
- ESLP - English as a Second Language Pedagogy
- FOED - Foundations of Education
- INSL - Instructional Leadership
- LSCI - Library Science
- READ - Reading
- SEED - Secondary Education
- SPED - Special Education
- ABAP - Applied Behavioral Analysis
- EDU - Education
- EDUB - Behavior
- EDUC - Young Children
- EDUL - Literacy
- EDUP - Program Planning & Evaluation
- EDUS - STEM Education
- CSED - Computer Science Education
- ESOL - English as a Second or Other Language
- SVCL - Service Learning
- EXPW - Exercise, Physical Education and Wellness
- HEC - Human Ecology
- MUS - Music
- MUED - Music Education
- EDUH - Health Behavior/Wellness Education

Course Substitutions

Course Substitutions are allowed upon approval of the graduate advisory committee, department chair/director, and dean of the college.

Curriculum and Instruction, Secondary Education Concentration, Ed.S.

Curriculum and Instruction, Ed.S. Program Information

Degree Requirements

- **Core Concentration Coursework:** 6-9 hours
- **Practicum and Research Coursework:** 6 hours
- **Advisor Guided Electives:** 15-18 hours
- **Total Degree Requirements:** 30 hours

Core Concentration Coursework

- CUED 6010 - Curriculum Development and Evaluation Cr. 3. *
* If taken at the MA level, student will select another Advisor Guided Elective.
- PSY 7200 - Advanced Educational Psychology Cr. 3.
- FOED 7020 - Philosophy and Public Policy Cr. 3.

Practicum and Research Coursework

- CUED 7801 - Lab and Field Experiences in Education/Technology Focus Cr. 3.
OR
- CUED 7802 - Lab and Field Experiences in Education/Grant Writing Focus Cr. 3.
OR
- CUED 7803 - Lab and Field Experiences in Education/Autoethnography Focus Cr. 3.
- CUED 7910 - Advanced Research Project in Education Cr. 3.

Advisor Guided Electives

Students, at the advice of their advisor and/or committee, may take 6000, or 7000 level courses from the following subject list.

- AGED - Agricultural Education
- CTE - Career Technical Education
- CFS - Child and Family Studies
- CUED - Curriculum Education
- ECED - Early Childhood Education
- ECSP - Early Childhood Special Education
- ELED - Elementary Education
- ESLP - English as a Second Language Pedagogy
- FOED - Foundations of Education
- INSL - Instructional Leadership
- LSCI - Library Science
- READ - Reading
- SEED - Secondary Education

- SPED - Special Education
- ABAP - Applied Behavioral Analysis
- EDU - Education
- EDUB - Behavior
- EDUC - Young Children
- EDUL - Literacy
- EDUP - Program Planning & Evaluation
- EDUS - STEM Education
- CSED - Computer Science Education
- ESOL - English as a Second or Other Language
- SVCL - Service Learning
- EXPW - Exercise, Physical Education and Wellness
- HEC - Human Ecology
- MUS - Music
- MUED - Music Education
- EDUH - Health Behavior/Wellness Education

Course Substitutions

Course Substitutions are allowed upon approval of the graduate advisory committee, department chair/director, and dean of the college.

Curriculum and Instruction, Special Education Concentration, Ed.S.

Curriculum and Instruction, Ed.S. Program Information

Degree Requirements

- **Core Concentration Coursework:** 9 hours
- **Research Coursework:** 6 hours
- **Advisor Guided Electives:** 15 hours
- **Total Degree Requirements:** 30 hours

Core Concentration Coursework (9 hours)

- CUED 6010 - Curriculum Development and Evaluation Cr. 3. *
- *If taken at the MA level, student will select another Advisor Guided Elective.
- FOED 7020 - Philosophy and Public Policy Cr. 3.
- SPED 6070 - Individualized Educational Planning Credit 3.

Research Coursework (6 hours)

- CUED 7801 - Lab and Field Experiences in Education/Technology Focus Cr. 3.
- OR
- CUED 7802 - Lab and Field Experiences in Education/Grant Writing Focus Cr. 3.
- OR

- CUED 7803 - Lab and Field Experiences in Education/Autoethnography Focus Cr. 3.
- CUED 7910 - Advanced Research Project in Education Cr. 3.

Advisor Guided Electives

Students, at the advice of their advisor and/or committee, may take 6000, or 7000 level courses from the following subject list.

- AGED - Agricultural Education
- CTE - Career Technical Education
- CFS - Child and Family Studies
- CUED - Curriculum Education
- ECED - Early Childhood Education
- ECSP - Early Childhood Special Education
- ELED - Elementary Education
- ESLP - English as a Second Language Pedagogy
- FOED - Foundations of Education
- INSL - Instructional Leadership
- LSCI - Library Science
- READ - Reading
- SEED - Secondary Education
- SPED - Special Education
- ABAP - Applied Behavioral Analysis
- EDU - Education
- EDUB - Behavior
- EDUC - Young Children
- EDUL - Literacy
- EDUP - Program Planning & Evaluation
- EDUS - STEM Education
- CSED - Computer Science Education
- ESOL - English as a Second or Other Language
- SVCL - Service Learning
- EXPW - Exercise, Physical Education and Wellness
- HEC - Human Ecology
- MUS - Music
- MUED - Music Education
- EDUH - Health Behavior/Wellness Education

Course Substitutions

Course Substitutions are allowed upon approval of the graduate advisory committee, department chair/director, and dean of the college.

Curriculum and Instruction, STEM Education Concentration, Ed.S.

Curriculum and Instruction, Ed.S. Program Information

Degree Requirements

- **Core Concentration Coursework:** 6-9 hours
- **Practicum and Research Coursework:** 6 hours
- **Advisor Guided Electives in STEM courses (EDUS 7500-EDUS 7580):** 6 hours
- **Advisor Guided Electives in STEM Education & Technology Courses:** 9-12 hours
- **Total Degree Requirements:** 30 hours

Core Concentration Coursework

- CUED 6010 - Curriculum Development and Evaluation Cr. 3. *
*If taken at the MA level, student will select another Advisor Guided Elective.
- EDUS 7500 - STEM Education Foundations Cr. 3.
OR
- EDUS 7570 - STEM Education Policy & Leadership Cr. 3.
- CUED 7510 - Instructional Design Foundations Cr. 3.
OR
- CUED 7520 - Teaching and Learning Online Cr. 3.
OR
- CUED 7530 - Designing Integrated Technology Environments Cr. 3.

Practicum and Research Coursework

- CUED 7801 - Lab and Field Experiences in Education/Technology Focus Cr. 3.
- CUED 7910 - Advanced Research Project in Education Cr. 3.

Advisor Guided Electives

Students, at the advice of their advisor and/or committee, may take 6000, or 7000 level courses from the following subject list.

- AGED - Agricultural Education
- CTE - Career Technical Education
- CFS - Child and Family Studies
- CUED - Curriculum Education
- ECED - Early Childhood Education
- ECSP - Early Childhood Special Education
- ELED - Elementary Education
- ESLP - English as a Second Language Pedagogy
- FOED - Foundations of Education
- INSL - Instructional Leadership
- LSCI - Library Science
- READ - Reading
- SEED - Secondary Education
- SPED - Special Education
- ABAP - Applied Behavioral Analysis

- EDU - Education
- EDUB - Behavior
- EDUC - Young Children
- EDUL - Literacy
- EDUP - Program Planning & Evaluation
- EDUS - STEM Education
- CSED - Computer Science Education
- ESOL - English as a Second or Other Language
- SVCL - Service Learning
- EXPW - Exercise, Physical Education and Wellness
- HEC - Human Ecology
- MUS - Music
- MUED - Music Education
- EDUH - Health Behavior/Wellness Education

Course Substitutions

Course Substitutions are allowed upon approval of the graduate advisory committee, department chair/director, and dean of the college.

Department of Exercise Science, Physical Education, and Wellness

Department of Exercise Science

Departmental Overview

The department offers an online Master of Arts degree in Exercise Science with areas of concentration in elementary/middle school physical education, fitness and lifetime wellness, adapted physical education, and sport management. Additionally, candidates may choose to take 20 directed hours in conjunction with the elementary/middle school concentration in pursuit of a Tennessee teaching license in k-12 physical education and health. The elementary/middle school concentration and the teacher licensure program are accredited by the Council for the Accreditation of Educator Preparation (CAEP). Field experience, internships and practicum work can be performed at the student's location and monitored through the online platform. Candidates complete comprehensive exams online through the required Tk20 student account, eliminating the need for any Master of Arts student to ever have to come to campus.

The following are brief descriptions of each of the concentrations:

- **Adapted Physical Education** - Typically, this concentration provides current practitioners with coursework, theory and practice to effectively lead physical education programs for individuals with special needs.
- **Elementary and Middle School Physical Education** - This concentration is designed for students who have a current Tennessee teaching license who either want to enhance their pedagogical knowledge and/or gain background knowledge in physical education in preparation to sit for the physical education PRAXIS exam in seeking the physical education endorsement on the Tennessee teaching license.

- **Fitness and Lifetime Wellness** - Students who are interested in health, wellness and/or performance aspects of physical activity and training will be interested in this concentration. The main focus is on practical application rather than clinical rehabilitation.
- **Sport Management** - Anyone wanting to work as an administrator in various positions within the sports industry will be interested in this concentration.
- **Teacher Licensure Option** - Students who wish to pursue obtaining an initial Tennessee teaching license in physical education and health will declare elementary and middle school physical education in the Master of Arts program but must also consult with the Office of Teacher Education for admission to the teacher education program and addition 20 hours of directed coursework. Any candidate wanting to pursue the teaching license must communicate directly with the Office of Teacher Education during the first semester as a Master of Arts student to be on track for timely completion of the teacher licensure option.

Curriculum & Instruction Ed.S.

Exercise Science Concentration

A Flexible Online Program

To find out more, visit the C&I Ed.S. web page:

Exceptional Learning Ph.D.

Health Behaviors & Wellness Education (HBWE)

- This concentration offers cutting-edge, hands-on experiential courses along with related pedagogical methods and theory.
- HBWE research courses supply additional opportunities to research and address discipline-specific concerns.
- The comprehensive and novel design supplies students with the knowledge, skills, and abilities necessary to succeed professionally and lead change in health sciences and wellness disciplines.
- Graduate assistantships available.

Departmental Admission Requirements for Online Master of Arts

Applicants are expected to have earned a BS degree from an approved program. There are no restrictions on undergraduate programs of study. Admission is decided based on a multi-parameter criterion that can include the following and will be evaluated by the graduate faculty in the department:

1. Minimum undergraduate GPA of 2.5 for provisional admission and a minimum 2.75 undergraduate GPA for full standing;
2. Minimum of two (2) letters of recommendation from individuals who can address scholarly aptitude;
3. All undergraduate transcripts;
4. Candidate provide a writing sample from an undergraduate 4000 level class or complete a writing prompt (defined and provided by the department);
5. Letter of Intent outlining the purpose and proposed outcomes of being in the program;
6. Participation in interview with departmental faculty if required.

Based on the level of satisfaction of the above criteria, the department will either recommend admission to full standing, provisional standing, or deny admission. Standing status may be changed to Full standing after the student satisfies requirements specified by the department at the time of admission or upon departmental review.

BA/MA Fast Track Program

The Fast Track program is designed to enable TTU College of Education undergraduates to accumulate up to six (6) credit hours of graduate coursework, to satisfy both undergraduate and graduate degree requirements, while still pursuing their undergraduate degree. The coursework would enable an efficient graduate program transition with the potential for accelerated completion. The courses must be taken at Tennessee Tech University.

The minimum admissions requirements for participating in the Exercise Science, Physical Education, and Wellness program Fast Track Program are:

- Enrolled in Tennessee Tech as an undergraduate Exercise Science major with at least 90 hours of completed courses within their program of study,
- Overall GPA of 3.25 or better,
- Recommendation from the undergraduate advisor, and
- Approval by departmental coordinator of graduate studies.

Fast Track program participants should consult with the undergraduate and graduate advisors regarding enrollment in the appropriate courses and must earn a minimum grade of "B" in the identified courses to apply them to their MA program of study.

Courses to be included in the Fast Track program include:

Dual listed courses:

EXPW 4520/5520 - Adapted Physical Education and Sport

EXPW 4730/5730 - Assessment in Exercise Science

EXPW 4440/5440 - Exercise Physiology

EXPW 4042/5042 - Health Promotion

(Courses listed at the 5000 level will include additional graduate coursework and a culminating project in each course.)

Graduate courses:

EXPW 6140 - Assessment and Strategies for Adapted Physical Education

EXPW 6240 - Assessment in Sport, Physical Education and Wellness

EXPW 6440 - Physiology of Exercise

EXPW 6042 - Health Promotions

In addition to requirements for admission to the Fast Track BS/MA program, all requirements for admission to the College of Graduate Studies must also be met upon graduation. Meeting the minimum requirements does not guarantee admission to the graduate program.

Christy Killman, Chairperson and Departmental Graduate Coordinator/Advisor

Departmental Graduate Faculty: Christy Killman, Ajit Korgaokar, David Mann, Anthony Mortara, Greg Palevo, Michael Phillips, Jessica Richards, Scott Smith, and Lisa Witherspoon

Master of Arts

Exercise Science, Adapted Physical Education Concentration, M.A.

Degree Requirements

The Master of Arts in Exercise Science is a 30-33 credit hour degree program. Teacher Licensure is available and requires an additional 20 hours to obtain such licensure. Degree requirements are summarized as follows:

Degree Requirement

- **Core Required Courses:** 6 hours.
- **Research Project Course Requirement:** 9 hours
- **Concentration Required Courses:** 15-18 hours.
- **Total Degree Requirement:** 30-33 hours

At least 70% of courses taken must be at the 6000 level.

Core Required Courses (6 hours)

- EXPW 6230 - Seminar in Exercise Science Cr. 3.
- EXPW 6240 - Assessment in Exercise Science Cr. 3.

Capstone Research Project Course Requirement (9 hours)

- EXPW 6510 - Research Methods Cr. 3.
- EXPW 6530 - Qualitative Research in Exercise Science Credit 3.
- EXPW 6550 - Capstone Project Credit 3.

Adapted Physical Education Concentration (15 hours)

- SPED 6010 - Survey of Disability Characteristics, Procedures, and Methods in Special Education Cr. 3.
- SPED 6060 - Education of Orthopedic and Motor Impaired Cr. 3.
- EXPW 6140 - Assessment and Strategies for Adapted Physical Education Cr. 3.
- Electives - 6 credit hours from any EXPW 5000-6000 or SPED 5000-6000 level course.

Course Substitutions

Course Substitutions are allowed upon approval of the graduate advisory committee, department chair/director, and dean of the college.

Exercise Science, Elementary & Middle School Physical Education Concentration, M.A.

Degree Requirements

The Master of Arts in Exercise Science is a 30-33 credit hour degree program. Teacher Licensure is available and requires an additional 20 hours to obtain such licensure. Degree requirements are summarized as follows:

Degree Requirement

- **Core Required Courses:** 6 hours.
- **Research Project Course Requirement:** 9 hours
- **Concentration Required Courses:** 15-18 hours.
- **Total Degree Requirement:** 30-33 hours

At least 70% of courses taken must be at the 6000 level.

Core Required Courses (6 hours)

- EXPW 6230 - Seminar in Exercise Science Cr. 3.
- EXPW 6240 - Assessment in Exercise Science Cr. 3.

Capstone Research Project Course Requirement (9 hours)

- EXPW 6510 - Research Methods Cr. 3.
- EXPW 6530 - Qualitative Research in Exercise Science Credit 3.
- EXPW 6550 - Capstone Project Credit 3.

Elementary & Middle School Physical Education Concentration (15 hours)

- EXPW 6210 - Curriculum Design in Physical Education Cr. 3.
- EXPW 6350 - Instructional Strategies for Physical Education Cr. 3.
- EXPW 6450 - Teaching Middle School Physical Education Cr. 3.
- EXPW 6140 - Assessment and Strategies for Adapted Physical Education Cr. 3.
- OR
- EXPW 6250 - Applied Motor Development and Motor Learning Cr. 3.
- OR
- EXPW 6700 - Independent Study Cr. 1-3.
- Electives - 3 credit hours from any EXPW 5000-6000 level course.

Teacher Licensure Option (EMPE requirement plus 20 credit hours for licensure)

Student must be admitted to Teacher Education program.

- EXPW 6140 - Assessment and Strategies for Adapted Physical Education Cr. 3.
- EXPW 6210 - Curriculum Design in Physical Education Cr. 3.
- EXPW 6350 - Instructional Strategies for Physical Education Cr. 3.
- EXPW 6450 - Teaching Middle School Physical Education Cr. 3.
- Advisor Guided Elective - 3 credit hours. (EXPW 5000,6000, or 7000 level)

Licensure Requirement (20 credit hours)

(Only students whose concentration is EMPE may take the additional 20 hours to gain the k-12 PE teaching license.)

- EXPW 6100 - Instruction in Physical Education Cr. 3.
- EXPW 6595 - Field Experience in Physical Education Cr. 3.
- EXPW 6880 - Student Teaching in Physical Education Cr. 9.

- EXPW 6881 - Professional Seminar in Physical Education Cr. 2.
- EXPW 6440 - Physiology of Exercise Cr. 3.
OR
- EXPW 5940 - Fitness and Wellness Cr. 3.

Course Substitutions

Course Substitutions are allowed upon approval of the graduate advisory committee, department chair/director, and dean of the college.

Exercise Science, Fitness and Lifetime Wellness Concentration, M.A.

Degree Requirements

The Master of Arts in Exercise Science is a 30-33 credit hour degree program. Teacher Licensure is available and requires an additional 20 hours to obtain such licensure. Degree requirements are summarized as follows:

Degree Requirement

- **Core Required Courses:** 6 hours
- **Research Project Course Requirement:** 9 hours
- **Concentration Required Courses:** 15-18 hours
- **Total Degree Requirement:** 30-33 hours

At least 70% of courses taken must be at the 6000 level.

Core Required Courses (6 hours)

- EXPW 6230 - Seminar in Exercise Science Cr. 3.
- EXPW 6240 - Assessment in Exercise Science Cr. 3.

Capstone Research Project Course Requirement (9 hours)

- EXPW 6510 - Research Methods Cr. 3.
- EXPW 6530 - Qualitative Research in Exercise Science Credit 3.
- EXPW 6550 - Capstone Project Credit 3.

Fitness and Lifetime Wellness Concentration (15 hours)

- EXPW 5940 - Fitness and Wellness Cr. 3.
- EXPW 6042 - Wellness Promotion Cr. 3.
- EXPW 6440 - Physiology of Exercise Cr. 3.
- EXPW 6250 - Applied Motor Development and Motor Learning Cr. 3.
OR
- EXPW 6590 - Field Experience Cr. 3.

OR

- EXPW 6720 - Legal, Ethical & Risk Management Issues in Sport Management Cr. 3.
- Elective - 3 credit hours from any EXPW 5000-6000 level course.

Course Substitutions

Course Substitutions are allowed upon approval of the graduate advisory committee, department chair/director, and dean of the college.

Exercise Science, Sport Management Concentration, M.A.

Degree Requirements

The Master of Arts in Exercise Science is a 30-33 credit hour degree program. Teacher Licensure is available and requires an additional 20 hours to obtain such licensure. Degree requirements are summarized as follows:

Degree Requirement

- **Core Required Courses:** 6 hours
- **Research Project Course Requirement:** 9 hours
- **Concentration Required Courses:** 15-18 hours
- **Total Degree Requirement:** 30-33 hours

At least 70% of courses taken must be at the 6000 level.

Core Required Courses (6 hours)

- EXPW 6230 - Seminar in Exercise Science Cr. 3.
- EXPW 6240 - Assessment in Exercise Science Cr. 3.

Capstone Research Project Course Requirement (9 hours)

- EXPW 6510 - Research Methods Cr. 3.
- EXPW 6530 - Qualitative Research in Exercise Science Credit 3.
- EXPW 6550 - Capstone Project Credit 3.

Sport Management Concentration (18 hours)

- EXPW 6710 - Leadership and Management in Sport Cr. 3.
- EXPW 6720 - Legal, Ethical & Risk Management Issues in Sport Management Cr. 3.
- EXPW 6730 - Administration and Supervision of Sport Cr. 3.
- EXPW 6740 - Sport Marketing and Promotions Cr. 3.
- EXPW 6750 - Design & Management of Leisure & Sport Facilities Cr. 3.
- EXPW 6760 - Internship in Sport Management Cr. 3.

Course Substitutions

Course Substitutions are allowed upon approval of the graduate advisory committee, department chair/director, and dean of the college.

Department of Instructional Leadership

Instructional Leadership, M.A.

<https://www.tntech.edu/education/ci/graduate.php>

Instructional Leadership, M.A. Program Information

Degree Requirements

The Master of Arts in Instructional Leadership is a 33-hour degree program. This program prepares educational professionals for administrative career advancement.

- **Core Coursework:** 27 hours
- **Research Coursework:** 6 hours
- **Total Degree Requirements:** 33 hours

Core Coursework

- INSL 6510 - School Leadership, Law, Ethics, and Diversity Cr. 6.
- INSL 6560 - Technology for Administrators Cr. 3.
- INSL 6520 - School-Based Management and Community Relations Cr. 6.
- INSL 6530 - Data Driven Curriculum: Development, Assessment and Evaluation Cr. 6.
- INSL 7010 - Instructional Leadership Cr. 3.
- INSL 7400 - School Leadership and Supervision Cr. 3.

Research Coursework

- CUED 6300 - Quantitative Educational Research Credit 3. OR
- CUED 6310 - Qualitative Research in Education Credit 3.
- CUED 6305 - Quantitative Problems in Curriculum Credit 3. OR
- CUED 6315 - Qualitative Problems in Curriculum Credit 3.

Course Substitutions

Course Substitutions are allowed upon approval of the graduate advisory committee, department chair/director, and dean of the college.

Learning Design and Technology, (MA)

The MA in Learning Design and Technology is an innovative program designed to prepare professionals in face-to-face and virtual positions in instructional design, virtual learning, and computer science education. Areas of the curriculum have flexibility that extends to the candidate's professional expertise. Emphasis is placed on leveraging technologies to enhance learning outcomes, including the use of multimedia, simulations, XR, and online platforms.

Total Degree Requirements (33 Hours)

Core Concentration Coursework*	27 hours
Research Coursework	6 hours
Total Degree Requirements	33 hours

Core Concentration Coursework (27 Hours)

Note: Core Concentration Courses listed below and denoted with * meet the Computer Science Education Optional Embedded Certificate requirements. Core Concentration Courses denoted with ** meet the Instructional Design & Virtual Teaching Embedded Certificate Requirements.

- CSED 6000 - Digital Literacy and Computing Cr. 3. *
- CSED 6010 - Programming Fundamentals and Computational Thinking for Educators Cr. 3. *
- CSED 6020 - Computer Science Concepts and Design Cr. 3. *
- OR
- CUED 7520 - Teaching and Learning Online Cr. 3.
- CSED 6030 - Computer Science Instructional Methods Cr. 3. *
- OR
- CUED 6440 - Emerging Technologies in Education Cr. 3.
- FOED 6820 - Applied Educational Assessment Cr. 3.
- CUED 6430 - Design Studio: Production of Instructional Materials Cr. 3. **
- CUED 6450 - Immersive Technologies for Teaching and Learning Cr. 3. **
- CUED 7510 - Instructional Design Foundations Cr. 3. **
- CUED 7540 - Applied Instructional Design and Learning Analytics Credit 3. **

Research Coursework (6 Hours)

- CUED 6300 - Quantitative Educational Research Credit 3.
- OR
- CUED 6310 - Qualitative Research in Education Credit 3.
- CUED 6305 - Quantitative Problems in Curriculum Credit 3.
- OR
- CUED 6315 - Qualitative Problems in Curriculum Credit 3.

Instructional Leadership, M.A. Program Information

The Instructional Leadership (INSL) online program prepares graduate candidates seeking licensure for positions as school administrators in the state of Tennessee.

Admissions Requirements

In addition to the Department of Curriculum and Instruction Master's admission requirements, additional requirements for applicants of the M.A. in Instructional Leadership (INSL) program are:

1. A valid TN teaching license
2. A minimum of two (2) years teaching experience required.

Graduation Requirements

- The candidate must pass the praxis exam, School Leaders Licensure Assessment (SLLA)
- Each candidate will be instructed to register for the School Leaders Licensure Assessment (SLLA) at the appropriate time during their program of study by an INSL advisor.

Instructional Leadership, Ed.S.

<https://www.tntech.edu/education/ci/graduate.php>

Instructional Leadership, Ed.S. Program Information

Degree Requirements

The Education Specialist degree (Ed.S.) is a 30-hour degree program. This program prepares educational professionals for positions as school administrators in the state of Tennessee.

- **Core Coursework:** 24 hours
- **Research Coursework:** 6 hours
- **Total Degree Requirements:** 30 hours

Core Coursework:

- INSL 7510 - School Leadership Law and Ethics Cr. 6.
- INSL 7520 - Human Resources Management and Public Relations Cr. 6.
- INSL 7530 - Assessment and Evaluation: Improvement in Teaching Cr. 6.
- INSL 7010 - Instructional Leadership Cr. 3.
- INSL 7400 - School Leadership and Supervision Cr. 3.

Research Coursework

- CUED 7801 - Lab and Field Experiences in Education/Technology Focus Cr. 3.
OR
- CUED 7802 - Lab and Field Experiences in Education/Grant Writing Focus Cr. 3. OR
- CUED 7803 - Lab and Field Experiences in Education/Autoethnography Focus Cr. 3.
- CUED 7910 - Advanced Research Project in Education Cr. 3.

Course Substitutions

Course Substitutions are allowed upon approval of the graduate advisory committee, department chair/director, and dean of the college.

Instructional Leadership, Ed.S. Program Information

The Instructional Leadership (INSL) online program prepares graduate candidates seeking licensure for positions as school administrators in the state of Tennessee.

Admissions Requirements

In addition to the Department of Curriculum and Instruction Specialist in Education admission requirements, additional requirements for applicants of the Ed.S. in Instructional Leadership (INSL) program are:

1. A valid TN teaching license
2. A minimum of two (2) years teaching experience require.

Graduation Requirement

- The candidate must pass the praxis exam, School Leaders Licensure Assessment (SLLA)
- Each candidate will be instructed to register for the School Leaders Licensure Assessment (SLLA) at the appropriate time during their program of study by and INSL advisor.

Department of Learning Design and Technology

Learning Design and Technology, (MA)

The MA in Learning Design and Technology is an innovative program designed to prepare professionals in face-to-face and virtual positions in instructional design, virtual learning, and computer science education. Areas of the curriculum have flexibility that extends to the candidate's professional expertise. Emphasis is placed on leveraging technologies to enhance learning outcomes, including the use of multimedia, simulations, XR, and online platforms.

Total Degree Requirements (33 Hours)

Core Concentration Coursework*	27 hours
Research Coursework	6 hours
Total Degree Requirements	33 hours

Core Concentration Coursework (27 Hours)

Note: Core Concentration Courses listed below and denoted with * meet the Computer Science Education Optional Embedded Certificate requirements. Core Concentration Courses denoted with ** meet the Instructional Design & Virtual Teaching Embedded Certificate Requirements.

- CSED 6000 - Digital Literacy and Computing Cr. 3. *
- CSED 6010 - Programming Fundamentals and Computational Thinking for Educators Cr. 3. *
- CSED 6020 - Computer Science Concepts and Design Cr. 3. *

OR

- CUED 7520 - Teaching and Learning Online Cr. 3.
 - CSIED 6030 - Computer Science Instructional Methods Cr. 3. *
- OR
- CUED 6440 - Emerging Technologies in Education Cr. 3.
 - FOED 6820 - Applied Educational Assessment Cr. 3.
 - CUED 6430 - Design Studio: Production of Instructional Materials Cr. 3. **
 - CUED 6450 - Immersive Technologies for Teaching and Learning Cr. 3. **
 - CUED 7510 - Instructional Design Foundations Cr. 3. **
 - CUED 7540 - Applied Instructional Design and Learning Analytics Credit 3. **

Research Coursework (6 Hours)

- CUED 6300 - Quantitative Educational Research Credit 3.
- OR
- CUED 6310 - Qualitative Research in Education Credit 3.
 - CUED 6305 - Quantitative Problems in Curriculum Credit 3.
- OR
- CUED 6315 - Qualitative Problems in Curriculum Credit 3.

Certificate

Students Engaging, Responding, Volunteering, & Impacting Communities Everywhere (SERVICE) Certificate

Students

Engaging, Responding, Volunteering, & Impacting Communities Everywhere (SERVICE) Certificate

The Students Engaging, Responding, Volunteering, & Impacting Communities Everywhere (SERVICE) Certificate requires 12 credit hours of coursework (or equivalent). The certificate requires 6 credit hours of coursework to come from the College of Education and provides the option of the additional 6 hours to be attained from any TTU unit with appropriate service-learning courses/options available. Service-Learning opportunities are available in a number of courses offered by the Department of Curriculum and Instruction, but students may also accumulate hours by self-identifying and pursuing service learning opportunities in the community.

Up to 6 credit hours of the 12 required may be certified by completing the equivalent of 90 clock hours (1 credit hour = 15 clock hours) of service learning. These hours must be pre-approved by the TTU Office of Service Learning who will track hours accumulated and maintain records of completion. Students will be able to count these hours in the certificate by enrolling in a Service-Learning course (zero credits; no cost) in the semester in which the hours are completed.

1. The definition(s) of Service Learning as documented by the TTU Office of Service Learning will be used to guide decisions concerning what activities can be approved for the certificate. Decisions of that office will preside.
2. Coursework/clock hours for service learning in which students are receiving compensation (e.g., paid tutoring) and/or financial gain (e.g., scholarships) cannot be counted for the certificate as this would constitute double-dipping.

Students may choose from among the courses listed below. Special topics courses can be offered at both undergraduate and graduate levels as needed to provide additional opportunities. Please talk with the Department of Curriculum & Instruction for details.

Students may also take any course certified by the TTU Office of Service Learning as eligible (see their website each semester for updated lists).

Certificate Requirements

- **College of Education Courses (see appropriate list of courses below):** 6-12 credit hours*
- **Advisor Guided Electives (see appropriate list of courses below) or Pre-Approved clock hours:** 6 credit hours
- **TOTAL:** 12 credit hours

*Note: Certificate requires 6 credit hours of coursework to come from within the College of Education. (See list of course prefixes listed below.)

Courses Open to Education Majors

- SEED 4322 (5322) - Teaching Algebra in Middle/High School Cr. 3.
- SPED 4200 (5200) - Teaching Students with Autism Spectrum Disorders Cr. 3.

Courses Open to All Majors

- CUED 4750 (5750) - Service Learning Informal STEM Education Cr. 0-3.
- CUED 4850 (5850) - Workshop in Education Cr. 1-6.
- CUED 4900 (5900) - Study Abroad Cr. 1-6.
- CUED 6750 (7750) - Service Learning Informal STEM Education Cr. 0-3.
- SVCL 4150 (5150) - Topics Cr. 0-9.
- SVCL 6150 (7150) - Topics Cr. 0-9.
- SVCL 4920 (5920) - Service Learning in Your Community Cr. 0-3.
- SVCL 6920 (7920) - Service Learning in Your Community Cr. 0-3.

College of Education Course Prefixes

- CTE - Career Technical Education
- CFS - Child and Family Studies
- CUED - Curriculum Education

- ECED - Early Childhood Education
- ECSP - Early Childhood Special Education
- ELED - Elementary Education
- ESLP - English as a Second Language Pedagogy
- FOED - Foundations of Education
- INSL - Instructional Leadership
- LSCI - Library Science
- READ - Reading
- SEED - Secondary Education
- SPED - Special Education
- ABAP - Applied Behavioral Analysis
- EDU - Education
- EDUB - Behavior
- EDUC - Young Children
- EDUL - Literacy
- EDUP - Program Planning & Evaluation
- EDUS - STEM Education
- CSED - Computer Science Education
- ESOL - English as a Second or Other Language
- SVCL - Service Learning
- EXPW - Exercise, Physical Education and Wellness
- HEC - Human Ecology
- MUS - Music
- MUED - Music Education
- EDUH - Health Behavior/Wellness Education

Computer Science Education Certificate

Computer Science Education Certificate

The Certificate in Computer Science Education is the first computer science education licensure option in the State of Tennessee. This program allows the preservice and inservice teacher to receive license endorsements, while promoting and integrating computer science education in the K-12 environment. The curriculum is a combination of courses designed around state and national standards for computer science education. The certificate is 12 credit hours, and includes courses in Curriculum and Instruction.

The certificate is open to all graduate students admitted to Tennessee Tech University. Students outside of the Curriculum and Instruction major will coordinate academic advising with the students major advisor and an advisor in Curriculum and Instruction.

Certificate Requirements

- CSED 6000 - Digital Literacy and Computing Cr. 3.
- CSED 6010 - Programming Fundamentals and Computational Thinking for Educators Cr. 3.
- CSED 6020 - Computer Science Concepts and Design Cr. 3.
- CSED 6030 - Computer Science Instructional Methods Cr. 3.

Total hours required: 12

Instructional Design and Virtual Teaching Certificate

The Instructional Design and Virtual Teaching certificate program is designed to enhance current concentrations within Curriculum and Instruction and create new pathways for faculty, administration, and students in this rapidly expanding field. This certificate is open to all graduate students at Tennessee Tech.

- **Core Required Courses:** 12 hours.
- **TOTAL:** 12 hours

The certificate consists of a four-course sequence that is developed to support and prepare professionals for the challenges and opportunities of instructional design and virtual teaching principles. The certificate has a defined set of four core courses for a total of 12 hours. Core course requirements include the following courses:

Certificate Requirements (12 Hours)

- CUED 6430 - Design Studio: Production of Instructional Materials Cr. 3.
- CUED 6450 - Immersive Technologies for Teaching and Learning Cr. 3.
- CUED 7510 - Instructional Design Foundations Cr. 3.
- CUED 7540 - Applied Instructional Design and Learning Analytics Credit 3.

College of Engineering

The College of Engineering offers programs leading to the degrees of Master of Science and Doctor of Philosophy in Engineering. The Master of Science is offered with majors in chemical engineering, civil engineering, computer science, electrical and computer engineering, engineering management, and mechanical engineering. The Doctor of Philosophy in Engineering is an interdisciplinary degree program under the direction of the advisory committees formed for each major. The Doctor of Philosophy in Engineering offers specialization in chemical engineering, civil engineering, computer science, electrical and computer engineering, and mechanical engineering.

Each M.S. and Ph.D. student has an advisory committee of faculty members which helps to guide the student's studies and progress toward completion of degree requirements. The chairperson of the committee, who must be a faculty member from the department in which the student is majoring, has special responsibility to assist the student with development of an individualized program of study and appropriate research goals.

The College operates two (2) State of Tennessee supported Centers of Excellence: Center for Manufacturing Research (CMR) and Center for Energy Systems Research (CESR). In addition, the Cybersecurity Education, Research, and Outreach Center (CEROC), established in 2016, has begun to receive State support since July of 2017. All of these centers support laboratories and facilities to support research and education in their respective areas. For additional details, refer to the College of Engineering website under "Research and Innovation".

Financial aid is available through individual departments and centers in the form of teaching or research assistantships. Full assistantships pay tuition and fees plus a monthly stipend. Partial assistantships, which pay a prorated share of tuition, fees, and a monthly stipend, are sometimes awarded.

- College of Engineering Information

Dr. Joseph C. Slater, Dean

Department and Program Information

Doctor of Philosophy

Engineering, Ph.D.

Admission Requirements

A graduate program leading to a Doctor of Philosophy (Ph.D.) degree in Engineering is offered by the College of Engineering. When applying for admission, a student must state on the application the specialization area of study for which admission is requested.

The basic admission standards for the Ph.D. program are the same as for the MS programs, except that, additionally, an applicant is expected to have completed an MS degree in an academic area appropriate to the proposed area of study and to have earned an MS GPA of at least 3.5 on a 4.0 scale.

Though the general requirement for admission to the Ph.D. program is a master's degree in an appropriate discipline, students with a bachelor's degree may be admitted to the Ph.D. program directly on exceptional basis, provided the applicant has a record of excellent academic performance in an appropriate engineering program undergraduate program. The applicant's test scores, personal recommendations, and relevant work experience must indicate a high potential for success in doctoral studies and research. In addition, factors such as appropriateness of the applicant's research objectives to the research interests of the program faculty, availability of faculty to supervise the applicant's research, and prior research accomplishments of the applicant will also influence the admission decision.

Fulfilling the minimum requirement does not guarantee admission; an applicant who does not meet the above minimum but appears to have reasonable potential for success as a Ph.D. student, may be admitted to provisional standing. His/her status may be changed to full standing after satisfying requirements specified by the Associate Dean of Engineering for Graduate Studies and Research, in consultation with the appropriate departmental chairperson, at the time of admission.

If admitted in provisional standing at either the MS or Ph.D. level, the student must remove all deficiencies and apply for reclassification to full standing prior to the completion of 15 graduate hours.

Sometimes a master's-level student takes more graduate-level courses than are required for the degree because the student is expecting to continue on to the Ph.D. program and hopes to use the extra courses to satisfy the Ph.D. coursework requirement. When this is the case, the student can request when registering for the course(s) that the course(s) be "banked" for the Ph.D. program. If the student lacks no more than 12 semester hours on the master's degree, he/she may accumulate a maximum of nine (9) semester hours which may be applied toward the Ph.D. When this is the case, the student's advisory committee must initiate approval via memo with consensus of the departmental chairperson, dean of the college, and the Director of Graduate Studies. Banked courses then show up on the student's transcript as courses taken for the Ph.D. rather than being shown as a part of his/her M.S. program. Banking course does not guarantee admission to the Ph.D. program, or, if admitted, that the student's Ph.D. advisory committee will approve the course as part of the student's Ph.D. program of study.

Degree Requirements

The Ph.D. is a research degree. The minimum requirements for a Ph.D. degree in the College of Engineering stated below are the same for all departments. Each department may include additional degree requirements for students pursuing a concentration in that department.

Ph.D. Concentration Areas Include:

- Chemical Engineering
- Computer Science

- Civil Engineering
- Electrical and Computer Engineering
- Mechanical Engineering

Students Admitted with a Master's Degree

- **Advisor Approved Coursework (6 credit hours must be 7000 level courses)*:** 18 hours
 - **Concentration Coursework*:** 6 hours
 - **Research and Dissertation (7990 COURSE):** 24 hours
 - **Total Degree Requirement:** 48 hours
1. A minimum of 48 credits of course work and doctoral research and dissertation as follows:
 - A. A minimum of eighteen (18) credit hours of course work beyond the master's degree, including six (6) credit hours of 7000-level courses acceptable to the student's advisory committee. Additional six (6) credit hours of either graduate level course work or research experience as per the policy of the student's major department. No 5000-level courses are to be used to meet the minimum requirements of course work.
 - B. A minimum of twenty four (24) credit hours of doctoral research and dissertation built upon the student's course of study and making a significant contribution to the state of knowledge or to the art of the engineering profession, is required; not more than nine (9) credit hours may be earned in a particular semester.
 2. Residence of four (4) semesters beyond the master's degree, with at least two (2) semesters in continuous residence, is required. All requirements, including the dissertation, must be completed within a period of eight (8) consecutive years.
 3. Maintenance of a minimum quality point average of 3.0 and adherence to the general regulations of the College of Graduate Studies are expected.

All students in the program must follow a plan of study and research developed in conjunction with an advisory committee, satisfactorily complete a comprehensive examination, achieve candidacy, and satisfactorily defend their dissertation.

Students Admitted Directly from the Bachelor's Degree into the Ph.D. Degree Program

- **Advisor Approved Coursework (minimum 6 credit hours of 7000-level courses) (maximum 9 credit hours of 5000-level courses)*:** 42 hours
- **Concentration Coursework*:** 6 hours
- **Research and Dissertation (7990 COURSE):** 24 hours
- **Total Degree Requirements:** 72 hours

A student admitted with a bachelor's degree on exceptional basis must successfully complete a qualifying examination based mostly on undergraduate materials before the end of the second semester of enrollment. Students with a Bachelor of Science (B.S.) degree from ABET-accredited programs are exempted from this examination. Other students without such a degree, or M.S. students without an ABET-accredited B.S. degree, switching to direct Ph.D. will have to take a qualifying exam through a formal process established by the department. The process should include at a minimum an examination of the student's fundamental knowledge managed by the Graduate Committee of the department.

Based on the student's performance on the qualifying examination, the student may be (i) permitted to continue in the doctoral program, or (ii) advised to transfer to an M.S. degree program in an appropriate discipline in the college, or (iii) recommended for termination from the graduate program of the college.

If permitted to continue in the doctoral program, the student, as described elsewhere in the catalog, will select a research advisor, form an advisory committee, and submit a program of study satisfying the following requirements.

The program of study should have a minimum total of seventy two (72) credit hours of academic work, consisting of course work and dissertation work, beyond baccalaureate work, subject to the following:

- The program of study should include a minimum of forty two (42) credit hours of appropriate graduate level course work consisting of a minimum of six (6) credit hours at the 7000-level and a maximum of nine (9) credit hours at the 5000-level, acceptable to the student's advisory committee.
- It should also include an additional six (6) credit hours of either graduate level course work or research experience as per the policy of the student's major department.
- A minimum of 24 credit hours of doctoral research and dissertation, built upon the student's course of study and making significant contribution to the state of knowledge and the art of the engineering profession, is required; no more than nine (9) credit hours may be earned in a particular semester.

Students Admitted Directly from the Bachelor's Degree into the Ph.D. Program Earning a Non-thesis M.S. en route

All conditions stated above for the students admitted directly into the Ph.D. program apply. In addition:

Nine (9) credit hours will count toward the non-thesis M.S. degree and toward the Ph.D. degree. If the departmental non-thesis M.S. requires a three (3) credit hour non-thesis project course, those three (3) credit hours can be counted as three (3) credit hours of dissertation research toward the Ph.D. degree. Six (6) credit hours of M.S. coursework can be counted toward the Ph.D. coursework. If no project course is required for the non-thesis M.S., then nine (9) credit hours of M.S. coursework can be counted toward the Ph.D.. (Mechanical Engineering students may apply three (3) credit hours of either ME 6990 Research and Thesis or ME 7990 Research and Dissertation to satisfy the independent learning requirement for the non-thesis M.S. program.)

* Advisor Approved Electives and Concentration Coursework:

Selection of appropriate courses will be made in consultation with the student's advisory committee and/or the graduate coordinator. Courses for each concentration area and Advisor Approved Electives will include:

- Chemical Engineering (CHE 6000, CHE 7000 level courses)
- Computer Science (CSC 6000, CSC 7000 level courses)
- Civil Engineering (CEE 6000, CEE 7000 level courses)
- Electrical and Computer Engineering (ECE 6000, ECE 7000 level courses)
- Mechanical Engineering (ME 6000, ME 7000 level courses)

Limitation on Graduate Assistantships

It is expected that a full-time, post master's Ph.D. Engineering student should be able to achieve candidacy within the first three (3) calendar years after enrollment, and a direct admit Ph.D. Engineering student after four (4) calendar years. If candidacy is not achieved within the aforementioned periods, a student must request and receive approval for an extension of assistantship following the College of Engineering's established procedure. An extension may be granted by the Associate Dean of Engineering for Research and Innovation. This limitation is regardless of student funding or the source of support for the student.

Master of Science

Department of Chemical Engineering

Chemical Engineering, M.S.

Departmental Graduate Faculty: Pedro E. Arce, Laura Arias Chavez, Joseph J. Biernacki, Bahman Ghorashi, Venkat Padmanabhan, J. Robby Sanders, Liquin Zhang.

Chemical Engineering Program Information

Departmental Overview

The Master of Science degree program in the Department of Chemical Engineering is available to individuals who have completed a BS degree in Chemical Engineering or a closely allied field. The MS program's technical content and research component prepares the individual to enter the profession with advanced engineering skills.

Graduate students pursuing the MS degree develop a program of study tailored to their objectives and complete a master's thesis. Research topics in the areas of electric field-based processes and systems, biological engineering processes and systems, molecularly based engineered materials and interfacial systems, and computational mathematics are among those available.

The faculty of the Department of Chemical Engineering actively participates in the Doctor of Philosophy program in Engineering. Admission to the doctoral program is open to individuals with outstanding academic records and potential for original research. The departmental faculty and graduate students work cooperatively with the three State funded Centers of Excellence: two within the College of Engineering and one under the Office of Research & Economic Development.

Master's Degree Option

The MS-CHE program of study with non-thesis option requires a minimum of 34-credit hours of course work and shall include: CHE 6920 - Graduate Seminar (1 credit) to be completed during the first fall semester of study; 9 credit hours of graduate level breadth (core) courses from a list maintained by the CHE department; a minimum of twelve (12) credit hours of graduate level CHE elective courses; a three (3) credit hours CHE 6970; Non-Thesis Design Project course that will enhance independent learning skills, and a maximum of nine (9) hours of graduate level elective courses from outside the department. Additionally, each student should also pass a written exam administered by the department.

Departmental Admission Requirements

The minimum requirements for full standing admission into the MS program are the same as those for any MS program in the College of Engineering and these are stated under the College of Engineering listing. Similarly, the minimum requirements for full standing admission into the Ph.D. program with a major in ChemE are the same as those for the Ph.D. program listed in the College of Engineering session.

Departmental Degree Requirements for Doctor of Philosophy

To receive a Ph.D. with specialization in ChemE, the student shall complete all the requirements for the Ph.D. specified under the College of Engineering section of the catalog.

BS/MS Fast Track - Chemical Engineering

The Chemical Engineering Fast-track Master of Science (MS) program is designed to enable Tennessee Technological University ChE undergraduates to take up to six (6) hours of graduate coursework during the student's junior/senior year which can be used to satisfy both undergraduate and graduate degree requirements. ChE Fast-track MS students receiving their bachelor's degrees at the end of the Spring semester will be expected to complete the MS by the end of the summer term of the following year.

The minimum requirements for acceptance into the Fast-track program are:

Be enrolled as an undergraduate ChE student at TTU with at least Junior standing.

- Have at least an overall GPA of 3.25 and have at least a 3.25 GPA in ChE
- The student must earn a minimum grade of "B" in the graduate courses in order to apply them to their M.S. program of study and to continue in the Fast Track program. Students who do not succeed in their first graduate course during their senior year (B grade or better) will be advised to withdraw from the Fast Track program and complete their B.S. degree in a normal manner.
- In addition to the requirements for admission to the ChE Fast-track MS program, all requirements for admission to the ChE graduate program must also be met upon graduation. Meeting these minimum requirements does not guarantee admission to the graduate program.

Fulfilling the above minimum requirements does not guarantee admission to the Fast Track program. Students who meet the above minimum admission requirements must apply to the Department for admission to the Fast Track program. The department's graduate committee will review the application and make a decision for approval.

Participation in the ChE Fast-track MS program does not change the requirements for either the undergraduate or graduate degree. All students in the MS program take 30 credit hours: 24 hours of coursework and 6 hours of research and thesis.

Non-Thesis Option

The M.S. in Chemical Engineering with non-thesis option requires a minimum of 34 credit hours in coursework and is defined as follows:

Degree Requirements

- **Core Required Course:** 1 hours
- **Advisor Approved Electives*:** 30 hours
- **Non-Thesis Project Course:** 3 hours
- **Total Requirements - Non-Thesis Option:** 34 hours

* Advisor Approved Elective courses may be selected from CHE 5000, 6000, 7000 level courses

Non-Thesis Core Requirement (1 hours)

Non-thesis students will enroll in one hour of seminar.

- CHE 6920 - Chemical Engineering Graduate Seminar Cr. 1.
OR
- CHE 6910 - Chemical Engineering Graduate Seminar Cr. 1.

Non-Thesis Advisor Approved Electives (30 hours)

Selection of appropriate courses (CHE 5000, 6000, 7000 level) will be made in consultation with the student's advisory committee and/or the graduate coordinator.

Non-Thesis Project Requirement (3 hours)

- CHE 6970 - Non-Thesis Design Project Cr. 3.

Thesis Option

The M.S. in Chemical Engineering with the Thesis Option is a 30-hour degree program and is defined as follows:

Degree Requirements

- **Advisor Approved Electives***: 24 hours
- **Thesis Research Hours**: 6 hours
- **Total Requirements - Thesis Option**: 30 hours

* Advisor Approved Elective courses may be selected from CHE 5000, 6000, 7000 level courses

Thesis Advisor Approved Electives (24 hours)

Selection of the appropriate courses (CHE 5000, 6000, 7000 level) will be made in consultation with the student's advisory committee and/or the graduate coordinator.

Thesis Research Requirement (6 hours)

- CHE 6990 - Research and Thesis Cr. 1,3,6,9.

Department of Civil and Environmental Engineering

- Civil and Environmental Engineering Website
- Department of Civil and Environmental Engineering Information

Benjamin J. Mohr, Chairperson

Departmental Graduate Faculty: Julia Avera, Daniel A. Badoe, Steven M. Click, L. K. Crouch, Tiana Datta, R. Craig Henderson, Timothy Huff, X. Sharon Huo, Alfred Kalyanapu, Y. Jane Liu, Benjamin J. Mohr, Guillermo Ramirez, Daniel Vandenberg, Lenly J. Weathers

Departmental Overview

The Department of Civil and Environmental Engineering offers advanced studies leading to the Master of Science degree in Civil Engineering and the Doctor of Philosophy degree in Engineering with specialization in Civil Engineering. The goals of the Ph.D. program are listed under the College of Engineering and administered by the Associate Dean of Engineering for Graduate Studies and Research. The goal of the MS program is to provide the strong academic programs necessary to prepare students to become educated members of society who can join and make significant contributions to the civil engineering profession.

This is accomplished by allowing MS graduate students to specialize in specific engineering topics through advanced and in-depth studies in these topics; by providing guidance to students in fundamental and applied research; by helping them to develop powers of analysis, synthesis and critical thinking; and by preparing outstanding graduate students to continue academic and research careers through doctoral-level studies.

The department offers the Master of Science Degree in Civil Engineering with concentrations in environmental engineering, structural engineering, and transportation engineering. The departmental faculty have expertise and conduct research in the following areas: environmental and water resources engineering; structural engineering, transportation and paving materials; engineering mechanics; and computational mechanics. Faculty advisors assist graduate students in developing individual programs of study depending on their career goals and thesis research interests. The student's advisory committee assists the student in the development and execution of the program of study and monitors and evaluates the student's work towards the degree.

Many departmental faculty actively participate in research related to the three Centers of Excellence operated within the University: two within the College of Engineering and one under the Office of Research & Economic Development. The resources and facilities of the Centers greatly enhance the graduate program of the Department.

Fast-track M.S. Program

The Fast-track M.S. Program in Civil Engineering will provide an opportunity for promising CEE undergraduate students to accelerate the completion of the M.S. by allowing undergraduates to accumulate up to six (6) credit hours of graduate coursework while still pursuing their undergraduate degree and to transition to the graduate program smoothly. Up to six hours of graduate coursework, exclusive of directed study, taken during the student's senior year can be used to satisfy both undergraduate and graduate degree requirements. These courses must be taken at Tennessee Tech University and must be approved as appropriate substitutions in the undergraduate curriculum for senior CEE electives.

Students must apply to the CEE Fast-track M.S. program by the end of their second junior term. Students must apply and take the GRE^(R) General Test (GRE) during their second senior term (one [1] semester prior to their anticipated graduation). The CEE Fast-track students should be aware that they need to consult with their future M.S. advisor for the 5000-level courses taken during their senior terms, especially for the courses not in their area of concentration.

The minimum requirements for acceptance into the Fast-track program are:

- Enrolled in TTU Civil Engineering student with Junior or Senior standing
- Overall GPA of 3.25 and a GPA for CEE courses of at least 3.5
- Recommendation of a CEE faculty mentor
- All requirements for admission to Graduate School must be met upon graduation

Departmental Admission Requirements

The minimum requirements for admission to the MS program are the same as those for any MS program in the College of Engineering and are stated under the College of Engineering listing. The program is designed for graduates of approved undergraduate programs. Thus, a baccalaureate degree in civil engineering is required for full standing. Applicants that have an undergraduate degree in a closely related field will be evaluated on a case-by-case basis and may be admitted to full standing upon completion of identified background courses.

For the admission requirements to the Ph.D. program, please refer to the College of Engineering program listing elsewhere in this catalog.

Departmental Degree Requirements for Doctor of Philosophy

Requirements for the Ph.D. degree in Engineering may be satisfied with a primary emphasis in civil engineering. The degree requirements for the Ph.D. degree are given in the College of Engineering listing. In addition, all candidates must take at least two (2) hours of CEE 6910 - CEE Graduate Seminar.

Civil Engineering, M.S.

Departmental Degree Requirements

To receive an MS degree in CEE, the student should complete all the MS requirements specified by the University and the College of Engineering. Additionally, certain departmental requirements listed below shall also be satisfied:

Thesis Option (31 hours)

An MSCE program of study with thesis option requires a minimum of 31 semester hours of graduate-level coursework which are on the program of study approved by the student's graduate advisory committee, including one semester hour of CEE 6910 - CEE Graduate Seminar, and a minimum of six (6) hours of thesis completed under the supervision of the graduate advisor (31 hours). At least 15 credit hours of graduate coursework must be CEE courses. The required thesis should document the student's research to the satisfaction of both the student's

graduate advisory committee and the Graduate School. The student must also successfully defend his/her thesis before the graduate advisory committee. A minimum GPA of 3.0 is also required. Other departmental requirements may apply.

Degree Requirements

- **Core Required Course:** 1 hour
- **Concentration Area Requirement*:** 15 hours
- **Advisor Approved Electives*:** 9 hours
- **Research Requirement:** 6 hours
- **Degree Total Requirements:** 31 hours

* Concentration Area and Advisor Approved Electives maybe selected from CEE, CHE, CSC, EMGT, ENGR, ME, BIOL, ESS, EVS, GEOG, MATH, OR CHEM 5000, 6000, 7000 level courses.

Core Required Course (1 hour)

- CEE 6910 - CEE Graduate Seminar Cr. 1.

Concentration Area Requirement (15 hours)

Selection of appropriate courses (CEE 5000, 6000, 7000 level) will be made in consultation with the student's advisory committee and/or the graduate coordinator.

Advisor Approved Electives (9 hours)

Selection of appropriate courses (CEE 5000, 6000, 7000 level) will be made in consultation with the student's advisory committee and/or the graduate coordinator.

Research Requirement (6 hours)

- CEE 6990 - Research and Thesis Cr. 1,3,6,9.

Non-Thesis Option (31 hours)

An MSCE program of study with non-thesis option requires a minimum of 31 credit hours of graduate course work, as specified in the student's approved Program of Study. This program is offered in a fully online delivery mode. The program of study shall include 30 semester hours of graduate-level coursework, one semester hour of CEE 6910 - CEE Graduate Seminar. At least 21 credit hours of graduate coursework must be CEE courses. No more than 9 credit hours at the 5000 level are permitted. Non-thesis MSCE will complete a culminating exam to reflect comprehensive knowledge gained from coursework. Successful completion of the exam is required for graduation. Other departmental requirements may apply. Degree Requirements:

- **Core Required Course:** 1 hour.
- **Concentration Area Requirement*:** 21 hours
- **Advisor Approved Electives*:** 9 hours
- **Total Degree Requirements:** 31 hours

* Selection of appropriate courses (CEE 5000, 6000, 7000 level) will be made in consultation with the student's advisory committee and/or the graduate coordinator. Courses may include, but are not limited to, other relevant engineering disciplines (such as CHE, CSC, EMGT, ENGR, or ME) or outside of engineering such as (BIOL, CHEM, ESS, EVS, GEOG, GEOL, or MATH).

Core Required Course (1 hour)

- CEE 6910 - CEE Graduate Seminar Cr. 1.

Concentration Area Requirements (21 hours)

Selection of appropriate courses (CEE 5000, 6000, 7000 level) will be made in consultation with the student's advisory committee and/or the graduate coordinator.

Advisor Approved Electives (9 hours)

Selection of appropriate courses (CEE 5000, 6000, 7000 level) will be made in consultation with the student's advisory committee and/or the graduate coordinator. Courses may include, but are not limited to other relevant engineering disciplines (such as CHE, CSC, EMGT, ENGR, or ME) or outside of engineering (such as BIOL, CHEM, ESS, EVS, GEOG, GEOL, or MATH).

Department of Computer Science

Computer Science, M.S.

Departmental Overview

The Department offers a Master of Science in Computer Science (MSCS) and a specialization in Computer Science within the PhD program in the College of Engineering.

The MSCS is available to students in the form of three options: *thesis, project, and coursework-only*. All students take a 1-hour graduate seminar. Those who select the thesis option take 6 credit hours of research in addition to 24 hours of approved graduate coursework. Students taking the project option take 3 credit hours of project work in addition to 30 hours of approved graduate coursework, and students in the coursework-only option take 3 credit hours of independent study in addition to a minimum of 30 hours of approved graduate coursework.

Students can pursue a PhD with specialization in Computer Science, through the College of Engineering PhD Program. The purpose of the PhD Program is to provide students with an opportunity for advanced studies and research in the field of engineering. As a research-based degree, the focus is on developing the independent learning skills of students in preparation for advanced-level, research-focused employment in industry or academia.

The faculty are active in a wide variety of research areas, and interested students should refer to the departmental web-site for specific details. The mission of the CS department, consistent with the mission of the University and the College of Engineering, is

To be widely recognized for enabling students to have global impact through innovative, quality programs and research that emphasizes collaborative partnerships and the success of a diverse student, faculty, and alumni community.

Fast Track M.S. Program in Computer Science

The Fast Track program is designed to enable TTU undergraduates to accumulate up to seven (7) credit hours of graduate coursework while still pursuing their undergraduate degree and to transition to the Computer Science graduate program smoothly, with accelerated completion.

Up to six (6) hours of graduate coursework, exclusive of directed study, can be used to satisfy both undergraduate and graduate degree requirements. These courses must be taken at Tennessee Tech University and must be approved as appropriate substitutions in the undergraduate curriculum.

The minimum requirements for acceptance to the Fast Track program are:

- Enrolled as TTU Undergraduate with junior or senior standing.
- Completed CSC 2400.
- Overall GPA of at least 3.25 and a GPA for CSC courses of at least 3.5.

Fulfilling the above minimum requirements does not guarantee acceptance into the Computer Science Fast Track program. Students who meet the above minimum requirements must consult with the Computer Science department for eligibility and acceptance.

Once accepted in the Fast Track program, students should be aware of the following:

- Program participants should consult with their future M.S. advisor regarding appropriate graduate courses to take during their junior/senior year.
- The student must earn a minimum grade of "B" in the graduate courses in order to apply them to their M.S. program of study.
- All requirements for full admission to Graduate School must be met upon graduation.
- Students who do not succeed in their first graduate course (B grade or better) will be advised to withdraw from the Fast Track program and complete their B.S. degree in a normal manner.

Departmental Admission Requirements

The minimum requirements for admission to the MS program are the same as those for any MS program in the College of Engineering and are stated under the College of Engineering listing. The program is designed for graduates of approved undergraduate programs. Thus a baccalaureate degree in computer science is required for full standing. Applicants that have an undergraduate degree in a closely related field will be evaluated on a case-by-case basis and may be admitted to full standing upon completion of identified background courses.

For the admission requirements to the Ph.D. program, please refer to the College of Engineering program listing elsewhere in this catalog.

Departmental Degree Requirements

To receive a Master of Science (MS) degree in Computer Science (CS) the student should complete all the MS requirements specified by the University and the College of Engineering. Additionally, certain specific departmental requirements are listed on the corresponding departmental website. A student has the option of a Thesis or Non-Thesis degree program.

Thesis Option

The Thesis option requires 31 semester credit hours of graduate work, including 24 hours of coursework, one hour of graduate seminar (CSC 6910) and 6 hours of graduate thesis (CSC 6990). The thesis requirement includes research, the findings of which must be submitted in writing subject to the policies and satisfaction of the Graduate School and the advisory committee. In addition, each student must pass a defense of his/her research work before the advisory committee. The advisory committee shall consist of at least three members, two of which must be from the CS department, including being chaired or co-chaired by a CS faculty member.

Degree Requirements

- **Core Required Course:** 1 hour
- **Advisor Approved Electives*:** 24 hours
- **Research Requirement:** 6 hours

- **Total Degree Requirements:** 31 hours

* Advisor Approved Electives may be selected from CSC 5000, 6000, 7000 level courses, with a maximum of 9 hours at the 5000 level.

Core Required Course (1 hour)

- CSC 6910 - Computer Science Seminar Cr. 1.

Advisor Approved Electives (24 hours)

Selection of appropriate courses (CSC 5000, 6000, 7000 level, DS 5260, DS 5125, MATH 6170, MATH 6360, or MATH 6700) will be made in consultation with the student's advisory committee and/or the graduate coordinator.

Research Requirement (6 hours)

- CSC 6990 - Research and Thesis Cr. 1,3,6.

Project Option

The Project Option requires 34 semester credit hours of graduate work, including 27 hours of coursework, one hour of graduate seminar (CSC 6910) and 6 hours graduate project (CSC 6980). For the Project Option, each student must pass a defense of her/his project work before the advisory committee. The advisory committee shall consist of at least three members, two of which must be from the CS department, including being chaired or co-chaired by a CS faculty member.

Degree Requirement

- **Core Required Course:** 1 hour
- **Advisor Approved Electives*:** 27 hours
- **Non-Thesis Project Requirement (CSC 6980):** 6 hours
- **Total Degree Requirements:** 34 hours

* Advisor Approved Electives maybe selected from CSC 5000, 6000, 7000 level courses with a maximum of 9 hours at the 5000 level.

Core Required Course (1 hour)

- CSC 6910 - Computer Science Seminar Cr. 1.

Advisor Approved Electives (27 hours)

Selection of appropriate courses (CSC 5000, 6000, 7000 level, DS 5260, DS 5125, MATH 6170, MATH 6360, or MATH 6700) will be made in consultation with the student's advisory committee and/or the graduate coordinator.

Project Requirement (6 hours)

- CSC 6980 - Masters Project Cr. 3.

Courses Only Option

The Courses Only Option requires 34 semester credit hours of graduate work, including 30 hours of coursework, one hour of graduate seminar (CSC 6910) and 3 hours of directed independent study (CSC 6803 or CSC 7980). For the Courses Only Option, each student must pass a comprehensive exam administered by the advisory committee. The advisory committee shall consist of at least three members, two of which must be from the CS department, including being chaired or co-chaired by a CS faculty member.

Degree Requirement

- **Core Required Course:** 1 hour
- **Advisor Approved Electives*:** 30 hours
- **Courses Only Requirement (CSC 6803 or CSC 7980):** 3 hours
- **Total Degree Requirements:** 34 hours

* Advisor Approved Electives maybe selected from CSC 5000, 6000, 7000 level courses with a maximum of 9 hours at the 5000 level.

Core Required Course (1 hour)

- CSC 6910 - Computer Science Seminar Cr. 1.

Advisor Approved Electives (30 hours)

Selection of appropriate courses (CSC 5000, 6000, 7000 level, DS 5260, DS 5125, MATH 6170, MATH 6360, or MATH 6700) will be made in consultation with the student's advisory committee and/or the graduate coordinator.

Courses Only Requirement (3 hours)

- CSC 6803 - Directed Independent Study Cr. 3.
- or
- CSC 7980 - Directed Study Cr. 1-6.

Department of Electrical and Computer Engineering

Electrical and Computer Engineering, M.S.

Departmental Overview

The Department of Electrical and Computer Engineering offers advanced studies leading to the Master of Science degree in Electrical and Computer Engineering and the Doctor of Philosophy degree in Engineering with specialization in Electrical and Computer Engineering. The Ph.D. program is administered by the Associate Dean of Research and Innovation. The goals and the admission and degree requirements for the Ph.D. program are listed under the College of Engineering. The goals of the MS program are to prepare graduates with advanced engineering and research skills and state-of-the-art knowledge in selected areas for positions in industry and for advanced studies towards the Ph.D. The MS-ECE degree program can be pursued with either a thesis option or a non-thesis option.

The departmental faculty have expertise in the following areas of electrical engineering: circuits and signal processing; control, robotics and instrumentation, digital systems, computers, and VLSI circuit design; nuclear engineering; physical phenomenon and lasers; electric power; and telecommunications, wireless communications and networking. Graduate students may carry out their research for their thesis/dissertation in any one (1) of the above areas under the supervision of a faculty member having expertise in that area. Faculty advisors assist graduate students in developing individual programs of study depending on their career goals and thesis/dissertation

research interests. The student's advisory committee assists the student in the development and execution of the program of study and monitors and evaluates the student's work towards the degree.

Many departmental faculty members actively participate in research related to the three Centers of Excellence operated within the University: two within the College of Engineering and one under the Office of Research & Economic Development. The resources and facilities of the Centers greatly enhance the graduate program of the Department.

Fast Track MS Program

The Fast Track program is designed to enable TTU ECE undergraduates to accumulate up to six (6) credit hours of graduate coursework while still pursuing their undergraduate degree and to transition to the graduate program smoothly, with accelerated completion. Up to six (6) hours of graduate coursework, exclusive of directed study, taken during the student's senior year can be used to satisfy both undergraduate and graduate degree requirements. These courses must be taken at Tennessee Tech University and must be approved as appropriate substitutions in the undergraduate curriculum for senior ECE electives. In order to remain in the Fast Track program, the student must demonstrate ongoing scholarship by continuing to meet the GPA admission requirements during the semester that the student enrolls in the first of their graduate courses. The student must earn a minimum grade of "B" in the graduate courses in order to apply them to their M.S. program of study and to continue in the Fast Track program. Additionally, Fast Track students will be integrated into ECE research projects and/or capstone design projects while enrolled as seniors with the expectation that this research will directly coordinate with their M.S. thesis research. Either a thesis or non-thesis M.S. option may be pursued. ECE Fast Track students that graduate with their B.S. in the spring semester can be expected to complete their M.S. requirements in either the spring or summer term of the following calendar year.

Fast Track students are only eligible for graduate teaching or research assistantship during the fifth (graduate) year of their studies. Students who do not succeed in their first graduate course during their senior year (B grade or better) will be advised to withdraw from the Fast Track program and complete their B.S. degree in a normal manner.

Departmental Admission Requirements

The minimum requirements for full standing admission into the MS program are the same as those for any MS program in the College of Engineering and these are stated under the College of Engineering listing. Similarly, the minimum requirements for full standing admission into the Ph.D. program with a major in ECE are the same as those for the Ph.D. program listed in the College of Engineering section. Applicants with impressive academic performance or publication record may be admitted on full standing status even if their GRE(R) General Test (GRE) and/or TOEFL scores do not meet the minimum requirements. The Departmental Admissions Committee evaluates each application individually for potential to succeed in the graduate program and makes an admission recommendation. Students who do not meet the minimum admission requirements or whose potential for success is not evident from the application may be considered for provisional admission. These students will be reclassified to full standing admission once they satisfy the conditions specified in the admission letter. Students with good academic background but having BS degrees in fields other than electrical engineering will be admitted on a provisional basis. They will be required to complete satisfactorily a specified set of undergraduate electrical and computer engineering courses before they are reclassified to full standing.

Departmental Degree Requirements for Doctor of Philosophy

To receive a Ph.D. degree with specialization in ECE, the student shall complete all the requirements for the Ph.D. specified under the College of Engineering section of the catalog.

Additionally, the program of study for Ph.D. students majoring in ECE shall include ECE 6910 - Introduction to Graduate Research during the first semester of study except when the student has already taken ECE 6910 as a part of the MS program or when the student has prior research experience as demonstrated by the successful completion of a master's thesis; and no more than nine hours of independent/directed study courses such as ECE 6980/ECE 7980. The ECE departmental chairperson will assist the Associate Dean in deciding the appropriateness of each program of study.

The student's advisory committee must be chaired or co-chaired by an ECE faculty member, and additionally, the committee must include at least two members of the ECE faculty, a member from the engineering faculty outside the ECE Department and one member from the Mathematics Department. The Associate Dean for Research and Innovation is an ex-officio nonvoting member of every Ph.D. student's advisory committee.

Departmental Degree Requirements

To receive an MS degree in ECE the student should complete all the MS requirements specified by the University and the College of Engineering. Additionally, certain departmental requirements listed below shall also be satisfied:

Thesis Option

An MS-ECE program of study with thesis option requires a minimum of 24 credit hours of course work and a minimum of six (6) credit hours of thesis completed under the supervision of the graduate thesis advisor. The coursework shall include: ECE 6910 - Introduction to Graduate Research, during the first semester of study; at least 15 hours of graduate ECE courses that must include 9 credit hours of ECE graduate level breadth courses from a list maintained by the ECE Department; no more than six (6) hours of directed/independent study courses to satisfy the required minimum of 24 hours of coursework. The thesis requirement includes research, the findings of which must be submitted in writing subject to the policies and satisfaction of the College of Graduate Studies and the advisory committee. In addition, each student must pass a comprehensive exam which includes a defense of his/her research work before the advisory committee. The advisory committee shall be chaired or co-chaired by an ECE faculty member and include an additional member from the ECE Department.

Degree Requirements

- **Core Required Course, ECE 6910:** 1 hour
- **ECE Breadth Courses*:** 9 hours
- **Advisor Approved Electives (directed/independent study)*:** 6 hours
- **Advisor Approved Electives*:** 8 hours
- **Research and Thesis, ECE 6990:** 6 hours
- **Total Degree Requirements:** 30 hours

*Selection of appropriate courses (ECE 5000, 6000, 7000 level) will be made in consultation with the student's advisory committee and/or the graduate coordinator.

Advisor Approved Electives

Advisor Approved Electives (within the department)

Selection of appropriate courses (ECE 5000, 6000, 7000 level) will be made in consultation with the student's advisory committee and/or the graduate coordinator.

Advisor Approved Electives (outside of the department)

The student's advisory committee and/or the graduate coordinator may advise a student to take courses outside of the ECE discipline. Common prefixes appropriate for the ECE program of study include: ME, MATH, CSC, CHEM, CHE, PHYS, and CEE.

Non-thesis Option

An MS-ECE program of study with non-thesis option requires a minimum of 34 credit hours of course work and shall include: ECE 6910 - Introduction to Graduate Research, during the first semester of study; 9 credit hours of graduate level breadth courses from a list maintained by the ECE department; a minimum of twelve (12) credit hours of graduate level ECE elective courses; a three (3) credit hours ECE 6970 - Non-Thesis Design Project course that will enhance independent learning skills and a maximum of nine (9) hours of graduate level elective courses from outside the department.

- **Core Required Course, ECE 6910:** 1 hour
- **ECE Breadth Courses*:** 9 hours
- **Advisor Approved Electives*:** 12 hours
- **Advisor Approved Electives*:** 9 hours
- **Non-Thesis Design Project, ECE 6970:** 3 hours
- **Total Degree Requirements:** 34 hours

*Selection of appropriate courses (ECE 5000, 6000, 7000 level) will be made in consultation with the student's advisory committee and/or the graduate coordinator.

Advisor Approved Electives

Advisor Approved Electives (within the department)

Selection of appropriate courses (ECE 5000, 6000, 7000 level) will be made in consultation with the student's advisory committee and/or the graduate coordinator.

Advisor Approved Electives (outside of the department)

The student's advisory committee and/or the graduate coordinator may advise a student to take courses outside of the ECE discipline. Common prefixes appropriate for the ECE program of study include: ME, MATH, CSC, CHEM, CHE, PHYS, and CEE.

Department of General and Basic Engineering

Engineering Management, M.S.

Engineering Management Program Information

Degree Requirements

The Master of Science in Engineering Management is a 33 hour program. Students will complete a business core of courses and engineering core as follows:

- **Core Business Courses:** 12 hours
- **Core Engineering Courses:** 21 hours
- **Total Degree Requirements:** 33 hours

Core Business Courses (12 hours)

- ACCT 6010 - Accounting Information for Management Decisions Cr. 3.
- BMGT 6200 - Organizational Leadership Cr. 3.
- FIN 6020 - Financial Management Cr. 3.
- MKT 6100 - Strategic Marketing Cr. 3.

Core Engineering Courses (21 hours)

- EMGT 6100 - Introduction to Engineering Management Cr. 3.
- EMGT 6210 - Project Management 1 Cr. 3.
- EMGT 6220 - Project Management 2 Cr. 3.
- EMGT 6230 - Project Management 3 Cr. 3.
- EMGT 6300 - Decision Analysis Cr. 3.
- EMGT 6900 - Professional Project Cr. 3.
- ENGR 6200 - Statistical Inference for Engineers Cr. 3.

Department of Mechanical Engineering

Mechanical Engineering, M.S.

Mohan Rao, Chairperson

Departmental Graduate Faculty: Mohammad Albarkri, Steven Anton, Daniel W. Brookshear, Stephen L. Canfield, Jennifer Charlton, Pingren Chen, Jie Cui, Glenn Cunningham, Brian Damiano, Stephen A. Idem, Ethan Languri, Byron Pardue, Sally Pardue, Mohan Rao, Rory Roberts, Arman Sargolzaei, Joseph Slanter, Kwun-lon Ting, Ahmad Vasselbehagh, Christopher D. Wilson, Dale Wilson, Ying Zhang, Jiahong (John) Zhu

Departmental Admissions Requirements

Master's Degree

An applicant for admission to the MS in Mechanical Engineering is expected to have earned a BS degree from an approved program, or its equivalent. Admission is decided based on a multi-parameter criterion that can include the following items to be evaluated by the department:

- undergraduate GPA of at least 3.0 on a 4.0 scale,
- GRE® General Test (GRE) scores with Quantitative greater than or equal to 50%; Verbal greater than or equal to 33%; Analytical Writing greater than or equal to 33%. Students with BS degrees in related fields from TTU are not required to take the GRE.
- Three (3) letters of recommendation that demonstrate strong evidence for success in the graduate program.
- Availability of appropriate faculty to serve as research advisor(s).
- Participation in undergraduate research.
- Post-BS degree professional experience relevant to planned degree of study.
- Publications in peer reviewed journals and/or award-winning presentations in technical conferences.
- International students must score at least 550 (213 computer-based or 79 internet-based) on the TOEFL or a minimum base score of 6.0 on the IELTS.

Based on the level of satisfaction of the above criterion, the department will either recommend admission to Full Standing, Provisional Standing, or Special Standing, or deny admission. Standing status may be changed to Full Standing after the student satisfies the requirements specified by the department at the time of admission.

The ME Department has a Departmental Admissions Committee who reviews and evaluates each application individually for unique merits and for the applicant's potential success in the graduate program and makes admission recommendation to the appropriate administrator. Students who do not meet the minimum admission requirements or whose potential for success is not evident from the application may be considered for provisional standing. These

students will be reclassified to full standing once they satisfy the conditions specified in the provisional admission statement. Occasionally, highly qualified students not having their BS degree in mechanical engineering may be admitted on a provisional basis with the stipulation of satisfactorily completing a specified set of undergraduate courses before achieving full standing. If admitted in provisional standing at master's level, the student must remove all deficiencies and apply for reclassification to full standing prior to the completion of 15 graduate hours.

Departmental Overview

The Mechanical Engineering Department offers courses and research projects leading to the Master of Science Degree in Mechanical Engineering and enthusiastically participates in the Doctor of Philosophy Degree offered in the College for those doctoral students focusing their work in the mechanical engineering area. The MS program is administered by the Department and the Ph.D. program is administered by the Associate Dean of Engineering for Graduate Studies and Research. Both degrees are research-oriented.

Participation in graduate education is consistent with the Mechanical Engineering Department's goals and objectives which are:

- to provide quality instructional programs and research experiences in mechanical engineering subjects that are at a level of sophistication compatible with professional norms;
- to maintain a competent, dynamic faculty, expert in the various facets of mechanical engineering that strive to motivate the student and that practices effective educational techniques;
- and to provide instructional and research facilities, equipped with up-to-date apparatus, which are conducive to the education of mechanical engineering graduate students.

A graduate student may customize his/her graduate courses in one of several areas subject to the approval of his/her graduate advisory committee. Areas of specialty include energy systems (including alternate and renewable), robotics and intelligent systems, solid mechanics and materials, thermal fluid science, vehicle systems (including hybrid and autonomous), vibrations/acoustics/dynamics and control, and advanced manufacturing. Graduate course offerings are offered each semester to meet the needs of the graduate students. Graduate students may carry out their research for their thesis/dissertation in any one of the aforementioned areas under the supervision of a faculty member, having expertise in that area, who is also a member of the graduate faculty. Individual programs of study are developed for each student depending on his/her career goals and thesis research interest. Thesis, non-thesis and on-line non-thesis programs are offered to meet the needs of our students.

Faculty advisors assist graduate students in the development of their individual programs of study depending on their career goals and thesis/dissertation interests. The advisor chairs the student's advisory committee. The student's advisory committee guides the student through degree progression and is responsible for monitoring the student's work to complete the degree requirement.

The research and graduate education within the College are enhanced by four Centers of Excellence: the Center for Energy Systems Research (CESR); the Center for Manufacturing Research (CMR); Cybersecurity Education, Research and Outreach Center (CEROC); and the Center for the Management, Utilization, and Protection of Water Resources (WC). The Mechanical Engineering Department is highly involved with the first two. Faculty actively interact with the Power and Manufacturing Centers in seeking external funding for research. The Centers complement the faculty efforts by supporting graduate students and via administrative support. The interaction involves a strengthening through sharing of resources and personnel.

Mechanical Engineering Program Information

Departmental Degree Requirements

The graduate program in the Mechanical Engineering Department offers a thesis, non-thesis, and fully on-line non-thesis option to meet the needs of the student.

Master of Science with Thesis Option

An MS program of study with thesis option requires a minimum of 22 credit hours of graduate course work (24 credit hour maximum), as specified in the student's approved Program of Study, and either six (6) or eight (8) hours of thesis credit, for a total of 30 credit hours, completed under the supervision of the graduate thesis advisor. No more than nine (9) credit hours of the 22 credit hour total may be at the 5000-level. A minimum GPA of 3.0 is required both to graduate and to remain in good standing in the program. The thesis requirement includes research, the findings of which must be submitted in writing and are subject to the policies and satisfaction of the Graduate School Office and the advisory committee. In addition, each student must pass a comprehensive exam which includes a defense of his/her research work before the advisory committee and submit the defense results to the College of Graduate Studies.

- **Advisor Approved Electives***, including **ME 6910 (1 credit hour)**: 22-24 hours
- **Research and Thesis, ME 6990**: 6-8 hours
- **Total Degree Requirements**: 30 hours

* Selection of appropriate courses (ME, CSC, ECE, MATH 5000, 6000, 7000 level) will be made in consultation with the student's advisory committee and/or the graduate coordinator.

Master of Science with On-line Non-Thesis Option

An MS program of study with non-thesis option requires a minimum of 33 credit hours of graduate course work, as specified in the student's approved program of study. This program is offered on-line. The program of study shall include 30 semester hours of formal, graded coursework, and three (3) semester hours of ME 6960 - Non-Thesis Project. At least seventy percent of the credit to be counted toward the MS degree (21 hours) must be at the 6000 level or above. The Non-Thesis project course will demonstrate the student's capability to engage in independent learning. The content and format of the special topics course, including the comprehensive examination, will be entirely at the discretion of the student's advisory committee. Typically the special topics course will be taken in the final semester listed on the program of study.

- **Advisor Approved Electives***: 30 hours
- **Non-Thesis Project, ME 6960**: 3 hours
- **Total Degree Requirements**: 33 hours

*Selection of appropriate courses (ME, ECE, CSC, MATH 5000, 6000, 7000 level) will be made in consultation with the student's advisory committee and/or the graduate coordinator.

Department of Manufacturing and Engineering Technology Information

Manufacturing and Engineering Technology provides you with STEM knowledge to work with engineers, scientists and managers on a plan while taking part in a project with the skills of a technologist or applied engineer.

Departmental Mission:

To graduate innovative Engineering Technologists and Applied Engineers who solve technological challenges to meet societal needs.

The department is accredited by the Accreditation Board of Engineering and Technology (ABET), which sets standards for academic program accreditation, personal certification, and professional development for educators and industry professionals involved in integrating technology, leadership and design.

The department does not offer a graduate degree at this time.

College of Fine Arts

Jennifer Shank, Ph.D., Dean

No graduate degree programs are offered from the College of Fine Arts.

Department of Music

Departmental Graduate Faculty: Wei Tsun Chang, Jeremy Hansen, Eric Harris, Colin Hill, Chris McCormick, Jeff Miller, R. Winston Morris, Marco Shirripa, Judith Sullivan, Jennifer Shank, Craig Zamer,

No degree is offered in Music but courses may be used (with advisory committee approval) as electives in other fields of study.

Department of Art, Craft & Design

Kimberly Winkle, Director

Departmental Graduate Faculty:

No degree is offered in Art but courses may be used (with advisory committee approval) as electives in other fields of study.

Department and Program Information

College of Interdisciplinary Studies

Dr. Mike Gotcher, Dean

Schools and Program Information

Environmental Sciences Program Information

Admission Requirements

Applicants who do not fully meet the following requirements may be admitted in Provisional Standing on the basis of a favorable recommendation to the Associate Dean of Graduate Studies by the appropriate departmental chairperson and the Director of the Environmental Sciences doctoral program. If admitted in Provisional Standing, the student must remove all deficiencies and apply for reclassification to Full Standing prior to the completion of 15 hours of graduate work.

Application materials may be obtained from the Graduate School Office.

Applicants for admission to the doctoral program in Environmental Sciences must have:

- a bachelor's or master's degree in science, mathematics, engineering, or environmental science;
- a grade point average of 3.0 or above on a 4.0 scale;
- international students must have a score of 525 or above on the TOEFL;
- and GRE score of at least 300 (Quantitative + Verbal) and 3.5 (Analytical Writing) for students entering any concentration within the Environmental Sciences Ph.D. degree program.

Applicants seeking admission with Full Standing in the program must satisfy the departmental requirements.

Guidelines for Committee and Comprehensive Exam

Guidelines for Graduate Committee Composition

The organization and appointment of advisory committees to supervise graduate study for the degree of Doctor of Philosophy in Environmental Sciences shall be the same, generally, as in the master's program, except that the advisory committee shall consist of at least five (5) members of the Graduate Faculty, plus the Director of Environmental Sciences Ph.D. program who serves as an ex officio, nonvoting member. Three (3) members shall be from the student's area of concentration, either Biology or Chemistry. Two (2) members shall be from separate departments of the environmental science core outside the student's area of concentration. Changes in a Ph.D. advisory committee must adhere to all policies and procedures governing graduate study at the University, as contained in the Graduate Catalog and administered by the Director of Graduate Studies.

Guidelines for the Comprehensive Examination

Prerequisites. Before requesting that his or her major professor schedule a Comprehensive Examination, a student must:

- have achieved Full Standing in the program
- completed approximately 80% of the course work in his/her Program of Study

Descriptions

The test will consist of written and/or oral portions. The student's advisory portion will consist of four (4) sections. Total time for each section should not exceed eight (8) hours. Three (3) sections will contain material from the student's area of concentration and one (1) section will integrate material from the Environmental Sciences Core Curriculum.

If an oral exam is to be included as part of the comprehensive exam it will be administered by the student's advisory committee within three (3) weeks of the successful completion of the written portion of the exam. A question will be included in the oral exam that tests the student's understanding of the interdisciplinary nature of Environmental Sciences.

If an oral exam is included as part of the comprehensive exam, both portions of the Comprehensive Examination will be completed during one (1) academic semester.

Results

Four-fifths of the voting members of the committee must agree that the student has successfully completed the comprehensive exam.

The student will be given one (1) additional opportunity to pass each portion of the Comprehensive Examination. Failure to pass either portion on the second try will result in the student's dismissal from the Ph.D. program.

A written evaluation of the student's performance on the Comprehensive Examination will be prepared by the student's advisory committee and kept on file in the office of the Director of the Environmental Sciences Ph.D. program.

Time Constraints

Successful completion of the Comprehensive Examination must be achieved in a timely fashion. The complete Comprehensive Examination must be scheduled and taken within a year following the completion of 80% of the course work in the student's Program of Study, including successful completion of all core courses. It shall be the student's responsibility, in consultation with his/her advisor, to schedule this examination at a date agreeable to the whole examining committee. The committee shall be given at least two (2) months advance notice of the Examination date in order to make preparations. Any second attempts to pass portions of the Comprehensive Examination must be scheduled in the subsequent (Fall/Spring) semester. Failure to follow these procedures shall result in the student's dismissal from the program. Any appeal by the student for exceptions to this policy shall be made in writing and submitted to the Executive Committee of the Ph.D. program.

Doctor of Philosophy

Environmental Sciences, Ph.D.

The Doctor of Philosophy degree program in Environmental Sciences offers concentrations in biology, chemistry, agriculture, geosciences, and integrated research but emphasizes the solution of complex environmental problems using an interdisciplinary approach. Course work is required in biology, chemistry, geology, agriculture, and sociology. This interdisciplinary approach insures that students become aware of a wide range of environmental concerns and that their research includes a breadth of environmental understanding beyond the boundaries of a particular discipline. The goal of the program is to prepare students for careers in research, management, government service, teaching, and other areas where they can make productive contributions to the solution of environmental problems.

The program of study for a doctoral degree requires a minimum of 61 semester credits beyond the bachelor's level, including 13 credits in "core courses," 12 credits at the 7000 level, and at least 18 credits in doctoral research and dissertation. Graduate assistantships are available.

Environmental Sciences, Agriculture Concentration, Ph.D.

Environmental Sciences Program Information

Agriculture has many connections with Environmental Sciences, including study areas of sustainable and organic farming, applications of technology and engineering, and effects of pesticides and fertilizers on plants, animals, and ecosystems, to name a few. Tennessee Tech has the Shipley Farm and other operations that provide a venue for dissertation research projects in Environmental Agriculture and the faculty in the School of Agriculture offer coursework and advise graduate students in this area.

Degree Requirements

The general requirements for the Ph.D. degree in Environmental Sciences are:

- **Concentration Core Coursework:** 13 hours
- **Research and Dissertation Requirement:** 18 hours
- **Advisor Guided Concentration Coursework:** 30 hours
- **Total Degree Requirement:** 61 hours

- A minimum of 61 semester credits of course work and doctoral research and dissertation as follows:
 - A minimum of 43 semester credits of course work beyond the bachelor's degree:
 - This must include 13 semester credits of core coursework
 - This must include 30 hours of concentration coursework
 - Must include at least 12 semester credits at the 7000 level
 - A minimum of 18 semester credits of research and dissertation, resulting in the satisfactory completion of a doctoral dissertation.
- Residence of four (4) semesters beyond the bachelor's level, with at least two (2) semesters in continuous residence.
- Completion of all requirements for the degree, including the dissertation within a period of eight (8) consecutive years.
- Maintenance of a general grade point average of 3.0.
- Satisfactory completion of a comprehensive examination.
- Satisfactory presentation and defense of a doctoral dissertation.

In addition, a student must adhere to all policies and procedures governing graduate study at the University, as contained in the Graduate Catalog and administered by the Director of Graduate Studies.

Concentration Core Coursework (13 hours)

- EVSB 6010 - Environmental Biology Cr. 3.
- EVSG 6010 - Environmental Geology Cr. 3.
- EVSS 6010 - Environmental Social Policy Cr. 3.
- EVSC 6010 - Environmental Chemistry Cr. 3.
- EVS 7910 - Environmental Science Seminar Cr. 1.

Research and Dissertation Requirement (18 hours)

- EVSA 7990 - Research and Dissertation Cr. 1-9.

Advisor Guided Concentration Coursework (30 hours)

The advisor and/or committee may define 30 hours from any EVSA, EVSB, EVSC, EVSI, EVSS, EVS, BIOL, or CHEM 6000-7000 level courses.

Course Substitutions

Course Substitutions are allowed upon approval of the graduate advisory committee, department chair/director, and dean of the college.

Environmental Sciences, Biology Concentration, Ph.D.

Dr. Hayden Mattingly, Director

Environmental Sciences Program Information

EVS Biology Concentration Additional Admissions Requirement

Degree Requirements

The general requirements for the Ph.D. degree in Environmental Sciences are:

- **Concentration Core Coursework:** 13 hours
- **Research and Dissertation Requirement:** 18 hours
- **Advisor Guided Concentration Coursework:** 30 hours
- **Total Degree Requirement:** 61 hours
- A minimum of 61 semester credits of course work and doctoral research and dissertation as follows:
 - A minimum of 43 semester credits of course work beyond the bachelor's degree:
 - This must include 13 semester credits of core coursework
 - This must include 30 hours of concentration coursework
 - Must include at least 12 semester credits at the 7000 level
 - A minimum of 18 semester credits of research and dissertation, resulting in the satisfactory completion of a doctoral dissertation.

- Residence of four (4) semesters beyond the bachelor's level, with at least two (2) semesters in continuous residence.
- Completion of all requirements for the degree, including the dissertation within a period of eight (8) consecutive years.
- Maintenance of a general grade point average of 3.0.
- Satisfactory completion of a comprehensive examination.
- Satisfactory presentation and defense of a doctoral dissertation.

In addition, a student must adhere to all policies and procedures governing graduate study at the University, as contained in the Graduate Catalog and administered by the Director of Graduate Studies.

EVS Biology Concentration Additional Admissions Requirement

- applicants must have a bachelor's or master's degree in a biological science
- a grade point average of 3.5 or above for the highest degree earned
- In addition, a graduate faculty member must have agreed to direct the student's doctoral program and financial support must have been identified for a stipend and for research needs.

Concentration Core Coursework (13 hours)

- EVSA 6010 - Environmental Agriculture Cr. 3.
- EVSG 6010 - Environmental Geology Cr. 3.
- EVSS 6010 - Environmental Social Policy Cr. 3.
- EVSC 6010 - Environmental Chemistry Cr. 3.
- EVS 7910 - Environmental Science Seminar Cr. 1.

Research and Dissertation (18 hours)

- EVSB 7990 - Research and Dissertation Cr. 1-9.

Advisor Guided Concentration Coursework (30 hours)

The advisor and/or committee may define 30 hours from any EVSA, EVSB, EVSC, EVSI, EVSS, EVS, BIOL, or CHEM 6000-7000 level courses.

Course Substitutions

Course Substitutions are allowed upon approval of the graduate advisory committee, department chair/director, and dean of the college.

Environmental Sciences, Chemistry Concentration, Ph.D.

Dr. Hayden Mattingly, Director

Environmental Sciences Program Information

EVS Chemistry Concentration Additional Admissions Requirements

Degree Requirements

The general requirements for the Ph.D. degree in Environmental Sciences are:

- **Concentration Core Coursework:** 13 hours
- **Research and Dissertation Requirement:** 18 hours
- **Advisor Guided Concentration Coursework:** 30 hours
- **Total Degree Requirement:** 61 hours

- A minimum of 61 semester credits of course work and doctoral research and dissertation as follows:
 - A minimum of 43 semester credits of course work beyond the bachelor's degree:
 - This must include 13 semester credits of core coursework
 - This must include 30 hours of concentration coursework
 - Must include at least 12 semester credits at the 7000 level
 - A minimum of 18 semester credits of research and dissertation, resulting in the satisfactory completion of a doctoral dissertation.
- Residence of four (4) semesters beyond the bachelor's level, with at least two (2) semesters in continuous residence.
- Completion of all requirements for the degree, including the dissertation within a period of eight (8) consecutive years.
- Maintenance of a general grade point average of 3.0.
- Satisfactory completion of a comprehensive examination.
- Satisfactory presentation and defense of a doctoral dissertation.

In addition, a student must adhere to all policies and procedures governing graduate study at the University, as contained in the Graduate Catalog and administered by the Director of Graduate Studies.

EVS Chemistry Concentration Additional Admissions Requirements

- applicants must have a bachelor's degree in chemistry that has been certified by the American Chemical Society or course work equivalent to this degree;
- applicants must have one (1) year each of general, organic, and physical chemistry;
- applicants must have one (1) semester of analytical and inorganic chemistry, one (1) semester of instrumental analysis.

Applicants who do not fully meet the above requirements may be admitted in Provisional Standing on the basis of a favorable recommendation to the Associate Dean of Graduate Studies by the appropriate departmental chairperson and the Director of the Environmental Sciences doctoral program. If admitted in Provisional Standing, the student must remove all deficiencies and apply for reclassification to Full Standing prior to the completion of 15 hours of graduate work.

Concentration Core Coursework (13 hours)

- EVSA 6010 - Environmental Agriculture Cr. 3.
- EVSG 6010 - Environmental Geology Cr. 3.
- EVSS 6010 - Environmental Social Policy Cr. 3.
- EVSB 6010 - Environmental Biology Cr. 3.
- EVS 7910 - Environmental Science Seminar Cr. 1.

Research and Dissertation Requirement (18 hours)

- EVSC 7990 - Research and Dissertation Cr. 1-9.

Advisor Guided Concentration Coursework (30 hours)

The advisor and/or committee may define 30 hours from any EVSA, EVSB, EVSC, EVSI, EVSS, EVS, BIOL, or CHEM 6000-7000 level courses.

Course Substitutions

Course Substitutions are allowed upon approval of the graduate advisory committee, department chair/director, and dean of the college.

Environmental Sciences, Geosciences Concentration, Ph.D.

Environmental Sciences Program Information

Geosciences has many connections with Environmental Sciences, including study areas of climate change, depletion of sand, soils, and other terrestrial resources, hydrology and groundwater contamination, fracking and other oil/gas/coal exploration, geographic patterns in land use, geospatial analyses and remote sensing, just to name a few. Tennessee Tech has existing laboratory space to provide a venue for dissertation research projects in environmental geology, geography, and related earth sciences topic areas.

Degree Requirements

The general requirements for the Ph.D. degree in Environmental Sciences are:

- **Concentration Core Coursework:** 13 hours
- **Research and Dissertation Requirement:** 18 hours
- **Advisor Guided Concentration Coursework:** 30 hours
- **Total Degree Requirement:** 61 hours

- A minimum of 61 semester credits of course work and doctoral research and dissertation as follows:
 - A minimum of 43 semester credits of course work beyond the bachelor's degree:
 - This must include 13 semester credits of core coursework
 - This must include 30 hours of concentration coursework
 - Must include at least 12 semester credits at the 7000 level
 - A minimum of 18 semester credits of research and dissertation, resulting in the satisfactory completion of a doctoral dissertation.
- Residence of four (4) semesters beyond the bachelor's level, with at least two (2) semesters in continuous residence.
- Completion of all requirements for the degree, including the dissertation within a period of eight (8) consecutive years.
- Maintenance of a general grade point average of 3.0.
- Satisfactory completion of a comprehensive examination.
- Satisfactory presentation and defense of a doctoral dissertation.

In addition, a student must adhere to all policies and procedures governing graduate study at the University, as contained in the Graduate Catalog and administered by the Director of Graduate Studies.

Concentration Core Coursework (13 hours)

- EVSA 6010 - Environmental Agriculture Cr. 3.
- EVSB 6010 - Environmental Biology Cr. 3.
- EVSS 6010 - Environmental Social Policy Cr. 3.
- EVSC 6010 - Environmental Chemistry Cr. 3.

- EVS 7910 - Environmental Science Seminar Cr. 1.

Research and Dissertation Requirement (18 hours)

- EVSG 7990 - Research and Dissertation Cr. 1-9.

Advisor Guided Concentration Coursework (30 hours)

The advisor and/or committee may define 30 hours from any EVSA, EVSB, EVSC, EVSI, EVSS, EVS, BIOL, or CHEM 6000-7000 level courses.

Course Substitutions

Course Substitutions are allowed upon approval of the graduate advisory committee, department chair/director, and dean of the college.

Environmental Sciences, Integrated Research, Ph.D.

Environmental Sciences Program Information

Advances in the field of Environmental Sciences are often dependent on collaboration and interdisciplinary research to answer difficult questions in the environmental arena. Integrating expertise from other fields such as engineering, education, mathematics, sociology and political science, computer sciences, nursing, economics, history, philosophy and ethics, among others, can provide a powerful platform for addressing problems in the environmental sciences in a more effective manner.

Degree Requirements

The general requirements for the Ph.D. degree in Environmental Sciences are:

- **Concentration Core Coursework:** 13 hours
- **Research and Dissertation Requirement:** 18 hours
- **Advisor Guided Concentration Coursework:** 30 hours
- **Total Degree Requirement:** 61 hours
- A minimum of 61 semester credits of course work and doctoral research and dissertation as follows:
 - A minimum of 43 semester credits of course work beyond the bachelor's degree:
 - This must include 13 semester credits of core coursework
 - This must include 30 hours of concentration coursework
 - Must include at least 12 semester credits at the 7000 level
 - A minimum of 18 semester credits of research and dissertation, resulting in the satisfactory completion of a doctoral dissertation.
- Residence of four (4) semesters beyond the bachelor's level, with at least two (2) semesters in continuous residence.
- Completion of all requirements for the degree, including the dissertation within a period of eight (8) consecutive years.
- Maintenance of a general grade point average of 3.0.
- Satisfactory completion of a comprehensive examination.
- Satisfactory presentation and defense of a doctoral dissertation.

In addition, a student must adhere to all policies and procedures governing graduate study at the University, as contained in the Graduate Catalog and administered by the Director of Graduate Studies.

Concentration Core Coursework (13 hours)

- EVS 7910 - Environmental Science Seminar Cr. 1.
Choose any 4 of the 6010 courses listed below:
- EVSA 6010 - Environmental Agriculture Cr. 3.
- EVSG 6010 - Environmental Geology Cr. 3.
- EVSS 6010 - Environmental Social Policy Cr. 3.
- EVSC 6010 - Environmental Chemistry Cr. 3.
- EVSB 6010 - Environmental Biology Cr. 3.

Research and Dissertation Requirement (18 hours)

- EVSI 7990 - Research and Dissertation Cr. 1-9.

Advisor Guided Concentration Coursework (30 hours)

The advisor and/or committee may define 30 hours from any EVSA, EVSB, EVSC, EVSI, EVSS, EVS, BIOL, or CHEM 6000-7000 level courses.

Course Substitutions

Course Substitutions are allowed upon approval of the graduate advisory committee, department chair/director, and dean of the college.

Master of Professional Studies

The Master of Professional Studies (MPS) is designed to affordably and flexibly meet the needs of working adults who are not generally served by traditional methods. This unique program is taught by professors who are best suited to help you develop the skills necessary to excel in your career field and this program is offered completely online and available 24/7.

Master of Professional Studies Website

Overview

The Master of Professional Studies (MPS) – This graduate professional studies degree consists of 30 hours of interdisciplinary coursework. This degree is available in several concentration areas and offers students the chance to complete a graduate certificate within each of the concentration areas: Healthcare Administration—provides the healthcare professional with leadership and strategic management tools to lead and serve one of the nation's largest service industries. The focus of the program is to provide the healthcare professional with the opportunity to develop important skills in healthcare, leadership, finance, informatics, research and administration in the various components of healthcare delivery systems that include hospitals, nursing homes, group medical practices, personal care homes, retirement centers, health maintenance organizations, medical sales, and insurance companies. A graduate certificate is available in Healthcare Informatics for the Healthcare Administration students.

Human Resources Leadership — prepares you for a leadership role in the area of human resources. The interdisciplinary approach is appropriate because of the many skills and knowledge areas that are needed for success in this field.

Public Safety — provides the public safety professional with leadership and strategic management tools to lead and serve in one of the nations growing professions.

Strategic Leadership — prepares you to lead in today's rapidly changing professional environment. The interdisciplinary approach focuses on the areas of leadership, communication, strategic planning and assessment, organizational structure and research/data analysis.

Teaching English to Speakers of Other Languages (TESOL) — prepares you to meet an ongoing demand for both initial preparation and continuing education for individuals who plan to teach or a currently teaching English as a second/foreign language in various educational settings.

Training and Development — equips leaders for the growing and evolving field of workplace learning and performance. The program will prepare you to manage, deliver and assess on-site performance-based training, instructional design, and address the needs of human resource managers and other professionals who are increasingly relying on technology to deliver workforce education.

Corporate Communication — prepares you to excel in the fast-paced professional environment that surrounds the communication field. This program strengthens the corporate leader in developing organizational and interpersonal communication skills and leadership skills.

Media and Strategic Communication — prepares you to lead in the exciting field are of media and communication. The professional will acquire skills in the area of event planning and promotion, public relations, marketing, and other key communication areas.

In addition, the MPS program offers a 15 hour Graduate Certificate within each concentration area allowing students to achieve an additional milestone en route to their degree.

Admission Requirements

For Full Standing

The minimum admission requirements are:

1. A bachelor's degree from an accredited institution
2. Satisfactory undergraduate grade point average, a minimum of 2.5 on a 4.0 scale

And, applicants must meet **one** of the following conditions:

1. 3.0 grade point average in their undergraduate major course of study
2. A score of 146 on the verbal portion of the GRE® General Test (GRE) and 144 quantitative portion.
3. A combined score of 290 on the verbal and quantitative reasoning sections and a 3.5 on analytical writing.
4. Five (5) or more years of professional work experience demonstrated through a portfolio. The portfolio is to include:
 - a resume;
 - a 500- to 600-word essay detailing the reasons for wanting to enter the MPS program and discussing how the program will help the applicant achieve personal and professional goals; and
 - two (2) sealed letters of professional reference.
 - Other items that an applicant may include in the portfolio include a description of professional responsibilities, professional achievements and professional awards/recognition's. The portfolio material must be submitted as a packet, not mailed separately.

International students must meet English language proficiency requirements by providing a TOEFL score. Minimum IBT of 71 or an approved equivalent exam and equivalent scores. International applicants with an IBT below 79 must complete 6 hours of grammar/reading/communication course work. The 6 hours are in addition to the 30 hours required for the Master's degree.

Satisfying minimal standards, however, does not guarantee your admission. Admission decisions are based on departmental review, using a combination of factors including an interview to evaluate dispositions for professionals in the chosen concentration.

Students may be admitted with provisional status if they do not meet all of the criteria above but do meet the minimum requirements of the graduate school and are approved for provisional status by the departmental admissions committee. Provisional status will limit students to a maximum of 9 hours before the departmental admissions committee makes a recommendation for full admission. To advance from provisional to full admission a student must earn a 3.0 GPA on the 9 hours of graduate study in the concentration and be approved by the departmental admissions committee.

Note: All international students who attend TTU, who are enrolled on the Department of Homeland Securities F-1 or J-1 visa status must complete all midterm and final exams in a proctored setting on the Tennessee Tech University campus in Cookeville, TN.

MPS Fast-track Program Admissions

The MPS Fast-track program will allow eligible undergraduates to enroll for up to six (6) hours of graduate courses prior to formal admission to the MPS program. The courses will be taken during the student's junior/senior year and can be used to satisfy both undergraduate and graduate degree requirements. Participation does not change requirements for either the undergraduate or graduate programs of study. The MPS Fast-track program applies to all MPS concentrations.

Once admitted to the MPS Fast-track program, the student will be allowed to enroll in appropriate graduate courses in the junior or senior year with the consent of the student's undergraduate advisor and the Director of the MPS program. Courses completed at the Graduate Level are only guaranteed to apply to the completion of the MPS graduate degree program. The student must earn a minimum grade of "B" in the graduate courses in order to apply them to the MPS program of study and to continue in the Fast-track program. The MPS Fast-track program is open to all undergraduate majors whom meet the following admissions requirements:

- Fast-track applicant must be earning a baccalaureate degree at TTU and completed at least 90 hours of credit;
- Overall undergraduate GPA of 3.0 or better;
- GPA of 3.25 in undergraduate major;
- Recommendation from the student's undergraduate advisor

Note: in addition to the requirements for admission to the MPS Fast-track program, all requirements for admission to the graduate program must also be met upon graduation. Meeting these minimum requirements does not guarantee admission to the graduate program.

Full Time Status Defined for Accelerated Courses

For a graduate student to be considered full-time they must be enrolled in nine credit hours for the semester (excluding Graduate Assistants who may enroll in 6 hours). The Public Safety program includes an accelerated course schedule with classes available in five and seven week formats, thus the combination of the accelerated courses over the entire semester should equal nine credit hours for a student to be considered full-time.

Graduate Certificates

Students seeking a Graduate Certificate will go through the graduate application process as if they were seeking an MPS degree, meeting all admissions requirements as set forth in the degree program. Once admitted, students are considered MPS degree seeking students and will be working towards completing the pre-defined coursework (15 hours) as listed in this catalog. Upon completion of the 15 hours defined in the program, the student will receive a Graduate Certificate in the appropriate field of study. After completion of the 15 hour Graduate Certificate, the student may continue to fulfill the requirements of the MPS degree. Students are required to meet all graduate student requirements that include maintaining their GPA at the 3.0 level.

Professional Studies, Corporate Communication Concentration, M.P.S.

Professional Studies Program Information

Degree Requirements

The MPS in Corporate Communication prepares the professional to excel in the field of corporate communication. This concentration provides a focus on the areas of communication including organizational and interpersonal communication and leadership.

- **Required Core Courses:** 12 hours
- **Required Concentration Courses:** 18 hours
- **Total Degree Requirement:** 30 hours

Required Core Courses (12 hours)

- PRST 6100 - Professional Environment: Issues and Ethics Cr. 3.
- PRST 6110 - Leadership and Communication Cr. 3.
OR
- COMM 6110 - Leadership and Communication Credit 3.
- PRST 6300 - Research Methods Cr. 3.
- PRST 6998 - Professional Project Cr. 3.
OR
- COMM 6998 - Professional Project CREDIT 3.
OR
- JOUR 6998 - Professional Project Credit 3.

Required Concentration Courses (choose 18 hours)

Choose at least six courses from the following concentration course listing:

- COMM 5420 - Advanced Organizational Communication Credit 3.
- COMM 4430 (5430) - Interpersonal Communication Cr. 3.
- COMM 4620 (5620) - Advanced Public Speaking Cr. 3.
- COMM 4630 (5630) - Persuasion Cr. 3.
- COMM 5603 - Special Topics in Speech Communication Cr. 3.
- COMM 6700 - Conflict Management and Negotiation Credit 3.
OR
- PRST 6700 - Conflict Management and Negotiation Cr. 3.
- PRST 6200 - Globalization and the Professions Cr. 3.
- PRST 6720 - Crisis Response Management Cr. 3.
- PRST 6751 - Global Terrorism - Pandemics and Epidemics Cr. 3.

- PRST 6790-6799 - Special Topics Cr. 3.
- PRST 6800 - Organizational Skills and Development Cr. 3.

Course Substitutions

Course Substitutions are allowed upon approval of the graduate advisory committee, department chair/director, and dean of the college.

Professional Studies, Healthcare Administration Concentration, M.P.S.

Professional Studies Program Information

Degree Requirements

- **Required Core Courses:** 12 hours
- **Required Concentration Courses:** 15 hours
- **Advisor Guided Elective:** 3 hours
- **Total Degree Requirement:** 30 hours

Required Core Courses (12 hours)

- PRST 6100 - Professional Environment: Issues and Ethics Cr. 3.
- PRST 6110 - Leadership and Communication Cr. 3.
- PRST 6300 - Research Methods Cr. 3.
- PRST 6998 - Professional Project Cr. 3.

Required Concentration Courses (15 hours)

- PRST 6200 - Globalization and the Professions Cr. 3.
- PRST 6421 - Strategic Organizational Program Planning and Evaluation Cr. 3.
- PRST 6530 - Healthcare Systems Economics Cr. 3.
- PRST 6540 - Health Informatics Cr. 3.
- PRST 6550 - Computer Based Decision Modeling for Healthcare Administrators Cr. 3.
- PRST 6560 - Biological Sciences for Healthcare Administrators Cr. 3.
- PRST 6570 - Public Health Cr. 3.
- PRST 6721 - Managing Emergency Volunteers Cr. 3.
- PRST 6751 - Global Terrorism - Pandemics and Epidemics Cr. 3.
- PRST 6781 - Science of Contact Tracing Cr. 3.
- PRST 6790-6799 - Special Topics Cr. 3.
- PRST 6810 - Internship Cr. 3.

Advisor Guided Elective (3 hours)

- Any PRST 6000 level course or course approved by advisor

Course Substitutions

Course Substitutions are allowed upon approval of the graduate advisory committee, department chair/director, and dean of the college.

Professional Studies, Human Resources Leadership Concentration, M.P.S

Professional Studies Program Information

Degree Requirements

- **Required Core Courses:** 12 hours
- **Required Concentration Courses:** 15 hours
- **Advisor Guided Elective:** 3 hours
- **Total Degree Requirement:** 30 hours

Required Core Courses (12 hours)

- PRST 6100 - Professional Environment: Issues and Ethics Cr. 3.
- PRST 6110 - Leadership and Communication Cr. 3.
- PRST 6300 - Research Methods Cr. 3.
- PRST 6998 - Professional Project Cr. 3.

Required Concentration Courses (15 hours)

- PRST 6040 - Human Resources Management Cr. 3.
- PRST 6105 - Project Planning and Scheduling Cr. 3.
- PRST 6200 - Globalization and the Professions Cr. 3.
- PRST 6310 - Leadership in Organization Cr. 3.
- PRST 6421 - Strategic Organizational Program Planning and Evaluation Cr. 3.
- PRST 6500 - Foundations of Leadership Cr. 3.
- PRST 6700 - Conflict Management and Negotiation Cr. 3.
- PRST 6721 - Managing Emergency Volunteers Cr. 3.
- PRST 6781 - Science of Contact Tracing Cr. 3.
- PRST 6790-6799 - Special Topics Cr. 3.
- PRST 6800 - Organizational Skills and Development Cr. 3.
- PRST 6810 - Internship Cr. 3.
- PRST 6910 - Employment and Human Resources Law Cr. 3.
- PRST 6920 - Diversity in the Workplace Cr. 3.
- PRST 6930 - Compensation and Benefits Cr. 3.
- PRST 6940 - Recruitment, Selection, and Retention Cr. 3.

Advisor Guided Elective (3 hours)

- Any PRST 6000 level course or course approved by advisor

Course Substitutions

Course Substitutions are allowed upon approval of the graduate advisory committee, department chair/director, and dean of the college.

Professional Studies, Media and Strategic Communication Concentration, M.P.S.

Professional Studies Program Information

Degree Requirements

The Media and Strategic Communication concentration prepares you to lead in the exciting areas of event planning and programming, public relations, marketing and other strategic areas.

- **Required Core Courses:** 12 hours
- **Required Concentration Courses:** 18 hours
- **Total Degree Requirement:** 30 hours

Required Core Courses (12 hours)

- PRST 6100 - Professional Environment: Issues and Ethics Cr. 3.
- COMM 6110 - Leadership and Communication Credit 3. OR
- PRST 6110 - Leadership and Communication Cr. 3.
- PRST 6300 - Research Methods Cr. 3.
- COMM 6998 - Professional Project CREDIT 3. OR
- JOUR 6998 - Professional Project Credit 3. OR
- PRST 6998 - Professional Project Cr. 3.

Required Concentration Courses (18 hours)

- COMM 4630 (5630) - Persuasion Cr. 3.
- JOUR 4460 (5460) - Public Relations--Cases and Practices Cr. 3.
- JOUR 4500 (5500) - Advanced Multimedia Storytelling Credit 3.
- JOUR 4820 (5820) - Advanced Reporting Cr. 3.
- JOUR 4830 (5830) - Feature Writing Cr. 3.
- JOUR 4930 (5930) - Advanced Copy Editing Cr. 3.
- JOUR 5030 - Field Experience in Event Planning Cr. 3.
- JOUR 5843, 5846, or 5849 - Special Problems Cr. 3.
- JOUR 6450 - Public Relations Management Cr. 3.
- MKT 6100 - Strategic Marketing Cr. 3.
- MKT 6500 - Advanced Marketing Analysis Cr. 3.
- PRST 6200 - Globalization and the Professions Cr. 3.
- PRST 6800 - Organizational Skills and Development Cr. 3.

- PRST 6790-6799 - Special Topics Cr. 3.
- PRST 6720 - Crisis Response Management Cr. 3.

Course Substitutions

Course Substitutions are allowed upon approval of the graduate advisory committee, department chair/director, and dean of the college.

Professional Studies, Public Safety Concentration, M.P.S.

Professional Studies Program Information

Degree Requirements

- **Required Core Courses:** 12 hours
- **Required Concentration Courses:** 15 hours
- **Advisor Guided Elective:** 3 hours
- **Total Degree Requirement:** 30 hours

Required Core Courses (12 hours)

- PRST 6100 - Professional Environment: Issues and Ethics Cr. 3.
- PRST 6110 - Leadership and Communication Cr. 3.
- PRST 6300 - Research Methods Cr. 3.
- PRST 6998 - Professional Project Cr. 3.

Required Concentration Courses (15 hours)

- PRST 6200 - Globalization and the Professions Cr. 3.
- PRST 6700 - Conflict Management and Negotiation Cr. 3.
- PRST 6710 - Risk Assessment & Prevention Cr. 3.
- PRST 6720 - Crisis Response Management Cr. 3.
- PRST 6721 - Managing Emergency Volunteers Cr. 3.
- PRST 6730 - Leadership in Public Safety Cr. 3.
OR
- PRST 6500 - Foundations of Leadership Cr. 3.
- PRST 6740 - Diversity in Public Safety Cr. 3.
OR
- PRST 6920 - Diversity in the Workplace Cr. 3.
- PRST 6750 - Preparedness and Mitigation Cr. 3.
- PRST 6751 - Global Terrorism - Pandemics and Epidemics Cr. 3.
- PRST 6760 - Funding in Public Safety Cr. 3.
- PRST 6780 - Intelligence Gathering Cr. 3.
- PRST 6781 - Science of Contact Tracing Cr. 3.

- PRST 6790-6799 - Special Topics Cr. 3.
- PRST 6800 - Organizational Skills and Development Cr. 3.
- PRST 6911 - Constitution and Society Cr. 3.

Advisor Guided Elective (3 hours)

- Any PRST 6000 level course or course approved by advisor

Course Substitutions

Course Substitutions are allowed upon approval of the graduate advisory committee, department chair/director, and dean of the college.

Professional Studies, Strategic Leadership Concentration, M.P.S.

Professional Studies Program Information

Degree Requirements

- **Required Core Courses:** 12 hours
- **Required Concentration Courses:** 15 hours
- **Advisor Guided Elective:** 3 hours
- **Total Degree Requirement:** 30 hours

Required Core Courses (12 hours)

- PRST 6100 - Professional Environment: Issues and Ethics Cr. 3.
- PRST 6110 - Leadership and Communication Cr. 3.
- PRST 6300 - Research Methods Cr. 3.
- PRST 6998 - Professional Project Cr. 3.

Required Concentration Courses (15 hours)

- ELPA 6560 - Small Group Leadership Cr. 3.
- JOUR 6450 - Public Relations Management Cr. 3.
- LDSP 6000 - Current Issues and Cases in Leadership Cr. 3.
- PRST 6040 - Human Resources Management Cr. 3.
- PRST 6105 - Project Planning and Scheduling Cr. 3.
- PRST 6200 - Globalization and the Professions Cr. 3.
- PRST 6310 - Leadership in Organization Cr. 3.
- PRST 6421 - Strategic Organizational Program Planning and Evaluation Cr. 3.
- PRST 6500 - Foundations of Leadership Cr. 3.
- PRST 6700 - Conflict Management and Negotiation Cr. 3.
- PRST 6721 - Managing Emergency Volunteers Cr. 3.
- PRST 6730 - Leadership in Public Safety Cr. 3.

- PRST 6770 - Computer-Based Decision Modeling Cr. 3.
- PRST 6790-6799 - Special Topics Cr. 3.
- PRST 6800 - Organizational Skills and Development Cr. 3.
- PRST 6810 - Internship Cr. 3.

Advisor Guided Elective (3 hours)

- Any PRST 6000 level course or course approved by advisor

Course Substitutions

Course Substitutions are allowed upon approval of the graduate advisory committee, department chair/director, and dean of the college.

Professional Studies, Teaching English to Speakers of Other Languages (TESOL) Concentration, M.P.S.

Professional Studies Program Information

Degree Requirements

- **Required Core Courses:** 12 hours
- **Required Concentration Courses:** 15 hours
- **Advisor Guided Elective:** 3 hours
- **Total Degree Requirement:** 30 hours

Required Core Courses (12 hours)

- PRST 6100 - Professional Environment: Issues and Ethics Cr. 3.
- PRST 6110 - Leadership and Communication Cr. 3.
- PRST 6300 - Research Methods Cr. 3.
- PRST 6998 - Professional Project Cr. 3.

Required Concentration Courses (15 hours)

- CUED 6010 - Curriculum Development and Evaluation Cr. 3.
- CUED 6100 - Instructional Strategies Cr. 3.
- CUED 6440 - Emerging Technologies in Education Cr. 3.
- CUED 6920 - Topics Cr. 1-6.
- ESLP 4200 (5200) - ESL Assessment: Reading and Writing Cr. 3.
- ENGL 4511 (5511) - Introduction to Descriptive Linguistics Cr. 3.
- ENGL 4531 (5531) - Grammar and Language Cr. 3.
- PRST 6200 - Globalization and the Professions Cr. 3.
- PRST 6320 - Comparative Issues in Higher Education Cr. 3.
- PRST 6330 - International Issues in Education Policy and Practice Cr. 3.
- PRST 6790-6799 - Special Topics Cr. 3.

Advisor Guided Elective (3 hours)

- Any PRST 6000 level course or course approved by advisor

Course Substitutions

Course Substitutions are allowed upon approval of the graduate advisory committee, department chair/director, and dean of the college.

Professional Studies, Training and Development Concentration, M.P.S.

Professional Studies Program Information

Degree Requirements

- **Required Core Courses:** 12 hours
- **Required Concentration Courses:** 15 hours
- **Advisor Guided Elective:** 3 hours
- **Total Degree Requirement:** 30 hours

Required Core Courses (12 hours)

- PRST 6100 - Professional Environment: Issues and Ethics Cr. 3.
- PRST 6110 - Leadership and Communication Cr. 3.
- PRST 6300 - Research Methods Cr. 3.
- PRST 6998 - Professional Project Cr. 3.

Required Concentration Courses (15 hours)

- PRST 6040 - Human Resources Management Cr. 3.
- PRST 6105 - Project Planning and Scheduling Cr. 3.
- PRST 6200 - Globalization and the Professions Cr. 3.
- PRST 6400 - Instructional Design for Training and Development Cr. 3.
- PRST 6410 - Evaluation of Learning Cr. 3.
- PRST 6420 - Organizational Needs Analysis Cr. 3.
- PRST 6421 - Strategic Organizational Program Planning and Evaluation Cr. 3.
- PRST 6430 - Instructional Design for Electronic Training Cr. 3.
- PRST 6440 - Teaching Online Cr. 3.
- PRST 6450 - Computer-based Instruction Cr. 3.
- PRST 6470 - Facilitation of Learning Cr. 3.
- PRST 6790-6799 - Special Topics Cr. 3.
- PRST 6800 - Organizational Skills and Development Cr. 3.
- PRST 6810 - Internship Cr. 3.
- PRST 6910 - Employment and Human Resources Law Cr. 3.
- PRST 6920 - Diversity in the Workplace Cr. 3.

Advisor Guided Elective (3 hours)

- Any PRST 6000 level course or course approved by advisor

Course Substitutions

Course Substitutions are allowed upon approval of the graduate advisory committee, department chair/director, and dean of the college.

Certificate

Healthcare Administration Certificate

Professional Studies: Healthcare Informatics Certificate

Healthcare Informatics is a high-demand area of expertise utilizing statistics, health informatics and technology. Graduates from this concentration must synthesize information from the sciences (pharmacology, pathophysiology), technology (computer-based decision modeling, health informatics), and statistics. The Healthcare Informatics certificate track is much more focused on understanding and using computer tools such as computer based decision modeling and applied statistical analyses.

The 15 credit hour Healthcare Informatics Certificate is comprised of five courses as defined below:

Certificate Requirements

- PRST 6200 - Globalization and the Professions Cr. 3.
- PRST 6421 - Strategic Organizational Program Planning and Evaluation Cr. 3.
- PRST 6530 - Healthcare Systems Economics Cr. 3.
- PRST 6540 - Health Informatics Cr. 3.
- PRST 6550 - Computer Based Decision Modeling for Healthcare Administrators Cr. 3.
- PRST 6560 - Biological Sciences for Healthcare Administrators Cr. 3.
- PRST 6570 - Public Health Cr. 3.
- PRST 6721 - Managing Emergency Volunteers Cr. 3.
- PRST 6751 - Global Terrorism - Pandemics and Epidemics Cr. 3.
- PRST 6781 - Science of Contact Tracing Cr. 3.
- PRST 6810 - Internship Cr. 3.
- PRST 6790-6799 - Special Topics Cr. 3.

Professional Studies: Human Resource Leadership Certificate

Human Resource professionals are increasingly becoming an integral part of an organization's strategic planning process. Company executives turn to HR professionals for policy directives and creative ways to use human capital for improved performance results.

The Human Resources Leadership Certificate through the School of Professional Studies focuses on a variety of workplace factors (economic, environmental, ethical, legal, political and administrative) and the impact they can have on organizational productivity, performance, and behavior.

The objective of this program is to help students develop a strong foundation in HR principles and procedures, as well as develop critical thinking skills required to make good decisions and solve problems concerning the human side of business.

An interdisciplinary studies approach to this field is a perfect fit - succeeding in human resources requires a variety of skills, abilities, experiences, knowledge and the excellent graduate-level degree education students will receive through the flexible and rewarding program.

The student will complete 15 credit hours of coursework (course options are listed below) to earn the Graduate Certificate in Human Resources Leadership.

Certificate Requirements

- PRST 6040 - Human Resources Management Cr. 3.
- PRST 6105 - Project Planning and Scheduling Cr. 3.
- PRST 6200 - Globalization and the Professions Cr. 3.
- PRST 6421 - Strategic Organizational Program Planning and Evaluation Cr. 3.
- PRST 6700 - Conflict Management and Negotiation Cr. 3.
- PRST 6721 - Managing Emergency Volunteers Cr. 3.
- PRST 6781 - Science of Contact Tracing Cr. 3.
- PRST 6800 - Organizational Skills and Development Cr. 3.
- PRST 6810 - Internship Cr. 3.
- PRST 6910 - Employment and Human Resources Law Cr. 3.
- PRST 6920 - Diversity in the Workplace Cr. 3.
- PRST 6930 - Compensation and Benefits Cr. 3.
- PRST 6940 - Recruitment, Selection, and Retention Cr. 3.
- PRST 6790-6799 - Special Topics Cr. 3.

Professional Studies: Project Management for the Professional Certificate

TTU's online Project Management for the Professional Concentration and Certificate prepares students to meet the growing demands for project management with courses grounded in the methodologies, strategies, skills, and tactics critical for success. The program accepts students from a variety of backgrounds providing professionals the opportunity to transition from one career to another. The program does not require a calculus background. The certificate is a 15 credit hour program and consists of 12 credit hours in required courses and 3 credit hours in elective courses.

The courses are 7-weeks long and can be taken completely online. The program can be taken as part of the Master of Professionals Studies degree (30 hours) or as a 15 hour graduate certificate or as a non-degree seeking student. The program uses the Project Management Body of Knowledge Manual but is not accredited through PMI; consequently, TTU can explore other schools of thought. Students completing the program receive training from PMI certified instructors as well as 20+ year veterans of industry.

Project Management Certificate Required Courses (12 Hours)

Courses required (12 hours)

- PRST 6820 - Introduction to Project Management Expectations and Methodology Lec. 3
- PRST 6830 - Project Management Processes and Development Strategies Cr. 3

- PRST 6840 - Project Management: Schedule and Finance Cr. 3
- PRST 6850 - Project Management: Risk Mitigation, Risk Assessment, and Quality Assurance Cr. 3

Project Management Certificate Elective Courses (3 Hours)

Students will choose one course from the list of courses provided.

- PRST 6860 - Project Management: Conflict Management in Projects Cr. 3.
or
- PRST 6870 - Project Management for IT Professionals Cr. 3.
or
- PRST 6880 - Project Management for Healthcare Administration Cr. 3
or
- PRST 6800 - Organizational Skills and Development Cr. 3.
or
- PRST 6810 - Internship Cr. 3.

Professional Studies: Project Management for the Professional Concentration

TTU's online Project Management concentration (18 hours) prepares students to meet the growing demands for project management with courses grounded in the methodologies, strategies, skills, and tactics critical for success. The program accepts students from a variety of backgrounds providing professionals the opportunity to transition from one career to another. The program does not require a calculus background.

The courses are 7-weeks long and can be taken completely online. The new concentration will be part of the Master of Professionals Studies degree (30 hours).

Degree Requirements

- **Required Core Courses:** 12 hours
- **Required Concentration Courses:** 15 hours
- **Advisor Guided Electives:** 3 hours
- **Total Degree Requirement:** 30 hours

Required Core Courses (12 hours)

- PRST 6100 - Professional Environment: Issues and Ethics Cr. 3.
- PRST 6110 - Leadership and Communication Cr. 3.
- PRST 6300 - Research Methods Cr. 3.
- PRST 6998 - Professional Project Cr. 3.

Required Courses (12 credit hours)

Students must complete the following required concentration courses:

- PRST 6820 - Introduction to Project Management Expectations and Methodology Lec. 3
- PRST 6830 - Project Management Processes and Development Strategies Cr. 3
- PRST 6840 - Project Management: Schedule and Finance Cr. 3

- PRST 6850 - Project Management: Risk Mitigation, Risk Assessment, and Quality Assurance Cr. 3

Project Management Elective Courses (6 credit hours)

Students may choose two courses from the list below:

- PRST 6860 - Project Management: Conflict Management in Projects Cr. 3.
or
- PRST 6870 - Project Management for IT Professionals Cr. 3.
or
- PRST 6880 - Project Management for Healthcare Administration Cr. 3
or
- PRST 6800 - Organizational Skills and Development Cr. 3.
or
- PRST 6810 - Internship Cr. 3.

See advisor for additional courses that may be substituted for the above elective(s).

Professional Studies: Teaching English to Speakers of Other Languages Certificate

Overview

The TESOL Certificate and concentration are designed to meet an ongoing demand for both initial preparation and continuing education for individuals who plan to teach or are currently teaching English as a second/foreign language in various educational settings. This includes students with strong English-speaking backgrounds who desire to teach English as a second/foreign language to adults in the United States or abroad or to traditional students in another country. This program would also meet the needs of non-native teachers of English in other countries looking to receive additional English language and pedagogical training from an American university. This program is not for students seeking an ESL endorsement for teaching in U.S public schools.

Students will complete 15 credit hours (see course options below) to earn the Graduate Certificate in TESOL.

Certificate Requirements

- PRST 6200 - Globalization and the Professions Cr. 3.
- PRST 6320 - Comparative Issues in Higher Education Cr. 3.
- PRST 6330 - International Issues in Education Policy and Practice Cr. 3.
- ENGL 4531 (5531) - Grammar and Language Cr. 3.
- ENGL 4511 (5511) - Introduction to Descriptive Linguistics Cr. 3.
- ESLP 4200 (5200) - ESL Assessment: Reading and Writing Cr. 3.
- CUED 6010 - Curriculum Development and Evaluation Cr. 3.
- CUED 6440 - Emerging Technologies in Education Cr. 3.
- CUED 6920 - Topics Cr. 1-6.
- PRST 6790-6799 - Special Topics Cr. 3.

Professional Studies: Public Safety Certificate

The certificate program in Public Safety is an interdisciplinary program of study designed to provide the public safety professional with leadership and strategic management tools to lead and serve in one of the nation's growing professions. The focus of the program is to provide these professionals with the opportunity to develop important skills in risk assessment and disaster preparations, crisis response, public safety leadership, research, and

administration in the various components of law enforcement security, emergency management, and other public service systems that include local, state, and federal agencies.

Students will complete 15 credit hours of required courses (see list below) to achieve the Graduate Certificate in Public Safety.

Certificate Requirements

- PRST 6200 - Globalization and the Professions Cr. 3.
- PRST 6700 - Conflict Management and Negotiation Cr. 3.
- PRST 6710 - Risk Assessment & Prevention Cr. 3.
- PRST 6720 - Crisis Response Management Cr. 3.
- PRST 6730 - Leadership in Public Safety Cr. 3.
- or
- PRST 6721 - Managing Emergency Volunteers Cr. 3.
- PRST 6500 - Foundations of Leadership Cr. 3.
- PRST 6740 - Diversity in Public Safety Cr. 3.
- PRST 6750 - Preparedness and Mitigation Cr. 3.
- PRST 6751 - Global Terrorism - Pandemics and Epidemics Cr. 3.
- PRST 6780 - Intelligence Gathering Cr. 3.
- PRST 6781 - Science of Contact Tracing Cr. 3.
- PRST 6790-6799 - Special Topics Cr. 3.
- PRST 6800 - Organizational Skills and Development Cr. 3.
- PRST 6911 - Constitution and Society Cr. 3.
- PRST 6920 - Diversity in the Workplace Cr. 3.

Professional Studies: Strategic Leadership Certificate

A certificate in Strategic Leadership prepares students to lead in today's rapidly changing professional environment. A certificate in strategic leadership exposes students to guiding principles that can be applied to any career field. This certificate explores the topic from a contemporary perspective facing a dynamic global business environment.

Certificate requirements emphasize competencies for implementing organizational systems, managing and communicating change, and resolving conflict within a framework of ethical leadership. The program gives students an opportunity to expand their understanding of inclusive and collaborative leadership behaviors and develop skills for using them effectively.

Throughout the program students will continually reflect on, assess and frame their own personal leadership style, strengths and weaknesses. The interdisciplinary approach integrates administration with leadership competencies that develop visionary professionals who can think critically, evaluate process, strategize, innovate practices, communicate, and manage changes that will position their organization for future success.

The student will complete 15 credit hours of coursework (see list below) to receive the Graduate Certificate in Strategic Leadership.

Certificate Requirements

- PRST 6040 - Human Resources Management Cr. 3.
- PRST 6105 - Project Planning and Scheduling Cr. 3.
- PRST 6200 - Globalization and the Professions Cr. 3.

- PRST 6310 - Leadership in Organization Cr. 3.
- PRST 6500 - Foundations of Leadership Cr. 3.
- PRST 6421 - Strategic Organizational Program Planning and Evaluation Cr. 3.
- PRST 6700 - Conflict Management and Negotiation Cr. 3.
- PRST 6721 - Managing Emergency Volunteers Cr. 3.
- PRST 6730 - Leadership in Public Safety Cr. 3.
- PRST 6770 - Computer-Based Decision Modeling Cr. 3.
- PRST 6790-6799 - Special Topics Cr. 3.
- PRST 6800 - Organizational Skills and Development Cr. 3.
- PRST 6810 - Internship Cr. 3.
- ELPA 6560 - Small Group Leadership Cr. 3.
- LDSP 6000 - Current Issues and Cases in Leadership Cr. 3.
- JOUR 6450 - Public Relations Management Cr. 3.

Professional Studies: Training and Development Certificate

The Training and Development certificate program equips leaders for the growing and evolving field of workplace learning and performance. Students will build both theoretical and practical knowledge and skills in adult learning and cognition, organizational needs analysis, project planning, instructional design, development, and delivery/evaluation in traditional and virtual environments.

The goal of the certificate is to prepare students for employment opportunities where the effective transfer of learning is critical to an organization's success in achieving its overall goals and objectives.

Students will be ready to manage, deliver and assess on-site performance-based training, instructional design, and address the needs of human resource managers and other professionals who are increasingly relying on technology to deliver workforce education.

The student will complete 15 credit hours of coursework (see options below) to earn the Graduate Certificate in Training and Development.

Certificate Requirements

- PRST 6040 - Human Resources Management Cr. 3.
- PRST 6105 - Project Planning and Scheduling Cr. 3.
- PRST 6200 - Globalization and the Professions Cr. 3.
- PRST 6400 - Instructional Design for Training and Development Cr. 3.
- PRST 6410 - Evaluation of Learning Cr. 3.
- PRST 6420 - Organizational Needs Analysis Cr. 3.
- PRST 6470 - Facilitation of Learning Cr. 3.
- PRST 6421 - Strategic Organizational Program Planning and Evaluation Cr. 3.
- PRST 6430 - Instructional Design for Electronic Training Cr. 3.
- PRST 6440 - Teaching Online Cr. 3.
- PRST 6450 - Computer-based Instruction Cr. 3.
- PRST 6800 - Organizational Skills and Development Cr. 3.
- PRST 6910 - Employment and Human Resources Law Cr. 3.
- PRST 6920 - Diversity in the Workplace Cr. 3.
- PRST 6810 - Internship Cr. 3.

- PRST 6790-6799 - Special Topics Cr. 3.

Professional Science Master's

Professional Science Master's, P.S.M.

The Professional Science Master's (PSM) degree is a unique professional degree grounded in natural science, technology, engineering, mathematics and/or computational sciences and is designed to prepare students for direct entry into a variety of career options in industry, business, government, or non-profit organizations. It is a distinctive advanced degree for those intending to pursue a career in the practice of science. PSM programs prepare graduates for high-level careers in science that have a strong emphasis on such skill areas as management, policy, and entrepreneurship. PSM recognition provides assurance that the program conforms to nationally accepted criteria.

Professional Science, Environmental Informatics Concentration, P.S.M.

Environmental Informatics Program Information

Population growth, pollution, and limited natural resources, result in increasingly topical environmental issues. The Professional Science Master's with a concentration in Environmental Informatics degree program effectively prepares you for a career dedicated to sustaining Earth's resources for future generations.

Environmental Informatics combines existing courses in the Colleges of Business, Arts and Sciences, Agricultural and Human Sciences, and Engineering to effectively produce a new and essential degree. Currently, the business core courses are offered online and on campus through TTU's MBA program.

Environmental Informatics will also use an interdisciplinary approach of course delivery by incorporating faculty from the Colleges of Business, Arts and Sciences, and Engineering.

There are increasing numbers of career opportunities for professionals with this degree. Environmental scientists and technicians are required to meet increasing demands placed on companies as worldwide awareness of environmentalism increases. Statistics show many professionals in this field will soon be retiring, leaving space for the next generation of environmentalists.

The program is designed for graduates of approved natural resources undergraduate programs (e.g., environmental biology, environmental chemistry, environmental engineering, water resources engineering, geology, environmental agriculture, environmental management, etc.).

Admission Requirements

- Undergraduate degree in science, technology, engineering, or mathematics discipline* with GPA of at least 3.0 on a 4.0 scale; [OR] a total score of at least 300 on verbal and quantitative portions of the GRE® General Test along with a score of at least 3.5 score on the analytical writing portion of the test.
- Official transcripts from all previously-attended colleges or universities
- Three (3) letters of recommendation from faculty or supervisors familiar with the academic ability of the applicant.
- International applicants must also meet the English Language Requirement by providing test results on one (1) of the following:
 - TOEFL -- 550 minimum (213 computer-based or 79 internet-based)
 - IELTS -- minimum base score of 6.0

*Applicants that have baccalaureate degrees in a closely related field will be evaluated on a case-by-case basis and may be admitted to full standing upon completion of identified background courses.

Fast-Track in Environmental Informatics

This will allow selected undergraduates to enroll for up to six (6) hours of graduate courses prior to formal admission to the P.S.M., Environmental Informatics program. The courses taken during the student's junior/senior year can be used to satisfy both undergraduate and graduate degree requirements. Participation does not change the requirements for either the undergraduate or graduate program in Environmental Informatics. Once admitted to this program, the student will be allowed to enroll in appropriate courses in the junior or senior year with the consent of the student's undergraduate advisor and the Director of the P.S.M. program. Courses completed at the Graduate Level are only guaranteed to apply to the completion of the P.S.M. Environmental Informatics program.

Admission to Fast-Track

Minimum requirements for admission are:

- Applicant must be earning a baccalaureate degree in a related field, which will be evaluated on a case-by-case basis
- Recommendation of a faculty member in the student's major
- Overall GPA of 3.0
- Program participants should consult with their future P.S.M. advisor regarding appropriate graduate courses to take during their junior/senior year.
- The student must earn a minimum grade of "B" in the graduate courses in order to apply them to their P.S.M. program of study.
- All requirements for full admission to Graduate School must be met upon undergraduate graduation. Students in the Fast-Track program must still apply for admission to the Graduate School and meeting Fast-Track requirements does not necessarily guarantee admission to the PSM-Environmental Informatics degree program.
- Students who do not succeed in their first graduate course (B grade or better) will be advised to withdraw from the Fast Track program and complete their B.S. degree in a normal manner.

Fulfilling the above minimum requirements does not guarantee acceptance into the Professional Science Master's, Environmental Informatics Fast Track program. Students who meet the above minimum requirements must consult with the College of Interdisciplinary Studies and the School of Environmental Studies for eligibility and acceptance.

Degree Requirements

The Professional Science Master's degree in Environmental Informatics is a 33 hour degree program. The degree requirements include:

- **Required Business and Statistics Courses:** 9 hours
- **Concentration Course Requirements:** 18 hours
- **Advisor Guided Electives:** 6 hours
- **Total Degree Requirements:** 33 hours

Curriculum

Required Business and Statistics Courses (9 hours)

- BIOL 4220 (5220) - Biostatistics Cr. 3.
or
- MATH 6070 - Applied Linear Statistical Methods I Cr. 3.
or
- PRST 6600 - Statistical Analysis Cr. 3.

or

- PSY 6310 - Educational Statistics Cr. 3.
- BMGT 6200 - Organizational Leadership Cr. 3.
- MKT 6100 - Strategic Marketing Cr. 3.

Concentration Course Requirements (18 hours)

- ESS 6000 - Environmental Law Cr. 3.
- ESS 6510 - Programming GIS Cr. 3.
- ESS 6520 - Environmental Informatics Python Applications and Machine Learning Cr. 3.
- ESS 6910 - Internship Cr. 3.
- GEOG 4410 (5410) - Remote Sensing Cr. 3.
- GEOG 4650 (5650) - Environmental Applications of GIS Cr. 3.

Advisor Guided Electives (6 hours)

- ACCT 6010 - Accounting Information for Management Decisions Cr. 3.
- CSC 6220 - Data Mining Cr. 3.
- CSC 6300 - Web-Based Database Systems Cr. 3.
- DS 6550 - Database Management Cr. 3.
- ESS 4300 (5300) - Environmental Management System Cr. 3.
- ESS 6970 - Special Topics Cr. 1-4
- EVS 7900 - Scientific Writing and Grantmanship Cr. 3.
- GEOG 4850 (5850) - Advanced GIS Cr. 3.
- MATH 6080 - Applied Linear Statistical Methods II Cr. 3.
- MATH 6470 - Environmental Statistics Cr. 3.
- PSY 7310 - Advanced Educational Statistics Cr. 3.

Total Credit Hours: 33

Background Courses

Students may be advised to take background courses as preparation for the GIS portion of the degree program. The advisor will determine, with the GIS faculty, if a student should complete a competency test or enroll in the background coursework.

- GEOG 4510 (5510) - Theory of GIS I Cr. 3.
- GEOG 4511 (5511) - Theory of GIS II Cr. 3.

Course Substitutions

Course Substitutions are allowed upon approval of the graduate advisory committee, department chair/director, and dean of the college.

Certificate

Managerial Environmental Informatics Certificate

The School of Environmental Studies offers a 15 credit-hour graduate certificate in the field of Managerial Environmental Informatics. This certificate will appeal to working professionals in government agencies and industry. Students may receive the certificate as part of their 33 credit-hour PSM degree or may receive the certificate as a standalone program. All students apply and are admitted to the PSM Environmental Informatics degree program.

Certificate Requirements

The following courses are required for the certificate in Managerial Environmental Informatics:

- GEOG 4410 (5410) - Remote Sensing Cr. 3.
OR
- GEOG 4650 (5650) - Environmental Applications of GIS Cr. 3.

- EVSS 6010 - Environmental Social Policy Cr. 3.
OR
- ESS 6000 - Environmental Law Cr. 3.

- One graduate-level statistics course from **Approved List A** (see below) Cr. 3.

- BMGT 6200 - Organizational Leadership Cr. 3.
OR
- PRST 6110 - Leadership and Communication Cr. 3.
OR
- PRST 6310 - Leadership in Organization Cr. 3.
OR
- PRST 6500 - Foundations of Leadership Cr. 3.

- One directed elective from **Approved List B** (see below) Cr. 3.

Total Credit Hours for Certificate: 15

Approved List A:

- AGBE 4210 (5210) - Agricultural and Biological Statistics Cr. 3.
- BIOL 4220 (5220) - Biostatistics Cr. 3.
- BIOL 6140 - Fish and Wildlife Biometrics Cr. 3.
- PSY 6310 - Educational Statistics Cr. 3.
- MATH 6070 - Applied Linear Statistical Methods I Cr. 3.
- MATH 6080 - Applied Linear Statistical Methods II Cr. 3.
- MATH 6170 - Experimental Design I Cr. 3.
- MATH 6180 - Experimental Design II Cr. 3.
- MATH 6470 - Environmental Statistics Cr. 3.
- PRST 6600 - Statistical Analysis Cr. 3.
- SOC 4920 (5920) - Data Analysis and Management Cr. 3.

Approved List B:

- ACCT 6010 - Accounting Information for Management Decisions Cr. 3.
- Econ 4200 (5200) - Environmental Economics Cr. 3
- EVS 7900 - Scientific Writing and Grantmanship Cr. 3.
- MKT 6100 - Strategic Marketing Cr. 3.
- PRST 6040 - Human Resources Management Cr. 3.
- PRST 6100 - Professional Environment: Issues and Ethics Cr. 3.
- PRST 6700 - Conflict Management and Negotiation Cr. 3.
- PRST 6920 - Diversity in the Workplace Cr. 3.

Technical Environmental Informatics Certificate

The School of Environmental Studies offers a 15 credit-hour graduate certificate in the field of Technical Environmental Informatics. This certificate will appeal to working professionals in government agencies and industry. Students may receive the certificate as part of their 33 credit-hour PSM degree or may receive the certificate as a standalone program. All students apply and are admitted to the PSM Environmental Informatics degree program.

Certificate Requirements

The following courses are required for the certificate in Technical Environmental Informatics:

- GEOG 4410 (5410) - Remote Sensing Cr. 3.
OR
- GEOG 4650 (5650) - Environmental Applications of GIS Cr. 3.
- EVSS 6010 - Environmental Social Policy Cr. 3.
OR
- ESS 6000 - Environmental Law Cr. 3.
- One graduate-level statistics course from **Approved List A** Cr. 3
- CSC 6220 - Data Mining Cr. 3.
OR
- CSC 6230 - Machine Learning Cr. 3.
- or
- ESS 6520 - Environmental Informatics Python Applications and Machine Learning Cr. 3.
- ESS 6510 - Programming GIS Cr. 3.

Total Credit Hours for Certificate: 15 hours

Approved List A:

- BIOL 4220 (5220) - Biostatistics Cr. 3.
- BIOL 6140 - Fish and Wildlife Biometrics Cr. 3.
- PSY 6310 - Educational Statistics Cr. 3.
- MATH 6070 - Applied Linear Statistical Methods I Cr. 3.

- MATH 6080 - Applied Linear Statistical Methods II Cr. 3.
- MATH 6170 - Experimental Design I Cr. 3.
- MATH 6180 - Experimental Design II Cr. 3.
- MATH 6470 - Environmental Statistics Cr. 3.
- PRST 6600 - Statistical Analysis Cr. 3.
- SOC 4920 (5920) - Data Analysis and Management Cr. 3.

Whitson-Hester School of Nursing

Kim Hanna, Dean

Schools and Program Information

Overview

The Whitson Hester School of Nursing offers the Master of Science in Nursing Degree (MSN), Post certification programs, and the Doctor of Nursing Practice Degree (DNP) which is a joint program between TTU and ETSU.

The Master of Science in Nursing Degree (MSN) is delivered following the standard protocol established for the delivery of online courses and programs. This program will prepare nurses to:

- Teach in a variety of academic and practice settings;
- Provide advanced nursing care to rural, urban, and underserved populations;
- Practice in collaborative and interdisciplinary relationships;
- Assume positions of leadership in the health care delivery system;
- Contribute to the current and evolving body of nursing science; and
- Continue study at the doctoral level.

The purposes of the MSN Program are:

- To increase access to graduate nursing education, especially for those nurses aspiring to teach in entry level nursing programs, manage professional practice work settings, and practice as advanced clinicians in a changing health care delivery system.
- To maximize the effective use of technology for delivery of graduate-level instruction. Distance delivery through the use of technology will increase access to graduate education, especially in remote areas of the state and for practicing nurses for whom time flexibility is a critical resource.
- To provide student access to web-based courses and degree programs. Web-based courses will reach populations not currently enrolled in graduate education, and will also permit students who are currently enrolled in on-campus courses to take additional courses, thus completing their programs sooner.

Admission Requirements Master's and Certificate Programs

- Applicant must possess and maintain an unencumbered license to practice as a Registered Nurse in Tennessee or the state in which the clinical assignments are completed.
- An earned Bachelor's degree with an overall GPA of 3.0 on a 4.0 scale.
- Official transcripts from previously attended colleges and/or universities.
- Successful completion of a 3 semester hour or quarter hour undergraduate level Statistics course.
 - For provisional standing admission:
 - an overall undergraduate quality point average of 2.75 - 2.99 on a 4.0 scale, upon completion of a baccalaureate degree program
- Cumulative GPA of 3.0 on a 4.0 scale for all previous graduate studies.
- TOEFL score of 600 (250 CBT) if native language is not English OR IELTS score of 6.0.

- A written document prepared by the applicant that includes a resume, a discussion of prior professional experience, future career goals, and reasons for pursuing graduate study.
- Letters of recommendations from at least three (3) persons (a minimum of one [1] academic) familiar with the applicant's academic and professional background and experience in nursing practice, specifying in detail the applicant's capabilities for graduate study and for future practice as an advanced practice nurse.

Admissions - DNP

Admission requirements for the joint DNP program are as follows:

- a completed application with payment of nonrefundable application fee;
- official transcripts of all previous undergraduate and graduate coursework
- a written essay.

There are different levels of admission depending upon prior credentials of applicants and whether or not they hold a BSN, MSN, or a BSN and a master's in another discipline. Additional requirements for admission to the DNP program include:

1. BSN-DNP applicants:
 1. A bachelor's degree in nursing is required;
 2. For international applicants, a bachelor's degree in nursing or equivalency (for BSN to DNP applicants), or a non-nursing master's degree or equivalency (for MSN to DNP applicants) from a nationally accredited nursing program or comparably recognized non-U.S. institution, with a cumulative grade point average of at least 3.0 on a 4-point scale;
2. MSN-DNP applicants (4 options)
 1. Certification in the selected nursing specialty for the concentration.
For example: Certified FNP for FNP concentration, Certified WHNP in the WHNP concentration, etc.;
OR
 2. Master's in Nursing in a specialty different than the intended concentrations (WHNP, PNP, ACNP, PMHNP, FNP, Executive Leadership) will require a longer program of study adapted to the previous Master's specialty and nursing experience;
OR
 3. Non-nursing master's with a BSN from a nationally accredited nursing program will require a longer program of study adapted to the previous Master's specialty and nursing experience;
OR
 4. For the General (No Concentration) MSN-DNP, Master's in Nursing with advanced practice registered nurse (APRN) certification (Nurse Practitioner, Clinical Nurse Specialist, Nurse Midwife, or Nurse Anesthetist) or master's level nursing administration/ healthcare systems leadership concentration;
 5. NOTE: All four MSN options for the Executive Leadership in Nursing concentration require at least one year of experience in a nursing administration role.
3. All applicants with a cumulative GPA less than 3.2 as reported by their BSN or MSN institution will be required to take the Graduate Record Exam (GRE);
4. Licensure as a Registered Nurse in the United States and eligibility for licensure in Tennessee or equivalency for international students;
5. All applicants are required to have at least two years of full-time work experience (or equivalent) in nursing as a registered nurse;
6. Three letters of recommendation are required: one from the applicant's current (most recent) supervisor, one from a faculty member who has worked directly with the applicant during previous academic study, and one from an individual selected by the applicant;
7. All applicants will participate in an interview;
8. All applicants will be required to complete a writing sample at the time of the interview describing a problem the applicant has identified in practice that the applicant might explore in the DNP program;
9. All applicants must submit a cover letter expressing the applicant's personal goals for doctoral study; and
10. All applicants must submit a current resume or vita.

The completed application form and fee, official transcripts of all previous undergraduate and graduate work, essay, documentation of nursing licensure in the United States, MSN certification(where applicable), letters of recommendation and resume or vita must be submitted to the ETSU School of Graduate Studies or the TTU Graduate College, depending upon the applicant's home school. International students must also forward the additionally required documentation to the appropriate home school.

The personal interview and time for completing the writing sample will be scheduled by the Joint DNP Admissions Committee. Factors given consideration in the admission decision include: previous grade point average (GPA), clarity of the applicant's selected problem as stated in the writing sample and during the interview, writing ability, professional work experience and achievements, professional honors and awards, interest in rural and underserved population groups, and quality of references/recommendations. The Joint DNP Admissions Committee may recommend admission of a promising applicant who has not met all the admission standards on a conditional basis.

Change of Status

Students must report the following to the Dean of the Whitson-Hester School of Nursing (WHSON) within 72 hours of change of status or requirement:

1. Any adverse action taken against their RN licensure (i.e. probation, termination, suspension, limiting scope of practice, any change in activity);
2. Placement in the Tennessee Peer Assistance Program (TNPAP) or any other peer assistance program;
3. Admission to a substance abuse rehabilitation program;
4. Any legal issues that may result in a change in their ability to pass a criminal background check, including but not limited to arrests or convictions (see University's Arrest and Conviction Self-Disclosure form (link)) or change of status legal status with regards to probation or parole.

Failure to disclose to the WHSON could result in automatic dismissal from the MSN program. In addition, student must disclose the same information to preceptors and clinical agencies and provide appropriate documentation of this disclosure to WHSON.

Student Retention and Progression Criteria

Required GPA

1. Students in graduate nursing programs must meet the requirements of the College of Graduate Studies to remain in good standing. An overall grade point average (GPA) of 3.0 (B) or better must be maintained in order to graduate. Only grades of A, B and S are considered satisfactory in the graduate nursing level;
2. In addition, a graduate nursing student must achieve a grade of "B" or better in every graduate nursing course. Policies of the College of Graduate Studies for progression will apply.
3. MSN students who earn less than a "B" in a required course will have one opportunity to repeat the course. The course must be repeated at the next available opportunity. Students may only repeat two required courses. The repeated grade and the original grade will be averaged into the student's overall GP A.
4. If a student's cumulative grade point average falls below 3.0, she/he will be placed on academic probation at the end of that semester. Any graduate student placed in probationary Academic Standing at the end of a semester must return to Good Academic Standing by the end of the next enrolled semester. No student will be allowed more than two probationary semesters, whether consecutive or cumulative. At the end of a second probationary semester, a student whose cumulative grade point average is still below 3.0 will be dismissed from graduate study.
5. Students whose performance results in a GPA so far below 3.0 as to make it mathematically impossible to attain an overall GP A of 3.0 after one semester may be subject to dismissal without a probationary term.
6. An incomplete grade ("I") indicates that the student was passing the course at the end of the semester, but due to circumstances beyond the student's control, was unable to complete the course work for which the "I" is assigned. The "I" grade cannot be used to allow a student to do additional work to raise a deficient grade or to repeat a course. An "I" grade must be removed no later than one calendar year from the time the grade is awarded. Students with more than one "I" grade cannot progress in the program. Time extension requests for removal of an "I" grade must be submitted to and approved by the Dean of College of Graduate Studies before the allotted time expires. An "I" grade not removed under the guidelines in the Graduate Catalog will be converted to an "F."

Master of Science in Nursing

Nursing, Adult Geriatric Acute Care Nurse Practitioner Concentration (MSN)

The Adult Geriatric Acute Care Nurse Practitioner (ACAGNP) is a concentration in the Master of Science in Nursing (MSN) program.

General Program Information

The Doctor of Nursing Practice program offers a terminal professional degree for those who wish to pursue or further their career as an advanced practice nurse focusing on healthcare needs of specific populations. The ETSU College of Nursing and TTU School of Nursing Joint Program currently offers six concentrations within the degree: Adult/Gerontology Acute Care Nurse Practitioner, Executive Leadership, Family Nurse Practitioner, Pediatric Nurse Practitioner-Primary Care, Psychiatric/Mental Health Nurse Practitioner, and Women's Health Care Nurse Practitioner.

The focus of the Adult-Gerontology Acute Care Nurse Practitioner is to provide healthcare from adolescence to older adults in hospitals and clinic settings focusing on management of clients across acute care settings in collaboration with other members of the healthcare team. Graduates are eligible for the Adult-Gerontology Acute Care Nurse Practitioner national certification examination. Graduates are prepared for employment in varied healthcare settings.

For application terms and deadlines please refer to the Whitson-Hester School of Nursing website.

Core Courses (12 Credit Hours)

- NURS 6000 - Theoretical Foundations Cr. 3.
- NURS 6001 - Health Care Policy Cr. 3.
- NURS 6002 - Advanced Nursing Research Cr. 3.
- NURS 6003 - Advanced Role Development Cr. 3.

Advance Practice Courses (10 Credit Hours)

- NURS 6101 - Advanced Health Assessment Cr. 3.
- NURS 6102 - Advanced Health Assessment: Clinical Lab Cr. 1.
- NURS 6103 - Advanced Pathophysiology Cr. 3.
- NURS 6104 - Advanced Pharmacology Cr. 3.

AGACNP Concentration Courses (24 Credit Hours)

- NURS 5604 - ADVANCED PATHOPHYSIOLOGY AND CLINICAL REASONING FOR ACUTE DISEASE MANAGEMENT Credit 3.
- NURS 5608 - ADVANCED PATHOPHYSIOLOGY AND CLINICAL REASONING FOR ACUTE DISEASE MANAGEMENT II Credit 3.
- NURS 5610 - DIAGNOSTIC INTERPRETATION & THERAPEUTIC MODALITIES Credit 3.
- NURS 5612 - ACUTE CARE & PHARMACOTHERAPEUTICS Credit 3.
- NURS 5613 - ADVANCED PATHOPHYSIOLOGY AND CLINICAL REASONING FOR ACUTE DISEASE MANAGEMENT Practicum I Credit 2.

- NURS 5616 - INTERNSHIP IN ACUTE CARE NP PRACTICE Credit 2.
- NURS 6021 - APPLICATION OF ADVANCED SKILLS IN ACUTE CARE Credit 2.
- NURS 6023 - PALLIATIVE/ END OF LIFE CARE AND THE APN Credit 2.

Nursing, Family Nurse Practitioner Concentration, M.S.N.

The Family Nurse Practitioner (FNP) Option in the Advanced Practice Concentration of the Master's of Science in Nursing program is designed to prepare nurses to deliver primary health care to families in a variety of settings. Students follow patients through the life cycle utilizing obstetric, pediatric, gynecologic, as well as adult and geriatric primary care diagnostic and management skills.

The scope of practice of the Family Nurse Practitioner is based on a team approach. An interdependent member of the health team, the FNP provides primary care through the following means:

- Documentation of individual and family health history
- Physical assessment
- Diagnostic, therapeutic, and educational care plans
- Collaboration with physicians and other health care professionals
- Referral to appropriate health care providers
- Coordination of health care

Graduates are eligible to take the certifying examination offered by the American Nurses Association and the American Academy of Nurse Practitioners. Graduates find positions in a variety of settings such as outpatient clinics, community health centers, private practice offices, health departments, homeless shelters, chronic care facilities, schools, day care programs, hospices, homes, and acute care settings.

Since opening the MSN, a number of master's prepared nurses have indicated an interest in completing the Family Nurse Practitioner Concentration courses in order to sit for the national certification exam to practice as a Family Nurse Practitioner. In order to be eligible to take the certification exam, students must "successfully complete graduate didactic and clinical requirements of a master's nurse practitioner program through a formal graduate-level certificate or master's level NP program in the desired area of practice." Establishment of the FNP Certificate program offers a formal program of study to meet this need for students without requiring them to complete a second master's degree.

Constant change in the health system challenges the notion that one nurse can be all things to all people. Nurses with varied education and practice competencies bring different skills to patient care, and they must be able to practice to the fullest potential of these capabilities. To compete as attractive professional destinations, practice environments must recognize and reward these differences by defining nurses' roles, and by utilizing and compensating nurses according to their different educational preparation and competencies. Nurses prepared at the master's level in a variety of advanced practice roles are needed to meet patient needs in a changing health care environment.

The Family Nurse Practitioner (FNP) concentration is an online Master of Science program with two residency experiences. The residency experiences will allow students to connect with faculty and peers as they receive experiential learning opportunities in the nursing lab. These residency components are requirements of the program and will be associated in the following courses:

NURS 6615 Primary Care of the Family: Practicum 1 day, on-campus residency requirement

NURS 6616 Final FNP Preceptorship Final FNP Preceptorship 1 day, on-campus residency requirement

Degree Requirements

- Follow the Graduate School Grading System as published in the TTU Graduate School Catalog. (NOTE: only grades of A, B, and S are considered satisfactory at the graduate nursing level.)
- Required GPA:
 1. Students in graduate nursing programs must meet the requirements of the School of Graduate Studies to remain in good standing. An overall grade point average (GPA) of 3.0 (B) or better must be maintained in order to graduate. Only grades of A, B and S are considered satisfactory in the graduate nursing level;
 2. In addition, a graduate nursing student must achieve a grade of "B" or better in every graduate nursing course. Policies of the School of Graduate Studies for progression will apply.
 3. MSN students who earn less than a "B" in a required course will have one opportunity to repeat the course. The course must be repeated at the next available opportunity. Students may only repeat two required courses. The repeated grade and the original grade will be averaged into the student's overall GPA.
 4. If a student's cumulative grade point average falls below 3.0, she/he will be placed on academic probation at the end of that semester. Any graduate student placed in probationary Academic Standing at the end of a semester must return to Good Academic Standing by the end of the next enrolled semester. No student will be allowed more than two probationary semesters, whether consecutive or cumulative. At the end of a second probationary semester, a student whose cumulative grade point average is still below 3.0 will be dismissed from graduate study.
 5. Students whose performance results in a GPA so far below 3.0 as to make it mathematically impossible to attain an overall GP A of 3 .0 after one semester may be subject to dismissal without a probationary term.
 6. An incomplete grade ("I") indicates that the student was passing the course at the end of the semester, but due to circumstances beyond the student's control, was unable to complete the course work for which the "I" is assigned. The "I" grade cannot be used to allow a student to do additional work to raise a deficient grade or to repeat a course. An "I" grade must be removed no later than one calendar year from the time the grade is awarded. Students with more than one "I" grade cannot progress in the program. Time extension requests for removal of an "I" grade must be submitted to and approved by the Dean of College of Graduate Studies before the allotted time expires. An "I" grade not removed under the guidelines in the Graduate Catalog will be converted to an "F."

ADN or Diploma Graduate with a Bachelor's Degree in another Discipline Accelerated Option

The following pathway is provided allowing a registered nurse with a bachelor's degree in another field to complete their Master's in Nursing degree:

- NURS 4350 (5350) - Healthcare of Communities Cr. 4.
- NURS 6000 - Theoretical Foundations Cr. 3.
- NURS 6001 - Health Care Policy Cr. 3.
- NURS 6002 - Advanced Nursing Research Cr. 3.
- NURS 6003 - Advanced Role Development Cr. 3.

BSN to MSN Degree Requirements

- **MSN Core Courses:** 14 hours
- **Advanced Practice Concentration Required Courses:** 10 hours
- **Required Concentration Courses:** 22 hours
- **Total:** 46 hours

MSN Core Courses (14 hours)

- NURS 6000 - Theoretical Foundations Cr. 3.
- NURS 6001 - Health Care Policy Cr. 3.
- NURS 6002 - Advanced Nursing Research Cr. 3.
- NURS 6003 - Advanced Role Development Cr. 3.
- NURS 6910 - Role Transition to Certification and Practice Cr. 2

Family Nurse Practitioner Concentration

Advanced Practice Concentration Required Courses (10 hours)

- NURS 6101 - Advanced Health Assessment Cr. 3.
OR
- NURS 5009 - Health Assessment Throughout the Lifespan Cr. 3.
- NURS 6102 - Advanced Health Assessment: Clinical Lab Cr. 1.
- NURS 6103 - Advanced Pathophysiology Cr. 3.
- NURS 6104 - Advanced Pharmacology Cr. 3.

Required Concentration Courses (22 hours)

- NURS 6610 - Adult Health Primary Care I Cr. 3.
- NURS 6611 - Adult Health Primary Care I Practicum Cr. 3.
- NURS 6612 - Adult Health Primary Care II Cr. 3.
- NURS 6613 - Adult Health Primary Care II Practicum Cr. 3.
- NURS 6614 - Primary Care Pediatrics & Women's Health Cr. 3.
- NURS 6615 - Primary Care of the Family: Practicum Credit 3.
- NURS 6616 - Final FNP Preceptorship Cr. 3.

Total practice contact hours = 540

Nursing, Nursing Administration Concentration, M.S.N.

Degree Requirements

- Follow the Graduate School Grading System as published in the TTU Graduate School Catalog. (NOTE: only grades of A, B, and S are considered satisfactory at the graduate nursing level.)
- Required GPA:
 1. Students in graduate nursing programs must meet the requirements of the School of Graduate Studies to remain in good standing. An overall grade point average (GPA) of 3.0 (B) or better must be maintained in order to graduate. Only grades of A, B and S are considered satisfactory in the graduate nursing level;
 2. In addition, a graduate nursing student must achieve a grade of "B" or better in every graduate nursing course. Policies of the School of Graduate Studies for progression will apply.
 3. MSN students who earn less than a "B" in a required course will have one opportunity to repeat the course. The course must be repeated at the next available opportunity. Students may only repeat two required courses. The repeated grade and the original grade will be averaged into the student's overall GPA.
 4. If a student's cumulative grade point average falls below 3.0, she/he will be placed on academic probation at the end of that semester. Any graduate student placed in probationary Academic Standing at the end of a semester must return to Good Academic Standing by the end of the next enrolled semester. No student will be allowed more than two probationary semesters, whether consecutive or cumulative. At the end of a second probationary semester, a student whose cumulative grade point average is still below 3.0 will be dismissed from graduate study.
 5. Students whose performance results in a GPA so far below 3.0 as to make it mathematically impossible to attain an overall GP A of 3 .0 after one semester may be subject to dismissal without a probationary term.
 6. An incomplete grade ("I") indicates that the student was passing the course at the end of the semester, but due to circumstances beyond the student's control, was unable to complete the course work for which the "I" is assigned. The "I" grade cannot be used to allow a student to do additional work to raise a deficient grade or to repeat a course. An "I" grade must be removed no later than one calendar year from the time the grade is awarded. Students with more than one "I" grade cannot progress in the program. Time extension requests for removal of an "I" grade must be submitted to and approved by the Dean of College of Graduate Studies before the allotted time expires. An "I" grade not removed under the guidelines in the Graduate Catalog will be converted to an "F."

ADN or Diploma Graduate with a Bachelor's Degree in another Discipline Accelerated Option

The following pathway is provided allowing a registered nurse with a bachelor's degree in another field to complete their Master's in Nursing degree:

- NURS 4350 (5350) - Healthcare of Communities Cr. 4.
- NURS 6000 - Theoretical Foundations Cr. 3.
- NURS 6001 - Health Care Policy Cr. 3.
- NURS 6002 - Advanced Nursing Research Cr. 3.
- NURS 6003 - Advanced Role Development Cr. 3.

BSN to MSN Degree Requirements

- **MSN Core:** 15 hours
- **Concentration Core:** 15 hours
- **Practicum:** 6 hours
- **Total:** 36 hours

MSN Core Courses (15 hours)

- NURS 6000 - Theoretical Foundations Cr. 3.
- NURS 6001 - Health Care Policy Cr. 3.
- NURS 6002 - Advanced Nursing Research Cr. 3.
- NURS 6003 - Advanced Role Development Cr. 3.
- NURS 6990 - Scholarly Synthesis Cr. 3.

Nursing Administration Concentration

Required Courses (15 hours)

- NURS 6301 - Nursing Administration I Cr. 3.
- NURS 6302 - Nursing Administration II Cr. 3.
- NURS 6303 - Health Care Finance Cr. 3.
- NURS 6304 - Human Resources Management Cr. 3.
- NURS 6305 - Quality Management in Nursing and Health Care Cr. 3.

Practicum Requirement (6 hours)

- NURS 6309 - Nursing Administration Practicum Cr. 4.
- NURS 6307 - Nursing Management Practicum Cr. 2.

Total practice contact hours = 360

Nursing, Nursing Education Concentration, M.S.N.

Degree Requirements

- Follow the Graduate School Grading System as published in the TTU Graduate School Catalog. (NOTE: only grades of A, B, and S are considered satisfactory at the graduate nursing level.)
- Required GPA:
 - 1. Students in graduate nursing programs must meet the requirements of the School of Graduate Studies to remain in good standing. An overall grade point average (GPA) of 3.0 (B) or better must be maintained in order to graduate. Only grades of A, B and S are considered satisfactory in the graduate nursing level;

- 2. In addition, a graduate nursing student must achieve a grade of "B" or better in every graduate nursing course. Policies of the School of Graduate Studies for progression will apply.
- 3. MSN students who earn less than a "B" in a required course will have one opportunity to repeat the course. The course must be repeated at the next available opportunity. Students may only repeat two required courses. The repeated grade and the original grade will be averaged into the student's overall GPA.
- 4. If a student's cumulative grade point average falls below 3.0, she/he will be placed on academic probation at the end of that semester. Any graduate student placed in probationary Academic Standing at the end of a semester must return to Good Academic Standing by the end of the next enrolled semester. No student will be allowed more than two probationary semesters, whether consecutive or cumulative. At the end of a second probationary semester, a student whose cumulative grade point average is still below 3.0 will be dismissed from graduate study.
- 5. Students whose performance results in a GPA so far below 3.0 as to make it mathematically impossible to attain an overall GP A of 3 .0 after one semester may be subject to dismissal without a probationary term.
- 6. An incomplete grade ("I") indicates that the student was passing the course at the end of the semester, but due to circumstances beyond the student's control, was unable to complete the course work for which the "I" is assigned. The "I" grade cannot be used to allow a student to do additional work to raise a deficient grade or to repeat a course. An "I" grade must be removed no later than one calendar year from the time the grade is awarded. Students with more than one "I" grade cannot progress in the program. Time extension requests for removal of an "I" grade must be submitted to and approved by the Dean of College of Graduate Studies before the allotted time expires. An "I" grade not removed under the guidelines in the Graduate Catalog will be converted to an "F."

ADN or Diploma Graduate with a Bachelor's Degree in another Discipline Accelerated Option

The following pathway is provided allowing a registered nurse with a bachelor's degree in another field to complete their Master's in Nursing degree:

- NURS 4350 (5350) - Healthcare of Communities Cr. 4.
- NURS 6000 - Theoretical Foundations Cr. 3.
- NURS 6001 - Health Care Policy Cr. 3.
- NURS 6002 - Advanced Nursing Research Cr. 3.
- NURS 6003 - Advanced Role Development Cr. 3.

BSN to MSN Degree Requirements

- **MSN Core Courses:** 15 hours
- **Required Concentration Core:** 16 hours
- **Practicum Requirement:** 6 hours
- **Total:** 40 hours

MSN Core Courses (15 hours)

- NURS 6000 - Theoretical Foundations Cr. 3.
- NURS 6001 - Health Care Policy Cr. 3.
- NURS 6002 - Advanced Nursing Research Cr. 3.
- NURS 6003 - Advanced Role Development Cr. 3.
- NURS 6990 - Scholarly Synthesis Cr. 3.

Nursing Education Concentration

Required Concentration Core (19 hours)

- NURS 6101 - Advanced Health Assessment Cr. 3.
OR
- NURS 5009 - Health Assessment Throughout the Lifespan Cr. 3.
- NURS 6103 - Advanced Pathophysiology Cr. 3.
- NURS 6104 - Advanced Pharmacology Cr. 3.
- NURS 6204 - Curriculum Design & Education Theory Cr. 3.
- NURS 6205 - Evaluation Methods in Nursing Education Cr. 2.
- NURS 6210 - Innovative Teaching Strategies Cr. 2.
- NURS 6211 - Trends in Healthcare Management Cr. 2.
- NURS 6212 - Preparation for Certification Cr. 1.

Practicum Requirement (6 hours)

- NURS 6207 - Clinical Focus Practicum Cr. 2.
- NURS 6209 - Nursing Education Practicum Cr. 4.

Total practice contact hours = 360

Clinical Focus Practicum = 120

Nursing Education Practicum = 240

*Students choosing the nursing education concentration who desire to take national certification exams for the Clinical Nurse Specialist (CNS) will also need to meet requirements in the CNS option.

Nursing, Psychiatric Mental Health Nurse Practitioner Concentration M.S.N.

Each year 1 in 4 in the United States people will experience mental illness. Those who receive mental health services report improvements in both symptoms and in quality of life, but an alarming number of both children and adults are not receiving this care. There is a growing shortage of mental health providers nationwide and the need for adequate mental health services presents an opportunity for nurses to expand their practice to meet this need.

To address the increasing demand for mental services and providers throughout our state, nation and region, we are offering a Master of Science in Nursing – Psychiatric Mental Health Nurse Practitioner concentration. This

concentration prepares graduates to promote mental health and to diagnose and treat mental illnesses in a variety of settings. This degree qualifies graduates to test for certification in this specialty and to then pursue licensure in their respective states as an Advanced Practice Registered Nurse.

Degree Requirements

- Follow the Graduate School Grading System as published in the TTU Graduate School Catalog. (NOTE: only grades of A, B, and S are considered satisfactory at the graduate nursing level.)
- Required GPA:
 - 1. Students in graduate nursing programs must meet the requirements of the School of Graduate Studies to remain in good standing. An overall grade point average (GPA) of 3.0 (B) or better must be maintained in order to graduate. Only grades of A, B and S are considered satisfactory in the graduate nursing level;
 - 2. In addition, a graduate nursing student must achieve a grade of "B" or better in every graduate nursing course. Policies of the School of Graduate Studies for progression will apply.
 - 3. MSN students who earn less than a "B" in a required course will have one opportunity to repeat the course. The course must be repeated at the next available opportunity. Students may only repeat two required courses. The repeated grade and the original grade will be averaged into the student's overall GPA.
 - 4. If a student's cumulative grade point average falls below 3.0, she/he will be placed on academic probation at the end of that semester. Any graduate student placed in probationary Academic Standing at the end of a semester must return to Good Academic Standing by the end of the next enrolled semester. No student will be allowed more than two probationary semesters, whether consecutive or cumulative. At the end of a second probationary semester, a student whose cumulative grade point average is still below 3.0 will be dismissed from graduate study.
 - 5. Students whose performance results in a GPA so far below 3.0 as to make it mathematically impossible to attain an overall GP A of 3 .0 after one semester may be subject to dismissal without a probationary term.
 - 6. An incomplete grade ("I") indicates that the student was passing the course at the end of the semester, but due to circumstances beyond the student's control, was unable to complete the course work for which the "I" is assigned. The "I" grade cannot be used to allow a student to do additional work to raise a deficient grade or to repeat a course. An "I" grade must be removed no later than one calendar year from the time the grade is awarded. Students with more than one "I" grade cannot progress in the program. Time extension requests for removal of an "I" grade must be submitted to and approved by the Dean of College of Graduate Studies before the allotted time expires. An "I" grade not removed under the guidelines in the Graduate Catalog will be converted to an "F."

ADN or Diploma Graduate with a Bachelor's Degree in another Discipline Accelerated Option

The following pathway is provided allowing a registered nurse with a bachelor's degree in another field to complete their Master's in Nursing degree:

- NURS 4350 (5350) - Healthcare of Communities Cr. 4.
- NURS 6000 - Theoretical Foundations Cr. 3.

- NURS 6001 - Health Care Policy Cr. 3.
- NURS 6002 - Advanced Nursing Research Cr. 3.
- NURS 6003 - Advanced Role Development Cr. 3.

BSN to MSN Degree Requirements

- **MSN Core Courses:** 14 hours
- **Advance Practice Courses:** 10 hours
- **Required Concentration Courses:** 21 hours
- **Total:** 45 hours

MSN Core Courses (14 hours)

- NURS 6000 - Theoretical Foundations Cr. 3.
- NURS 6001 - Health Care Policy Cr. 3.
- NURS 6002 - Advanced Nursing Research Cr. 3.
- NURS 6003 - Advanced Role Development Cr. 3.
- NURS 6911 - Role Transition to Certification and Practice for the Psychiatric Mental Health Nursing Practitioner Cr. 2.

Psychiatric Mental Health Nurse Practitioner Concentration

Advance Practice Courses (10 hours)

- NURS 6101 - Advanced Health Assessment Cr. 3.
- NURS 6102 - Advanced Health Assessment: Clinical Lab Cr. 1.
- NURS 6103 - Advanced Pathophysiology Cr. 3.
- NURS 6104 - Advanced Pharmacology Cr. 3.

Required Concentration Courses (21 hours)

- NURS 6710 - Advanced Family Psychiatric Nursing I Cr. 3.
- NURS 6711 - Advanced Family Psychiatric Nursing I: Practicum Cr. 3.
- NURS 6712 - Advanced Family Psychiatric Nursing II Cr. 3.
- NURS 6713 - Advanced Family Psychiatric Nursing II: Practicum Cr. 3.
- NURS 6714 - Advanced Family Psychiatric Nursing III Cr. 3.
- NURS 6715 - Advanced Family Psychiatric Nursing III: Practicum Cr. 3.
- NURS 6716 - Final Psychiatric Nursing Preceptorship Cr. 3.

Doctor of Nursing Practice

Nursing - DNP (Joint Program with ETSU)

Nursing Program Information

Concentrations

The following concentrations are available in the Nursing DNP degree program:

- Nursing, Adult-Gerontology Acute Care Nurse Practitioner Concentration, DNP (TTU-ETSU)
- Nursing, Nursing and Healthcare Leadership, DNP (TTU-ETSU)
- Nursing, Family Nurse Practitioner Concentration, DNP (TTU-ETSU)
- Nursing, Pediatric Nurse Practitioner-Primary Care Concentration, DNP (TTU-ETSU)
- Nursing, Psychiatric/Mental Health Nurse Practitioner Concentration, DNP (TTU-ETSU)
- Nursing, Women's Health Care Nurse Practitioner Concentration, DNP (TTU-ETSU)

Nursing, Adult-Gerontology Acute Care Nurse Practitioner Concentration, DNP (TTU-ETSU)

Adult-Gerontology Acute Care Nurse Practitioner Program Information (DNP)

BSN-DNP Degree Requirements (75 hours)

- **Core Requirements:** 35 hours
- **Concentration:** 28 hours
- **DNP Project:** 12 hours
- **Total:** 75 hours

BSN-DNP Core Requirements (35 hours)

- NRSE 5000 - Conceptual Systems for Advanced Nursing Practice Cr. 3.
- NRSE 5001 - Nursing Research for Evidence-Based Practice Cr. 3.
- NRSE 5006 - Advanced Role Development Cr. 3.
- NRSE 5009 - Health Assessment Throughout the Lifespan Cr. 3.
- NRSE 5010 - Health Assessment Throughout the Lifespan Practicum Cr. 3.
- NRSE 5016 - Advanced Pathophysiology Cr. 3.
- NRSE 5018 - Advanced Clinical Pharmacology Cr. 3.
- NRSE 5030 - Scholarly Writing Cr. 1.
- NRSE 5100 - Principles of Population Health & Data Analysis for Advanced Nursing Practice Cr. 4.
- NRSE 6002 - Health Policy Leadership Cr. 3.
- NRSE 6050 - Quality/Translation Cr. 3.
- NRSE 6713 - Systems Management Cr. 3.

BSN-DNP Concentration Requirements (28 hours)

- NRSE 5604 - Advanced Pathophysiology & Clinical Reasoning for Acute Disease Management I Cr. 3.
- NRSE 5608 - Advanced Pathophysiology & Clinical Reasoning for Acute Disease Management II Cr. 3.
- NRSE 5610 - Diagnostic Interpretation and Therapeutic Modalities Cr. 3.

- NRSE 5612 - ACUTE CARE & PHARMACOTHERAPEUTICS Credit 3.
- NRSE 5613 - ADVANCED PATHOPHYSIOLOGY AND CLINICAL REASONING FOR ACUTE DISEASE MANAGEMENT Practicum 1 Credit 2.
- NRSE 5614 - ADVANCED PATHOPHYSIOLOGY & CLINICAL REASONING FOR ACUTE CARE MANAGEMENT PRACTICUM II Credit 2.
- NRSE 5617 - Diagnostic Interpretation & Therapeutic Modalities Practicum Credit 2.
- NRSE 6021 - Application of Advanced Skills in Acute Care Credit 2.
- NRSE 6022 - Strategic Planning for Health Care Credit 2.
- NRSE 6023 - Palliative/End of Life Care and the APN Credit 2.

DNP Project (12 hours)

- NRSE 6801 - Residency I DNP Project Identification Cr. 3.
- NRSE 6802 - DNP Project Development Cr. 3.
- NRSE 6803 - DNP Project Implementation Cr. 3.
- NRSE 6804 - DNP Project Analysis and Dissemination Cr. 3.

MSN-DNP Degree Requirements (31 hours)*

- **Core Requirements:** 11 hours
- **Concentration:** 8 hours
- **DNP Project:** 12 hours
- **Total:** 35 hours

*If you are a MSN to DNP student and you are changing your specialization, your transcript will be evaluated and you will receive an individualized program of study from the Graduate Programs Coordinator to include 5000 level courses that you will need for certification.

MSN-DNP Core Requirements (11 hours)

- NRSE 5030 - Scholarly Writing Cr. 1.
- NRSE 5100 - Principles of Population Health & Data Analysis for Advanced Nursing Practice Cr. 4.
- NRSE 6050 - Quality/Translation Cr. 3.
- NRSE 6713 - Systems Management Cr. 3.

MSN-DNP Concentration Requirements (8 hours)

- NRSE 6022 - Strategic Planning for Health Care Credit 2.
- NRSE 6023 - Palliative/End of Life Care and the APN Credit 2.

DNP Project (12 hours)

- NRSE 6801 - Residency I DNP Project Identification Cr. 3.
- NRSE 6802 - DNP Project Development Cr. 3.
- NRSE 6803 - DNP Project Implementation Cr. 3.

- NRSE 6804 - DNP Project Analysis and Dissemination Cr. 3.

Nursing, Family Nurse Practitioner Concentration, DNP (TTU-ETSU)

Family Nurse Practitioner DNP Program Information

General Degree Information

The Doctor of Nursing Practice program offers a terminal professional degree for those who wish to pursue or further their career as an advanced practice nurse focusing on healthcare needs of specific populations. The College of Nursing currently offers four concentrations within the degree: Adult/Gerontology Primary Care Nurse Practitioner, Executive Leadership, Family Nurse Practitioner, and Psychiatric/Mental Health Nurse Practitioner.

The focus of the Family Nurse Practitioner concentration is patient centered quality care including common and acute illnesses while emphasizing quality of care and health outcomes. The patient population for this concentration is across the lifespan. Graduates will be eligible for the Family Nurse Practitioner National Certification examination. The Family Nurse Practitioner works in collaboration with other members of the healthcare team. Graduates are prepared for employment in varied healthcare settings.

Total Program of Study Credit Hours - Family Nurse Practitioner

- **Core Courses:** 23 hours
- **Concentration Courses:** 48 hours
- **DNP Project:** 12 hours
- **TOTAL Program Credit Hours: Family Nurse Practitioner:** 83 hours

BSN-DNP Degree Requirements (83 hours)

- **Core Requirements:** 35 hours
- **Concentration:** 36 hours
- **DNP Project:** 12 hours
- **TOTAL:** 83 hours

BSN-DNP Core Requirements (35 hours)

- NRSE 5000 - Conceptual Systems for Advanced Nursing Practice Cr. 3.
- NRSE 5001 - Nursing Research for Evidence-Based Practice Cr. 3.
- NRSE 5006 - Advanced Role Development Cr. 3.
- NRSE 5009 - Health Assessment Throughout the Lifespan Cr. 3.
- NRSE 5010 - Health Assessment Throughout the Lifespan Practicum Cr. 3.
- NRSE 5016 - Advanced Pathophysiology Cr. 3.
- NRSE 5018 - Advanced Clinical Pharmacology Cr. 3.
- NRSE 5030 - Scholarly Writing Cr. 1.
- NRSE 5100 - Principles of Population Health & Data Analysis for Advanced Nursing Practice Cr. 4.
- NRSE 6002 - Health Policy Leadership Cr. 3.
- NRSE 6050 - Quality/Translation Cr. 3.
- NRSE 6713 - Systems Management Cr. 3.

BSN-DNP Concentration Requirements (35 hours)

- NRSE 5011 - Health Promotion, Diagnosis, Treatment, and Clinical Management: Nurse Practitioner I Cr. 3.
- NRSE 5012 - Health Promotion, Diagnosis, Treatment, and Clinical Management: Nurse Practitioner I Practicum Cr. 3.
- NRSE 5013 - Health Promotion, Diagnosis, Treatment, and Clinical Management: Nurse Practitioner II Cr. 3.
- NRSE 5014 - Health Promotion, Diagnosis, & Clinical Management of Older Adults Practicum Cr. 3.
- NRSE 5021 - Lifespan Assessment and Clinical Management: Women's Health Cr. 2.
- NRSE 5022 - Lifespan Assessment and Clinical Management: Women's Health Practicum Cr. 3.
- NRSE 5023 - Health Promotion and Clinical Management of Children and Adolescents Cr. 3.
- NRSE 5024 - Health Promotion, Diagnosis and Clinical Management of Children and Adolescents Practicum Cr. 3.
- NRSE 6400 - Improving Mental Health Outcomes in Primary Care Cr. 3.
- NRSE 6613 - Advanced Nursing of Rural/Underserved Populations Cr. 3.
- NRSE 6614 - Advanced Intervention DNP Practice Cr. 3.
- Advisor Approved Elective Cr. 3.

DNP Project (12 hours)

- NRSE 6801 - Residency I DNP Project Identification Cr. 3.
- NRSE 6802 - DNP Project Development Cr. 3.
- NRSE 6803 - DNP Project Implementation Cr. 3.
- NRSE 6804 - DNP Project Analysis and Dissemination Cr. 3.

MSN-DNP Degree Requirements (32 hours)

- **Core Requirements:** 11 hours
- **Concentrations:** 9 hours
- **DNP Project:** 12 hours
- **TOTAL:** 32 hours*

*If you are a MSN to DNP student and you are changing your specialization, your transcript will be evaluated and you will receive an individualized program of study from the Graduate Programs Coordinator to include 5000 level courses that you will need for certification.

MSN-DNP Core Requirements (11 hours)

- NRSE 5030 - Scholarly Writing Cr. 1.
- NRSE 5100 - Principles of Population Health & Data Analysis for Advanced Nursing Practice Cr. 4.
- NRSE 6050 - Quality/Translation Cr. 3.
- NRSE 6713 - Systems Management Cr. 3.

MSN-DNP Concentration Requirements (9 hours)

- NRSE 6613 - Advanced Nursing of Rural/Underserved Populations Cr. 3.
- NRSE 6614 - Advanced Intervention DNP Practice Cr. 3.
- Advisor Approved Elective Cr. 3.

DNP Project (12 hours)

- NRSE 6801 - Residency I DNP Project Identification Cr. 3.
- NRSE 6802 - DNP Project Development Cr. 3.
- NRSE 6803 - DNP Project Implementation Cr. 3.
- NRSE 6804 - DNP Project Analysis and Dissemination Cr. 3.

Nursing, Nursing and Healthcare Leadership, DNP (TTU-ETSU)

Nursing and Healthcare Leadership Program Information

Degree Admissions Requirements

Applicants seeking admission to the DNP program must fulfill all requirements for admission to the Graduate College.

There are different levels of admission depending upon prior credentials of applicants and whether or not they hold a BSN, MSN, or a BSN and a master's in another discipline. Additional requirements for admission to the DNP program include:

1. BSN-DNP applicants:

- A bachelor's degree in nursing is required;
- For international applicants, a bachelor's degree in nursing or equivalency (for BSN to DNP applicants), or a non-nursing master's degree or equivalency (for MSN to DNP applicants) from a nationally accredited nursing program or comparably recognized non-U.S. institution, with a cumulative grade point average of at least 3.0 on a 4-point scale;
- BSN and a Masters in a non-nursing field (MBA, MPH, MHA, MMCH, etc.) or MSN in a non-nursing administration concentration.

Note: Students with a masters in a content area other than nursing will start with a MSN-DNP program plan but additions in coursework in the following areas: Leadership, Finance, Quality Improvement, clinical hours, and other content areas based on the transcript review may be required. Coursework must be at the graduate level.

2. MSN-DNP applicants:

- A completed MS in Nursing (MSN) with a concentration in Nursing Administration or equivalent.

3. Unencumbered licensure as a Registered Nurse in the United States and eligibility for licensure in Tennessee or equivalency for international students;

4. Three professional letters of recommendation are required.

5. All applicants will participate in an interview;

6. All applicants will be required to complete a personal statement with the application addressing why you want to go to graduate school and why this program would be a good fit with your career goals. The personal statement must also address the following questions: What current trend(s) in healthcare do you find the most concerning or compelling? What in our education and/or professional practice has prepared you to address the identified trend(s)? How do you think you will be able to impact the trend(s) you identified, in your new role when you have completed your graduate study? Use at least two scholarly references and write the essay in American Psychological Associate (APA) format. The writing must be your own work; and
7. A current resume or vita.

The completed application form and fee, transcripts of all previous undergraduate and graduate work, essay, documentation of nursing licensure in the United States, MSN certification (where applicable), letters of recommendation and resume or vita must be submitted through the online application portal to the ETSU College of Graduate and Continuing Studies or the TTU Graduate College, depending upon the applicant's choice. International students must also upload the additionally required documentation to the appropriate school.

Factors given consideration in the admission decision include: previous grade point average (GPA), clarity of the applicant's selected problem as stated in the writing sample and during the interview, writing ability, professional work experience and achievements, professional honors and awards, interest in rural and under-served population groups, and quality of references/recommendations. The ETSU-TTU DNP Program Admission Committee may recommend admission to a promising applicant who has not met all the admission standards on a conditional or provisional basis.

BSN-DNP Degree Requirements (77 hours)

- **Core Requirements:** 23 hours
- **Concentration:** 42 hours
- **DNP Project:** 12 hours
- **TOTAL:** 77 hours

BSN-DNP Core Requirements (23 hours)

- NRSE 5000 - Conceptual Systems for Advanced Nursing Practice Cr. 3.
- NRSE 5001 - Nursing Research for Evidence-Based Practice Cr. 3.
- NRSE 5006 - Advanced Role Development Cr. 3.
- NRSE 5030 - Scholarly Writing Cr. 1.
- NRSE 5100 - Principles of Population Health & Data Analysis for Advanced Nursing Practice Cr. 4.
- NRSE 6002 - Health Policy Leadership Cr. 3.
- NRSE 6050 - Quality/Translation Cr. 3.
- NRSE 6713 - Systems Management Cr. 3.

BSN-DNP Concentration Requirements (42 hours)

- NRSE 5501 - Leadership in Nursing Administration Cr. 1.
- NRSE 5502 - Executive Leadership Practicum I Cr. 3.
- NRSE 5503 - Executive Leadership Practicum II Cr. 3.
- NRSE 5504 - Executive Leadership Practicum III Cr. 3.
- NRSE 5510 - Organizational Theory and Nursing Administration Cr. 3.
- NRSE 5520 - Fiscal Management in Nursing Administration Cr. 3.

- NRSE 5530 - Health Care Organizations & Law Cr. 3.
- NRSE 5550 - Human Resource Management in Health Organizations Cr. 3.
- NRSE 5580 - Project Management of Nurse Leaders Cr. 3.
- NRSE 6513 - Case Management Cr. 3.
- NRSE 6712 - Strategic Fiscal Management Cr. 3.
- NRSE 6714 - Executive Leadership Cr. 3.
- NRSE 6715 - Contemporary Problems in Executive Leadership in Nursing Cr. 3.

DNP Project (12 hours)

- NRSE 6801 - Residency I DNP Project Identification Cr. 3.
- NRSE 6802 - DNP Project Development Cr. 3.
- NRSE 6803 - DNP Project Implementation Cr. 3.
- NRSE 6804 - DNP Project Analysis and Dissemination Cr. 3.

MSN-DNP Degree Requirements (32 hours)

- **Core Requirements:** 11 hours
- **Concentration:** 9 hours
- **DNP Project:** 12 hours
- **TOTAL:** 32 hours*

*If you are a MSN to DNP student and you are changing your specialization, your transcript will be evaluated and you will receive an individualized program of study from the Graduate Programs Coordinator to include 5000 level courses that you will need for certification.

MSN-DNP Core Requirements (11 hours)

- NRSE 5100 - Principles of Population Health & Data Analysis for Advanced Nursing Practice Cr. 4.
- NRSE 5030 - Scholarly Writing Cr. 1.
- NRSE 6050 - Quality/Translation Cr. 3.
- NRSE 6713 - Systems Management Cr. 3.

MSN-DNP Concentration Requirements (9 hours)

- NRSE 6712 - Strategic Fiscal Management Cr. 3.
- NRSE 6714 - Executive Leadership Cr. 3.
- NRSE 6715 - Contemporary Problems in Executive Leadership in Nursing Cr. 3.

DNP Project (12 hours)

- NRSE 6801 - Residency I DNP Project Identification Cr. 3.

- NRSE 6802 - DNP Project Development Cr. 3.
- NRSE 6803 - DNP Project Implementation Cr. 3.
- NRSE 6804 - DNP Project Analysis and Dissemination Cr. 3.

Nursing, Pediatric Nurse Practitioner-Primary Care Concentration, DNP (TTU-ETSU)

Pediatric Nurse Practitioner - Primary Care Program Information

General Degree Information

The Doctor of Nursing Practice program offers a terminal professional degree for those who wish to pursue or further their career as an advanced practice nurse focusing on healthcare needs of specific populations. The ETSU College of Nursing and TTU School of Nursing Joint Program currently offers six concentrations within the degree: Adult/Gerontology Acute Care Nurse Practitioner, Executive Leadership, Family Nurse Practitioner, Pediatric Nurse Practitioner-Primary Care, Psychiatric/Mental Health Nurse Practitioner, and Women's Health Care Nurse Practitioner.

The focus of the Pediatric Nurse Practitioner-Primary Care concentration is patient centered quality care including common and acute illnesses while emphasizing quality of care and health outcomes. The patient population for this concentration is children of all ages. Graduates will be eligible for the Pediatric Nurse Practitioner-Primary Care National Certification examination. The Family Nurse Practitioner works in collaboration with other members of the healthcare team. Graduates are prepared for employment in varied healthcare settings.

For application terms and deadlines please refer to the Whitson-Hester School of Nursing website.

BSN-DNP Degree Requirements (77 hours)

- **Core Requirements:** 35 hours
- **Concentration:** 30 hours
- **DNP Project:** 12 hours
- **TOTAL:** 77 hours

BSN-DNP Core Requirements (35 hours)

- NRSE 5000 - Conceptual Systems for Advanced Nursing Practice Cr. 3.
- NRSE 5001 - Nursing Research for Evidence-Based Practice Cr. 3.
- NRSE 5006 - Advanced Role Development Cr. 3.
- NRSE 5009 - Health Assessment Throughout the Lifespan Cr. 3.
- NRSE 5010 - Health Assessment Throughout the Lifespan Practicum Cr. 3.
- NRSE 5016 - Advanced Pathophysiology Cr. 3.
- NRSE 5018 - Advanced Clinical Pharmacology Cr. 3.
- NRSE 5030 - Scholarly Writing Cr. 1.
- NRSE 5100 - Principles of Population Health & Data Analysis for Advanced Nursing Practice Cr. 4.
- NRSE 6002 - Health Policy Leadership Cr. 3.
- NRSE 6050 - Quality/Translation Cr. 3.
- NRSE 6713 - Systems Management Cr. 3.

BSN-DNP Concentration Requirements (30 hours)

- NRSE 5305 - Pediatric Primary Care I: Well Child Cr. 3.
- NRSE 5306 - Pediatric Primary Care II: Episodic & Minor Acute Illness Cr. 3.
- NRSE 5311 - Advanced Practice Nursing: Pediatric Primary Care Practicum I Cr. 3.
- NRSE 5312 - Advanced Practice Nursing: Pediatric Primary Care Practicum II Cr. 3.
- NRSE 5314 - ADVANCED APPLICATION IN DELIVERY OF ADVANCED PEDIATRIC PRIMARY CARE – PRECEPTORSHIP & CERTIFICATION PREP Credit 3.
- NRSE 5315 - HEALTH PROMOTION OF THE GROWING CHILD Credit 2.
- NRSE 5316 - PEDIATRIC PRIMARY CARE III – CHRONIC ILLNESS, DISABILITY, AND COMPLEX CONDITIONS Credit 3.
- NRSE 5317 - ADVANCED PEDIATRIC NURSING PRACTICUM III Credit 3.
- NRSE 6311 - Advanced Family System Assessment and Evaluation Cr. 3.
- NRSE 6317 - Integrated Applications of Leadership & Pediatric Healthcare Delivery Cr. 3.

DNP Project (12 hours)

- NRSE 6801 - Residency I DNP Project Identification Cr. 3.
- NRSE 6802 - DNP Project Development Cr. 3.
- NRSE 6803 - DNP Project Implementation Cr. 3.
- NRSE 6804 - DNP Project Analysis and Dissemination Cr. 3.

MSN-DNP Degree Requirements (30 hours)

- **Core Requirements:** 11 hours
- **Concentration:** 7 hours
- **DNP Project:** 12 hours
- **TOTAL:** 30 hours*

* If you are a MSN to DNP student and you are changing your specialization, your transcript will be evaluated and you will receive an individualized program of study from the Graduate Programs Coordinator to include 5000 level courses that you will need for certification.

MSN-DNP Core Requirements (11 hours)

- NRSE 5030 - Scholarly Writing Cr. 1.
- NRSE 5100 - Principles of Population Health & Data Analysis for Advanced Nursing Practice Cr. 4.
- NRSE 6050 - Quality/Translation Cr. 3.
- NRSE 6713 - Systems Management Cr. 3.

MSN-DNP Concentration Requirements (7 hours)

- NRSE 6311 - Advanced Family System Assessment and Evaluation Cr. 3.
- NRSE 6317 - Integrated Applications of Leadership & Pediatric Healthcare Delivery Cr. 3.

DNP Project (12 hours)

- NRSE 6801 - Residency I DNP Project Identification Cr. 3.
- NRSE 6802 - DNP Project Development Cr. 3.
- NRSE 6803 - DNP Project Implementation Cr. 3.
- NRSE 6804 - DNP Project Analysis and Dissemination Cr. 3.

Nursing, Psychiatric/Mental Health Nurse Practitioner Concentration, DNP (TTU-ETSU)

Psychiatric/Mental Health Nurse Practitioner Program Information

General Degree Information

The Doctor of Nursing Practice program offers a terminal professional degree for those who wish to pursue or further their career as an advanced practice nurse focusing on healthcare needs of specific populations. The ETSU College of Nursing and TTU School of Nursing Joint Program currently offers six concentrations within the degree: Adult/Gerontology Acute Care Nurse Practitioner, Executive Leadership, Family Nurse Practitioner, Pediatric Nurse Practitioner-Primary Care, Psychiatric/Mental Health Nurse Practitioner, and Women's Health Care Nurse Practitioner.

The focus of the Psychiatric/Mental Health Nurse Practitioner concentration is to prepare advanced practice nurses to provide comprehensive psychiatric-mental health care across the life span to individuals, groups and families in diverse settings. Graduates are eligible for Psychiatric Mental Health Nurse Practitioner national certification examination. The Psychiatric Mental Health Nurse Practitioner works in collaboration with other members of the healthcare team. Graduates are prepared for employment in varied healthcare settings.

For application terms and deadlines please refer to the Whitson-Hester School of Nursing website.

Total Program of Study Credit Hours - Psychiatric Mental Health Practitioner

- **Core Courses:** 23 hours
- **Concentration Courses:** 45 hours
- **DNP Project:** 12 hours
- **TOTAL Program of Study Credit Hours: Psychiatric Mental Health Practitioner:** 80 hours

BSN-DNP Degree Requirements (80 hours)

- **Core Requirements:** 35 hours
- **Concentration:** 33 hours
- **DNP Project:** 12 hours
- **TOTAL:** 80 hours

BSN-DNP Core Requirements (35 hours)

- NRSE 5000 - Conceptual Systems for Advanced Nursing Practice Cr. 3.
- NRSE 5001 - Nursing Reserach for Evidence-Based Practice Cr. 3.

- NRSE 5006 - Advanced Role Development Cr. 3.
- NRSE 5009 - Health Assessment Throughout the Lifespan Cr. 3.
- NRSE 5010 - Health Assessment Throughout the Lifespan Practicum Cr. 3.
- NRSE 5016 - Advanced Pathophysiology Cr. 3.
- NRSE 5018 - Advanced Clinical Pharmacology Cr. 3.
- NRSE 5030 - Scholarly Writing Cr. 1.
- NRSE 5100 - Principles of Population Health & Data Analysis for Advanced Nursing Practice Cr. 4.
- NRSE 6002 - Health Policy Leadership Cr. 3.
- NRSE 6050 - Quality/Translation Cr. 3.
- NRSE 6713 - Systems Management Cr. 3.

BSN-DNP Concentration Requirements (33 hours)

- NRSE 5303 - Psychopharmacology Cr. 4.
- NRSE 5404 - Advanced Family Psychiatric Nursing Care I Cr. 3.
- NRSE 5405 - Advanced Family Psychiatric Nursing Care I Practicum Cr. 3.
- NRSE 5408 - Advanced Family Psychiatric Nursing Care II Cr. 3.
- NRSE 5409 - Advanced Family Psychiatric Nursing Care II Practicum Cr. 3.
- NRSE 5410 - Interpersonal Treatment Modalities for Advanced Practice Nurse Cr. 3.
- NRSE 5411 - Interpersonal Treatment Modalities for Advanced Practice Nurse Practicum Cr. 3.
- NRSE 6414 - Neurobiology Psychiatric Disorder Cr. 3.
- NRSE 6415 - Mental Health Care Delivery Systems Cr. 3.
- Advisor Approved Elective Cr. 3.
- NRSE 6950 - Internship in Advanced Nursing Practice Cr. 3.

DNP Project (12 hours)

- NRSE 6801 - Residency I DNP Project Identification Cr. 3.
- NRSE 6802 - DNP Project Development Cr. 3.
- NRSE 6803 - DNP Project Implementation Cr. 3.
- NRSE 6804 - DNP Project Analysis and Dissemination Cr. 3.

MSN-DNP Degree Requirements (32 hours)

- **Core Requirements:** 11 hours
- **Concentration:** 9 hours
- **DNP Project:** 12 hours
- **TOTAL:** 32 hours*

*If you are a MSN to DNP student and you are changing your specialization, your transcript will be evaluated and you will receive an individualized program of study from the Graduate Programs Coordinator to include 5000 level courses that you will need for certification.

MSN-DNP Core Requirements (11 hours)

- NRSE 5030 - Scholarly Writing Cr. 1.
- NRSE 5100 - Principles of Population Health & Data Analysis for Advanced Nursing Practice Cr. 4.
- NRSE 6050 - Quality/Translation Cr. 3.
- NRSE 6713 - Systems Management Cr. 3.

MSN-DNP Concentration Requirements (9 hours)

- NRSE 6414 - Neurobiology Psychiatric Disorder Cr. 3.
- NRSE 6415 - Mental Health Care Delivery Systems Cr. 3.
- Advisor Approved Elective Cr. 3.

DNP Project (12 hours)

- NRSE 6801 - Residency I DNP Project Identification Cr. 3.
- NRSE 6802 - DNP Project Development Cr. 3.
- NRSE 6803 - DNP Project Implementation Cr. 3.
- NRSE 6804 - DNP Project Analysis and Dissemination Cr. 3.

Nursing, Women's Health Care Nurse Practitioner Concentration, DNP (TTU-ETSU)

Women's Health Care Nurse Practitioner Program Information

General Degree Information

The Doctor of Nursing Practice program offers a terminal professional degree for those who wish to pursue or further their career as an advanced practice nurse focusing on healthcare needs of specific populations. The ETSU College of Nursing and TTU School of Nursing Joint Program currently offers six concentrations within the degree: Adult/Gerontology Acute Care Nurse Practitioner, Executive Leadership, Family Nurse Practitioner, Pediatric Nurse Practitioner-Primary Care, Psychiatric/Mental Health Nurse Practitioner, and Women's Health Care Nurse Practitioner.

The focus of the Women's Health Care Nurse Practitioner concentration is to prepare advanced practice nurses to provide comprehensive health care to meet the unique needs of women in diverse settings. Graduates are eligible for Women's Health Care Nurse Practitioner national certification examination. The Women's Health Care Nurse Practitioner works in collaboration with other members of the healthcare team. Graduates are prepared for employment in varied healthcare settings.

For application terms and deadlines please refer to the Whitson-Hester School of Nursing website.

BSN-DNP Degree Requirements (79 hours)

- **Core Requirements:** 35 hours
- **Concentration:** 32 hours
- **DNP Project:** 12 hours
- **TOTAL:** 79 hours

BSN-DNP Core Requirements (35 hours)

- NRSE 5000 - Conceptual Systems for Advanced Nursing Practice Cr. 3.
- NRSE 5001 - Nursing Research for Evidence-Based Practice Cr. 3.
- NRSE 5006 - Advanced Role Development Cr. 3.
- NRSE 5009 - Health Assessment Throughout the Lifespan Cr. 3.
- NRSE 5010 - Health Assessment Throughout the Lifespan Practicum Cr. 3.
- NRSE 5016 - Advanced Pathophysiology Cr. 3.
- NRSE 5018 - Advanced Clinical Pharmacology Cr. 3.
- NRSE 5030 - Scholarly Writing Cr. 1.
- NRSE 5100 - Principles of Population Health & Data Analysis for Advanced Nursing Practice Cr. 4.
- NRSE 6002 - Health Policy Leadership Cr. 3.
- NRSE 6050 - Quality/Translation Cr. 3.
- NRSE 6713 - Systems Management Cr. 3.

BSN-DNP Concentration Requirements (32 hours)

- NRSE 5701 - Pharmacology for Women's Health Cr. 2.
- NRSE 5702 - Women's Health for Advanced Practice I: GYN Cr. 3.
- NRSE 5710 - Primary Care in Women's Health Cr. 3.
- NRSE 5711 - Women's Health for Advanced Practice IV Practicum Credit 2.
- NRSE 5712 - Women's Health for Advanced Practice II: OB Credit 4
- NRSE 5713 - Complex Issues in Women's Health Credit 3.
- NRSE 5714 - Women's Health for Advanced Practicum I: GYN Credit 2.
- NRSE 5715 - Women's Health for Advanced Practicum II: OB Credit 2.
- NRSE 6210 - Development of DNP Practice in Women's Health Cr. 3.
- NRSE 6211 - Advanced Nursing Care of the Vulnerable Woman Cr. 3.
- NRSE 6213 - Integrative Approaches to Women's Health Cr. 3.

DNP Project (12 hours)

- NRSE 6801 - Residency I DNP Project Identification Cr. 3.
- NRSE 6802 - DNP Project Development Cr. 3.
- NRSE 6803 - DNP Project Implementation Cr. 3.
- NRSE 6804 - DNP Project Analysis and Dissemination Cr. 3.

MSN-DNP Degree Requirements (32 hours)

- **Core Requirements:** 11 hours
- **Concentration:** 9 hours
- **DNP Project:** 12 hours
- **TOTAL:** 32 hours*

*If you are a MSN to DNP student and you are changing your specialization, your transcript will be evaluated and you will receive an individualized program of study from the Graduate Programs Coordinator to include 5000 level courses that you will need for certification.

MSN-DNP Core Requirements (11 hours)

- NRSE 5030 - Scholarly Writing Cr. 1.
- NRSE 5100 - Principles of Population Health & Data Analysis for Advanced Nursing Practice Cr. 4.
- NRSE 6050 - Quality/Translation Cr. 3.
- NRSE 6713 - Systems Management Cr. 3.

MSN-DNP Concentration Requirements (9 hours)

- NRSE 6210 - Development of DNP Practice in Women's Health Cr. 3.
- NRSE 6211 - Advanced Nursing Care of the Vulnerable Woman Cr. 3.
- NRSE 6213 - Integrative Approaches to Women's Health Cr. 3.

DNP Project (12 hours)

- NRSE 6801 - Residency I DNP Project Identification Cr. 3.
- NRSE 6802 - DNP Project Development Cr. 3.
- NRSE 6803 - DNP Project Implementation Cr. 3.
- NRSE 6804 - DNP Project Analysis and Dissemination Cr. 3.

Family Nurse Practitioner Certificate – Program

Nursing, Post-Graduate Certificate, Family Nurse Practitioner (FNP)

Family Nurse Practitioner Program Information

Curriculum

Required Courses

- NURS 6610 - Adult Health Primary Care I Cr. 3.
- NURS 6611 - Adult Health Primary Care I Practicum Cr. 3.
- NURS 6614 - Primary Care Pediatrics & Women's Health Cr. 3.
- NURS 6615 - Primary Care of the Family: Practicum Credit 3.
- NURS 6612 - Adult Health Primary Care II Cr. 3.
- NURS 6613 - Adult Health Primary Care II Practicum Cr. 3.
- NURS 6616 - Final FNP Preceptorship Cr. 3.

- NURS 6910 - Role Transition to Certification and Practice Cr. 2

Concentration(s) Total credits = 23

Total Clock Hours: 540 hours

Fall Start Course Plan

Fall, Semester #1

- NURS 6610 - Adult Health Primary Care I Cr. 3.
- NURS 6611 - Adult Health Primary Care I Practicum Cr. 3.

Spring, Semester #2

- NURS 6614 - Primary Care Pediatrics & Women's Health Cr. 3.
- NURS 6615 - Primary Care of the Family: Practicum Credit 3.

Summer, Semester #3

- NURS 6612 - Adult Health Primary Care II Cr. 3.
- NURS 6613 - Adult Health Primary Care II Practicum Cr. 3.

Fall, Semester #4

- NURS 6616 - Final FNP Preceptorship Cr. 3.
- NURS 6910 - Role Transition to Certification and Practice Cr. 2

Spring Start Course Plan

Spring, Semester #1

- NURS 6610 - Adult Health Primary Care I Cr. 3.
- NURS 6611 - Adult Health Primary Care I Practicum Cr. 3.

Summer, Semester #2

- NURS 6614 - Primary Care Pediatrics & Women's Health Cr. 3.
- NURS 6615 - Primary Care of the Family: Practicum Credit 3.

Fall, Semester #3

- NURS 6612 - Adult Health Primary Care II Cr. 3.
- NURS 6613 - Adult Health Primary Care II Practicum Cr. 3.

Spring, Semester #4

- NURS 6616 - Final FNP Preceptorship Cr. 3.
- NURS 6910 - Role Transition to Certification and Practice Cr. 2

MSN Post-Master's Nursing Certificate Program Nursing, Post Graduate Certificate for Psychiatric Mental Health Nurse Practitioner Concentration (MSN)

The PMHNP Post-Graduate Certificate is targeted toward Advance Practice Registered Nurses (Nurse Practitioner) who are seeking a second certification as a PMHNP. This certificate can be completed in a four-semester time frame for current APRN's. Certificate graduates will be eligible to sit for a second certification as a PMHNP. The certificate is a 23 credit hour and 560 clinical contact hour post-graduate certificate.

Certificate Admissions Requirements

- Minimum of a Master of Science of Nursing from a regionally accredited college/university and nursing program accreditation.
 - Current, unencumbered Registered Nurse license
 - Current certification as an APRN
 - A minimum of 3.0 GPA in the last degree earned
 - A minimum of a "B" in the 3 "P's" and these courses must be independent courses and address concepts across the lifespan:
 - Advanced Pathophysiology with general principles applied across the lifespan
 - Advanced Pharmacology including pharmacodynamics, pharmacokinetics, and pharmacotherapeutics of all broad classes of pharmacologic agents
 - Advanced Health Assessment with a lab and includes all human systems, advanced assessment techniques and approaches
- (The above courses are available at TTU and students can apply for non-degree status to complete these pre-admission requirements)

**Non-APRN's holding a minimum of a Master of Science in Nursing are encouraged to apply to the PMHNP concentration for an evaluation of their transcript to determine placement in the curriculum.

Required Coursework

- NURS 6710 - Advanced Family Psychiatric Nursing I Cr. 3.
- NURS 6711 - Advanced Family Psychiatric Nursing I: Practicum Cr. 3.
- NURS 6712 - Advanced Family Psychiatric Nursing II Cr. 3.
- NURS 6713 - Advanced Family Psychiatric Nursing II: Practicum Cr. 3.
- NURS 6714 - Advanced Family Psychiatric Nursing III Cr. 3.
- NURS 6715 - Advanced Family Psychiatric Nursing III: Practicum Cr. 3.
- NURS 6716 - Final Psychiatric Nursing Preceptorship Cr. 3.
- NURS 6911 - Role Transition to Certification and Practice for the Psychiatric Mental Health Nursing Practitioner Cr. 2.

Certificate

Nursing, Post Graduate Certificate Adult Geriatric Acute Care Nurse Practitioner

This post-graduate certificate in AGACNP will allow APRN's certified in other concentrations such as FNP to expand their role and increase their ability to market themselves in the acute care environment. This certificate is a 22 credit hour program and 500 clinical contact hours.

Required Coursework (22 Credit Hours)

- NURS 5604 - ADVANCED PATHOPHYSIOLOGY AND CLINICAL REASONING FOR ACUTE DISEASE MANAGEMENT Credit 3.

- NURS 5608 - ADVANCED PATHOPHYSIOLOGY AND CLINICAL REASONING FOR ACUTE DISEASE MANAGEMENT II Credit 3.
- NURS 5610 - DIAGNOSTIC INTERPRETATION & THERAPEUTIC MODALITIES Credit 3.
- NURS 5612 - ACUTE CARE & PHARMACOTHERAPEUTICS Credit 3.
- NURS 5613 - ADVANCED PATHOPHYSIOLOGY AND CLINICAL REASONING FOR ACUTE DISEASE MANAGEMENT Practicum I Credit 2.
- NURS 5614 - ADVANCED PATHOPHYSIOLOGY AND CLINICAL REASONING FOR ACUTE DISEASE MANAGEMENT II PRACTICUM Credit 2.
- NURS 5616 - INTERNSHIP IN ACUTE CARE NP PRACTICE Credit 2.
- NURS 5617 - DIAGNOSTIC INTERPRETATION & THERAPEUTIC MODALITIES Practicum Credit 2.
- NURS 6021 - APPLICATION OF ADVANCED SKILLS IN ACUTE CARE Credit 2.

500 Clinical Contact Hours

Nursing, Post Graduate Certificate for Nursing Education (NUED)

One of the contributing factors for the national nursing shortage is a deficit in qualified nursing faculty to support nursing programs. This is an issue at every level of nursing. In addition, health care facilities are seeking nurse educators to maintain clinical education expectations for nursing staff in their facilities. Providing an opportunity for nurses who currently hold a Master's of Science of Nursing degree to gain formal education and certification as a Nurse Educator is a positive move in promoting nursing education in both the classroom and clinical setting. This 16-credit hour post graduate certificate can be completed in 3 semesters and students will be enrolled in content courses with current MSN Nursing Education majors

Minimum Admissions Requirements for Current MSN Applicants

- Minimum of a Master of Science in Nursing from a regionally accredited college/university and nursing program accreditation
- Current, unencumbered Registered Nurse license
- A minimum of 3.0 GPA in the last degree earned
- A minimum of a "B" in the 3 "P's" and these courses must be independent courses and address the concepts across the lifespan:
 - Advanced Pathophysiology with general principles applied across the lifespan
 - Advanced Pharmacology including pharmacodynamics, pharmacokinetics, and pharmatherapeutics of all broad classes of pharmacologic agents
 - Advanced Health Assessment
- The above courses are available at TTU and students can apply for non-degree status to complete these pre-admission requirements

Total Credit Hours: 16

- NURS 6204 - Curriculum Design & Education Theory Cr. 3.
- NURS 6205 - Evaluation Methods in Nursing Education Cr. 2.
- NURS 6207 - Clinical Focus Practicum Cr. 2.
- NURS 6209 - Nursing Education Practicum Cr. 4.

- NURS 6210 - Innovative Teaching Strategies Cr. 2.
- NURS 6211 - Trends in Healthcare Management Cr. 2.
- NURS 6212 - Preparation for Certification Cr. 1.

Nursing, Post-Certificate Pediatric Nurse Practitioner

The Post-Certificate Pediatric Nurse Practitioner program is 23 credit hours and 510 clock hours.

Required Coursework (23 Credit Hours)

- NURS 5305 - PEDIATRIC PRIMARY CARE I- WELL CHILD Credit 3.
- NURS 5306 - PEDIATRIC PRIMARY CARE II- EPISODIC AND MINOR ACUTE ILLNESS Credit 3.
- NURS 5311 - PEDIATRIC PRIMARY CARE I- WELL CHILD PRACTICUM Credit 3.
- NURS 5312 - Advanced PEDIATRIC NURSING PRACTICUM II Credit 3.
- NURS 5314 - ADVANCED APPLICATION IN DELIVERY OF ADVANED PEDIATRIC PRIMARY CARE- PRECEPTORSHIP & CERTIFICATION PREP Credit 3.
- NURS 5315 - HEALTH PROMOTION OF THE GROWING CHILD Credit 2.
- NURS 5316 - PEDIATRIC PRIMARY CARE III-CHRONIC ILLNESS, DISABILITY, AND COMPLEX CONDITIONS Credit 3.
- NURS 5317 - ADVANCED PEDIATRIC NURSING PRACTICUM III Credit 3.

Nursing, Post-Graduate Certificate, Women's Health Nurse Practitioner

The Post-Graduate Certificate in Women's Health Nurse Practitioner is a 23 credit hour program with 600 contact clinical hours.

Required Coursework (23 Credit Hours)

- NURS 5701 - PHARMACOLOGY FOR WOMEN'S HEALTH Credit 2.
- NURS 5702 - WOMEN'S HEALTH FOR ADVACED PRACTICE I: GYN Credit 3.
- NURS 5710 - PRIMARY CARE FOR WOMEN'S HEALTH Credit 3.
- NURS 5711 - WOMEN'S HEALTH FOR ADVANCED PRACTICE IV PRACTICUM Credit 2.
- NURS 5712 - WOMEN'S HEALTH FOR ADVANCED PRACTICE II: OB Credit 4
- NURS 5713 - Complex Issues in Women's Health Credit 3.
- NURS 5714 - WOMEN'S HEALTH FOR ADVANCED PRACTICUM I: GYN Credit 2.
- NURS 5715 - WOMEN'S HEALTH FOR ADVANCED PRACTICUM II: OB Credit 2.
- NURS 5716 - WOMEN'S HEALTH FOR ADVANCED PRACTICE III: PRACTICUM Credit 2.

Independent Programs

Cooperative Education

Office of Career Development

Cooperative Education is a voluntary, independent education program available for all undergraduate and graduate students in any academic area. Work experience is gained with an employer who offers learning opportunities related to a student's academic discipline. The program provides careful supervision with timely evaluation of performance, attitude, and ability of the student on the job. The goal is to help students grow and improve their capabilities.

The co-op program allows a student to obtain on-the-job learning experiences that can increase motivational and conceptual understanding in the classroom. It can provide a realistic evaluation of your career choice along with the opportunity to earn a supplemental income to aid with college expenses.

Eligibility

Students must meet the following requirements:

- Register with the Career Development Office by establishing your on-line account.
- Minimum 2.5 GPA (GPA must be maintained while participating in the program).
- Full-time student status.
- Must complete one (1) semester at TTU prior to completing a co-op application.
- Transfer students from another college or university must complete two (2) full semesters at TTU prior to completing a co-op application.
- Attend an orientation session.

CO-OP Plans

There are four (4) co-op scheduling plans available:

- Plan A - Student works full-time for an employer for 12 months.
- Plan B - Student works alternate semesters at the employer's site (work, return to school, work, etc.)
- Plan C - Student will attend college and work approximately 20 hours per week for the employer.
- Plan D - Summer only assignment (two [2] or more summers)

Employers may specify in advance that students have completed certain courses prior to the co-op assignment. The co-op hiring process is competitive. Students must go through an interview process with the employer. Students participating in the co-op program must register and enroll in one credit hour for each semester of their assignment (including summer semester). This does not count toward graduation requirements.

Cooperative Education Courses

COOP 5010 - Co-op Off-Campus Assignments

Cr. 1.

Prerequisite: The individual must have been a fulltime Tennessee Tech graduate student in good standing the prior term. Selections are made by the employer in conjunction with the Office of Career Services. Co-op assignment is full-time, degree-related employment. One (1) hour credit granted per semester; total work experiences must not exceed 24 months. Credit earned will not decrease the normal minimum requirements of a student's program of study. A written report is required each semester from the student. The student's academic advisor evaluates the report and forwards it to the Office of Career Services. A grade of S (satisfactory) or U (unsatisfactory) will be reported for the student to the Records Office.

COOP 5020 - Co-op Off-Campus Assignments

Cr. 1.

Prerequisite: The individual must have been a fulltime Tennessee Tech graduate student in good standing the prior term. Selections are made by the employer in conjunction with the Office of Career Services. Co-op assignment is full-time, degree-related employment. One (1) hour credit granted per semester; total work experiences must not exceed 24 months. Credit earned will not decrease the normal minimum requirements of a student's program of study. A written report is required each semester from the student. The student's academic advisor evaluates the report and forwards it to the Office of Career Services. A grade of S (satisfactory) or U (unsatisfactory) will be reported for the student to the Records Office.

COOP 5030 - Co-op Off-Campus Assignments

Cr. 1.

Prerequisite: The individual must have been a fulltime Tennessee Tech graduate student in good standing the prior term. Selections are made by the employer in conjunction with the Office of Career Services. Co-op assignment is full-time, degree-related employment. One (1) hour credit granted per semester; total work experiences must not exceed 24 months. Credit earned will not decrease the normal minimum requirements of a student's program of study. A written report is required each semester from the student. The student's academic advisor evaluates the report and forwards it to the Office of Career Services. A grade of S (satisfactory) or U (unsatisfactory) will be reported for the student to the Records Office.

COOP 5040 - Co-op Off-Campus Assignments

Cr. 1.

Prerequisite: The individual must have been a fulltime Tennessee Tech graduate student in good standing the prior term. Selections are made by the employer in conjunction with the Office of Career Services. Co-op assignment is full-time, degree-related employment. One (1) hour credit granted per semester; total work experiences must not exceed 24 months. Credit earned will not decrease the normal minimum requirements of a student's program of study. A written report is required each semester from the student. The student's academic advisor evaluates the report and forwards it to the Office of Career Services. A grade of S (satisfactory) or U (unsatisfactory) will be reported for the student to the Records Office.

COOP 5070 - Co-op Off-Campus Assignments

Cr. 1.

Prerequisite: The individual must have been a fulltime Tennessee Tech graduate student in good standing the prior term. Selections are made by the employer in conjunction with the Office of Career Services. Co-op assignment is full-time, degree-related employment. One (1) hour credit granted per semester; total work experiences must not exceed 24 months. Credit earned will not decrease the normal minimum requirements of a student's program of study. A written report is required each semester from the student. The student's academic advisor evaluates the report and forwards it to the Office of Career Services. A grade of S (satisfactory) or U (unsatisfactory) will be reported for the student to the Records Office.

COOP 5080 - Co-op Off-Campus Assignments

Cr. 1.

Prerequisite: The individual must have been a fulltime Tennessee Tech graduate student in good standing the prior term. Selections are made by the employer in conjunction with the Office of Career Services. Co-op assignment is full-time, degree-related employment. One (1) hour credit granted per semester; total work experiences must not exceed 24 months. Credit earned will not decrease the normal minimum requirements of a student's program of

study. A written report is required each semester from the student. The student's academic advisor evaluates the report and forwards it to the Office of Career Services. A grade of S (satisfactory) or U (unsatisfactory) will be reported for the student to the Records Office.

Course Descriptions

Accounting

ACCT 4300 (5300) - Financial Statement Analysis

Lec. 3. Cr. 3.

Prerequisite: A grade of C or better in ACCT 3170 or FIN 3210, admission to the College of Business graduate program, or permission of instructor. In-depth study of the methodologies used to analyze financial statements. Emphasis is placed on the use of technology to understand and apply ratio analysis.

ACCT 4320 (5320) - Advanced Managerial Accounting

Lec. 3. Cr. 3.

Prerequisite: ACCT 3210 with a grade of C or better. Selected problems in cost accounting with emphasis on managerial uses of cost information.

ACCT 4600 (5600) - Forensic Accounting and Fraud Accounting

Lec. 3. Cr. 3.

Prerequisite: ACCT 2110 and ACCT 2120 with a grade of C or better. Junior standing or higher. Exposure to applicable authoritative literature, as well as to tools and methods used by modern forensic accountants to identify accounting and financial statement frauds.

ACCT 4700 (5700) - International Experience in Accounting

Lec. 3. Cr. 3.

Prerequisite: Consent of instructor and Department Chairperson. A short-term, faculty-led study abroad program highlighting selected historical and modern contributions to accounting and business from another country and culture. Course will also meet weekly during the semester.

ACCT 4900 (5900) - Special Topics in Accounting

Cr. 3.

Prerequisite: Permission from Instructor and Graduate Director. An advanced course covering advanced topics in accounting. Graduate credit will require meeting all of the criteria for the corresponding cross-listed 4000-level course, plus additional requirements established by the instructor.

ACCT 6010 - Accounting Information for Management Decisions

Lec. 3. Cr. 3.

Analysis, interpretation, and use of accounting information by managers in directing the operations of organizations. This course may not be used to satisfy prerequisite requirements for taking upper division undergraduate accounting courses.

ACCT 6210 - Corporate Tax Management and Research

Lec. 3. Cr. 3.

Prerequisite: Co-Requisite: ACCT 6281 and admission to Master of Accountancy degree program or permission of the instructor. Use of tax law and accounting data by management in planning, controlling, and decision making for corporations. Use of tax resources to address tax research questions.

ACCT 6220 - Auditing and Attestation

Lec. 3. Cr. 3.

Prerequisite: Co-Requisite: ACCCT 6281 and admission to Master of Accountancy degree program or permission of the instructor. Emphasizes case studies, auditing simulations, modern authoritative pronouncements, technology and current events in the accounting profession.

ACCT 6231 - Professional Certification: Business Environment and Concepts

Lec. 1. Cr. 1.

Prerequisite: Admission to Master of Accountancy degree program. Focused study and discussion of the topics covered on the Business Environment and Concepts (BEC) section of the Uniform CPA Examination. Coverage will cover review of key business and economic concepts.

ACCT 6232 - Professional Certification: Audit

Lec. 0. Cr. 1.

Prerequisite: Admission to the Master of Accountancy degree program. Focused study and discussion of the topics covered on the AUDIT section of the Uniform CPA Examination. Coverage will cover review of key auditing concepts, theories, and techniques.

ACCT 6233 - Professional Certification: Regulation

Lec. 0. Cr. 1.

Prerequisite: Admission to the Master of Accountancy degree program. Focused study and discussion of the topics covered on the REG section of the Uniform CPA Examination. Coverage will cover review of key taxation concepts, theories, and techniques.

ACCT 6234 - Professional Certification: Financial Accounting and Reporting

Lec. 0. Cr. 1.

Prerequisite: Admission to the Master of Accountancy degree program. Focused study and discussion of the topics covered on the FAR section of the Uniform CPA Examination. Coverage will cover review of key financial accounting concepts, theories, and techniques.

ACCT 6240 - Ethics and the Professional Code of Conduct

Lec. 1. Cr. 1.

Prerequisite: Admission to the Master of Accountancy degree program. Professional Accountants are subject to a Professional Code of Conduct. In addition, ethical conduct in both fact and appearance is a critical aspect of the practice of professional accounting. This course will focus on the concept of ethics as it applies to the profession and to the Professional Code of Conduct.

ACCT 6250 - Governmental and Not-for-Profit/Healthcare Accounting

Lec. 3. Cr. 3.

Prerequisite: Admission to the Master of Accountancy degree program or permission of instructor. Accounting, reporting, and budgeting for governmental entities and other not-for-profit organizations, including coverage of healthcare organizations. This is a case study course in accounting and reporting for governmental and not-for-profit entities, including healthcare entities.

ACCT 6260 - Tax Management of Flow-Through Entities and Strategy

Lec. 3. Cr. 3.

Prerequisite: Prerequisite: ACCT 6210 and ACCT 6281. Use of tax law and accounting data by management in planning, controlling, and decision making for flow-through entities. Use of analytical methods to address tax planning and strategy problems.

ACCT 6270 - Advanced Financial Accounting

Lec. 3. Cr. 3.

Prerequisite: Prerequisite: ACCT 6281 and admission to the Master of Accountancy degree program or permission of instructor. Theory and problems related to consolidated financial reporting, international accounting, corporate governance, and partnerships and accounting analytics.

ACCT 6281 - Professional Development I

Lec. 0. Cr. 1.

Prerequisite: Admission to the Master of Accountancy degree program. Examination of the role of leadership, teambuilding, and technical expertise in professional accounting as it relates to auditing and taxation of entities.

ACCT 6282 - Professional Development II

Lec. 0. Cr. 1.

Prerequisite: Admission to the Master of Accountancy degree program. Examination of the role of leadership, teambuilding, and technical expertise in professional accounting as it relates to auditing and taxation of entities.

ACCT 6290 - Essential Tech for Accountants

Lec. 2. Cr. 2.

Prerequisite: Admission to the Master of Accountancy degree program. Examination and application of current technology tools commonly used in the accounting profession including pivot tables, Vlookup tables, data filtering, graphic presentation of data, data security, and data extraction.

ACCT 6900 - Special Topics

Lec. 3. Cr. 3.

A case course dealing with current topics in business.

ACCT 6950 - MAcc Special Topics

Lec. 1-4. Cr. 1-4.

Prerequisite: Admission to Master of Accountancy. Special topics in Professional Accountancy. Students will engage in leading discussions, research, writing, and presentations designed to explore complex and timely issues in the field of accountancy such as data security, succession planning, legal liability, sustainability reporting, and international reporting standards.

Advanced Studies in Teaching and Learning

ASTL 6700/7700 - Portfolio Development

Cr. 3.

Presents an overview of the portfolio as an authentic assessment tool utilized to document the scholarship of teaching. It introduces educators to the concept of using artifacts/products/teacher work samples as evidence of effective teaching and, then, expands this to include student work samples as supportive evidence of that effectiveness. The course emphasis is focused on collection and presentation of teacher developed instructional examples organized comprehensively to demonstrate the educator's abilities in six areas: planning and teaching, actual teaching, assessment and evaluation, learning environment, professional growth, and communication. Although the format of the professional portfolio will follow the National Board for Professional Teaching Standards requirements, the student may choose whether or not to submit the portfolio for National Board Certification.

ASTL 6701/7701 - Teacher as Learner

Cr. 3.

Teachers seek to improve their knowledge and practice through a continuing process of professional reading, writing, dialogue, inquiry, and reflection. These processes can be supported by technology in a variety of ways. This course is designed to assist teachers to become comfortable with the hardware and software that can be used to create effective literacy learning experiences. In addition, teachers must also know how to find, access, and assess materials from a variety of sources as well as know how to design and develop multi- and hyper- media learning environments that promote active learning. The design and structure of the course will contribute to the professional development of educators to use effectively technology to promote and develop reflective learners-learners that are able to use technology to enhance and expand their learning environment.

ASTL 6703/7703 - Knowledge of the Learner

Cr. 3.

This course addresses the areas of child and adolescent psychological development. The focus is on the science of individual human development. In addition, infant development is covered briefly to provide an understanding of the sequential and hierarchical nature of development. The majority of assignments will deal with children in the kindergarten to eighth grade. However, early childhood and teen assignments will be included to understand the precursors and aftereffects childhood and middle childhood. The course emphasizes an understanding of the important methods, terms, theories, and findings in the field of developmental psychology. The primary focus of the class is the cognitive, socioemotional and physical changes associated with child and adolescent development. The course is organized in a topical format, exploring the basic theories and tracing development across the preadult years for each psychological topic covered. The course requires both independent reading, interaction with online

modules, field observations and Berk's text. It is strongly recommended that you have passed an introductory Developmental Psychology course before taking this class.

ASTL 6705/7705 - Assessment of Learning

Cr. 3.

Assessment of learning for the classroom is an introduction to systematic assessment at the classroom level. The course provides an overview of models for planning and implementing classroom assessment projects. The emphasis in the course, however, is implementation, data collection, analysis, and reporting of results on classroom assessment projects. This course presents a rationale for learning-centered assessment and an overview of the tools, techniques, and issues that educators should consider as they design and use assessments focused on learner needs. Underlying assumptions in the course are: (1) assessment is viewed as deliberately designed to improve and educate student performance, not merely audit it; (2) assessment is a way to help students systematically self-correct their performance; and (3) assessment has two essential qualities (anchoring in authentic tasks and feedback to revise performance). The course examines what it would mean, in reality, if assessment were central to student and teacher work.

ASTL 6706/7706 - Learning Strategies/Instructional Strategies

Cr. 3.

This course is designed to examine learning theories and to study their influence on current instructional practices. Students will be asked to reflect on the metacognitive processes involved in the decision making phase of classroom instruction. The alignment of National Board for Professional Teaching Standards with personal instructional practices is questioned and will be studied.

ASTL 6709/7709 - Action Research

Cr. 3.

Must be taken during the final semester of the program. Will empower classroom teachers to construct their own knowledge and to make it available to others for the benefit of all learners. This course is designed to help educators and other professionals understand the relationship between their own professional development and the process of improving the quality of pupils' and/or colleagues' learning.

ASTL 6721/7721 - Theory and Foundation of Developmental Literacy (Literacy I)

Cr. 3.

Literacy I will engage candidates in professional reading about, and discussions of, the following: the nature of learning, the nature of language, how human beings learn language, the differences between receptive and productive language, the nature of the reading process, the nature of the writing process, how children develop their native language, what the relationships are among learning one's 'mother tongue' and learning to read and write that same language, what the typical stages are through which children pass as they develop literacy, and what some of the more obvious implications are for classroom instruction and assessment in reading and writing. This course lays the foundation for all further learning about the teaching of literacy. Among other assessment devices, candidates will take and pass a comprehensive examination to determine their grasp of the concepts for this course. Application of technology, diversity issues, and use of appropriate resources will be part of this literacy course.

ASTL 6723/7723 - Understanding and Implementing Best Practices in Teaching Beginning Literacy (Literacy II)

Cr. 3.

Literacy II will engage candidates in reading and discussions to explore theory, understand best practices, and implement best practices in literacy instruction grades PreK-3. It will begin with an exploration of theory and best

practices for family literacy from the birth of a child to school age. Theory and best practices will be examined from entrance into school, preschool to kindergarten, followed by explorations of best practices for teaching reading and writing in the primary grades. Candidates will be expected to work with primary grade children as they attempt to understand and implement best practices in emergent and early literacy development.

ASTL 6725/7725 - Understanding and Implementing Best Practices for Continued Literacy Growth in the Middle Grades (Literacy III)

Cr. 3.

Literacy III will engage candidates in professional studies related to understanding and using best practice for continued literacy growth in the middle grades. This course reviews the characteristics of a comprehensive middle school reading program.

ASTL 6726/7726 - Diagnosing Literacy Problems K-8 (Literacy IV)

Cr. 3.

Literacy IV will engage candidates in reading, discussions, and implementation of diagnostic tools and techniques in literacy for struggling students grades K-8. Students enrolled in the course are expected to give specified reading tests at least two students.

ASTL 6729/7729 - Remediation of Literacy Problems K-8 (Literacy V)

Cr. 3.

Literacy V will engage candidates in reading, discussions, metacognition and implementation of instructional strategies based on the data derived from the diagnostic tools employed with students in Literacy IV. These students will be struggling readers in grades K-8. (Issues related to improving student writing will also be presented and explored.

Agribusiness Economics

AGBE 4110(5110) - Agricultural Futures Marketing and Options

Lec. 3 Cr. 3

Prerequisite: Admission to MBA program. Understanding the use of futures market contracts and options to limit risk exposure to producers and agribusiness firms. The study of market price determination, forecasting basis, technical analysis and on actual trading of futures and options through market simulation programs will be addressed. Term Paper Required.

AGBE 4130(5130) - Agricultural Policy

Lec. 3 Cr. 3

Prerequisite: Acceptance into MBA program; Econ 2020; and Econ 2010 Explore the landscape of agricultural policy and its impact on food and farming. We examine policy implications in developed and developing countries, and nutritional environments influencing policy makers.

AGBE 4200(5200) - Agribusiness Statistics

Lec. 3 Cr. 3.

Prerequisite: AGBE 2100 Sampling, probability, distributions, statistical tests, analysis of variance, regression, and interpretation of data.

AGBE 4210 (5210) - Agricultural and Biological Statistics

Lec. 3. Cr. 3.

Sampling, probability, distributions, statistical tests, analysis of variance, regression, interpretation of data. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

AGBE 4940 (5940) - Agribusiness Economics Topics

Cr. 1-4.

Prerequisite: Consent of instructor. Special study in an approved area of agribusiness economics under the supervision of a member of the School of Agriculture faculty. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

AGBE 4950 (5950) - Agribusiness Economics Topics

Cr. 1-4.

Prerequisite: Consent of instructor. Special study in an approved area of agribusiness economics under the supervision of a member of the School of Agriculture faculty. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

AGBE 5400 - Agricultural Finance

Lec. 3 Cr. 3

Prerequisite: Acceptance into MBA program; Econ2020; and Econ2010 Financial statements and analyses for farms and agribusiness firms, time value of money, capital and credit requirements, and sources. Term paper focused on a capital project required (15-20 pages).

Agriculture and Human Ecology

AGHE 4600 (5600) - Global Food Systems: Sustainability and Insecurity

Cr. 3.

Relationships of global food systems to environmental and human health. Dynamics of societal issues, population, food production, biodiversity, biotechnology and economics on food insecurity.

Agricultural Engineering Technology

AGET 4220 (5220) - Agricultural Machinery and Tractors

Lec. 2. Lab. 2. Cr. 3.

Principles of operation, selection, and economic utilization of agricultural power units and equipment. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

AGET 4510 (5510) - Agricultural Remote Sensing

Lec. 2. Lab 2. Cr. 3

This course will teach the fundamentals of remote sensing concepts and software used in agricultural, environmental, and natural resource applications.

AGET 4520 (5520) - Agricultural Spatial Technologies II

Lec. 2. Lab 2. Cr. 3.

Prerequisite: AGET 3520 – Agricultural Spatial Technologies I or instructor consent. Principles and applications of geospatial technologies supporting precision agriculture/farming and planning for natural resource data management. Global positioning system (GPS), geographic information system (GIS), remote sensing (RS), yield monitoring and mapping, Internet information access, and computer software for management decisions.

AGET 4540 (5540) - Advanced GIS for Agricultural and Natural Resources

Lec. 2. Lab 2. Cr. 3.

Prerequisite: AGET 3540 – Fund. of GIS and GPS or instructor consent. This course will teach advanced techniques using Geographic Information System (GIS) concepts, equipment, and software used in agricultural, environmental, and natural resource applications.

AGET 4610 (5610) - Greenhouse Structures and Landscaping Equipment

Lec. 3. Cr. 3.

Prerequisite: AGET 2110 or consent of instructor. Selection, design, construction, and operation of greenhouse structures and related nursery and landscaping equipment. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

AGET 4620 (5620) - Agricultural Structures

Lec. 2. Lab. 2. Cr. 3.

Prerequisite: AGET 2110 or consent of instructor. Planning; drawing; materials; principles of construction with respect to arrangement, location, and environmental control; plan reading. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

AGET 4720 (5720) - Agricultural Processing and Electric Power Technology

Lec. 3. Cr. 3.

Principles of fluid flow, heat transfer, drying, refrigeration, and electrical supply and control systems applied to agriculture. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

AGET 4940 (5940) - Agricultural Engineering Technology Topics

Cr. 1-4.

Prerequisite: Consent of instructor. Special study in an approved area of agricultural engineering technology under the supervision of a member of the School of Agriculture faculty. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

AGET 4950 (5950) - Agricultural Engineering Technology Topics

Cr. 1-4.

Prerequisite: Consent of instructor. Special study in an approved area of agricultural engineering technology under the supervision of a member of the School of Agriculture faculty. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

Agricultural Education

AGED 4150 (5150) - Communications and Public Relations in Agricultural and Extension Education

Lec. 3. Cr. 3.

Publics to be dealt with, public relations media, techniques of establishing and maintaining desirable communications and public relations in agriculture. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

AGED 4200 (5200) - Methods and Techniques of Teaching in Agricultural and Extension Education

Lec. 2. Lab. 2. Cr. 3.

Theory and practice in directing learning activities. Planning and delivering instruction to formal and informal groups in Agricultural and Extension Education. Preparing instructional materials. Using instructional technology. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

AGED 4250 (5250) - Use of Volunteers in Agricultural and Extension Education

Lec. 3. Cr. 3.

Developing skills in selecting, recruiting, training, coordinating, supervising, and evaluating volunteers in Agricultural and Extension Education. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

AGED 4300 (5300) - Development of Youth Programs in Agricultural and Extension Education

Lec. 3. Cr. 3.

Developing, Implementing, and evaluating the 4-H and FFA youth programs in Agricultural and Extension Education. Identifying needs and interests of youth. Identifying, securing, and developing supportive resources. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

AGED 4350 (5350) - Program Planning and Evaluation in Agricultural and Extension Education

Lec. 3. Cr. 3.

Advanced principles and procedures used in planning and evaluating Agricultural and Extension Education programs. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

AGED 4940 (5940) - Agricultural Education Topics

Cr. 1-4.

Prerequisite: Consent of instructor. Special study in an approved area of Agricultural Education under the supervision

of a member of the School of Agriculture faculty. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

AGED 4950 (5950) - Agricultural Education Topics

Cr. 1-4.

Prerequisite: Consent of instructor. Special study in an approved area of Agricultural Education under the supervision of a member of the School of Agriculture faculty. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

Agronomy

AGRN 4100 (5100) - Weed Science

Lec. 2. Lab. 2. Cr. 3.

Prerequisite: AGRN 1010 or consent of instructor. Plant and seed identification, growth habits, and dissemination of weeds. Biological, cultural, and chemical methods of control in the integrated pest management (IPM) concept. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

AGRN 4110 (5110) - Forage Crops Production and Management

Lec. 3. Lab. 2. Cr. 4.

Prerequisite: AGRN 1010 and 2210. Botany and classification, soil and climatic requirements, species adaptation, establishment, and management of grasses and legumes for silage, hay, and temporary, permanent, and rotational pastures for ruminants, swine, and horses. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

AGRN 4120 (5120) - Crop Improvement

Lec. 2. Lab. 2. Cr. 3.

Prerequisite: AGRN 1010 or consent of instructor. Objectives, genetic principles, and methods of crop improvement by conventional and genetic engineering methods. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

AGRN 4210 (5210) - Soil Fertility and Fertilizers

Lec. 2. Lab. 2. Cr. 3.

Prerequisite: AGRN 2210 or consent of instructor. Properties of soils in relation to plant nutrition; fertilizer materials and their relationship to soil fertility. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

AGRN 4220 (5220) - Environmental Soil Chemistry

Lec. 3. Cr. 3.

Prerequisite: AGRN 2210 or consent of instructor. Study of chemical composition of natural and anthropogenic material in soil and their reactions and movement in the soil environment. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

AGRN 4230 (5230) - Soil Classification

Lec. 2. Lab. 2. Cr. 3.

Prerequisite: AGRN 2210 or consent of instructor. Soil formation, morphology, and classification; methods of soil survey, and detailed mapping of an assigned area. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

AGRN 4940 (5940) - Agronomy Topics

Cr. 1-4.

Prerequisite: Consent of instructor. Special study in an approved area of agronomy under the supervision of a member of the School of Agriculture faculty. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

AGRN 4950 (5950) - Agronomy Topics

Cr. 1-4.

Prerequisite: Consent of instructor. Special study in an approved area of agronomy under the supervision of a member of the School of Agriculture faculty. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

AGRN 4960 (5960) - Soil Science Topics

Cr. 1-4.

Prerequisite: Consent of instructor. Special study in an approved area of soil science under the supervision of a member of the School of Agriculture faculty. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

Animal Science

ANS 4940 (5940) - Animal Science Topics

Cr. 1-4.

Prerequisite: Consent of instructor. Special study in an approved area of animal science under the supervision of a member of the School of Agriculture faculty. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ANS 4950 (5950) - Animal Science Topics

Cr. 1-4.

Prerequisite: Consent of instructor. Special study in an approved area of animal science under the supervision of a member of the School of Agriculture faculty. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

Applied Behavioral Analysis

ABAP 7120 - Positive Behavior Support & Families

Lec. 3. Cr. 3.

Prerequisite: Admission to Doctoral Program. Issues and practices associated with partnering with families in designing, implementing and evaluating positive behavior support for their children with challenging behavior.

ABAP 7910 - Independent Study in Early Childhood Special Education

Lec. 2. Cr. 2.

Prerequisite: Admission to Doctor Program and consent of instructor. Advanced study of an individual basis focusing on an area directly related to young children with special needs and their families.

ABAP 7920 - Topics, Issues & Research in Early Childhood Special Education

Lec. 2. Cr. 2.

Prerequisite: Admission to Doctoral Program and consent of instructor. Advanced study of a topic or topics relevant to research and/or practice in early childhood special education, early intervention or young children and positive behavior support.

EDUB 6000 - Conceptual Topics and Principles in Behavior Analysis

Cross-listing: EDUB 7000

Lec.3. Credit 3.

An introduction to concepts and principles related to behavior analytic procedures. For students in ABA concentration only. Students enrolled in the 7000-level course will be required to complete additional work as stated in the syllabus.

EDUB 6010 - Topics in Behavior Analysis

Cross-listing: EDUB 7010

Lec. 3. Cr. 3.

Prerequisite: EDUB 6050. An in-depth study of instructional methodologies for persons with moderate and severe disabilities. For students in the ABA concentration only. Students enrolled in the 7000-level course will be required to complete additional work as stated in the syllabus.

EDUB 6020 - Behavior Change Procedures and Systems Supports in ABA

Cross-listing: EDUB 7020

Lec. 3. Credit 3.

Prerequisite: EDUB 6000. The design, implementation, and evaluation of behavioral interventions and individualized behavioral supports using theoretical origins and behavior-analytic behavior change procedures. For students in ABA concentration only. Students enrolled in the 7000-level course will be required to complete additional work as stated in the syllabus.

EDUB 6030 - Assessment in Behavior Analysis

Cross-listing: EDUB 7030

Lec. 3. Cr. 3.

Instruction in the functional analysis of severe and challenging behaviors. Students enrolled in the 7000-level course will be required to complete additional work as stated in the syllabus.

EDUB 6050 - ABA Approaches in Developmental Disabilities

Cross-listing: EDUB 7050

Lec. 3. Cr. 3.

A comprehensive overview of research-based practices in the design and delivery of intervention and treatments to students with Autism Spectrum Disorders. Students enrolled in 7000-level course will be required to complete additional work as stated in the syllabus.

EDUB 6060 - Ethics in ABA

Cross-listing: EDUB 7060

Lec. 3. Cr. 3.

An overview of the ethical concerns related to the practice of applied behavior analysis.

Students enrolled in the 7000-level course will be required to complete additional work as stated in the syllabus.

EDUB 6320 - Research Methods in Behavior Analysis

Lec. 3. Cr. 3.

An in-depth analysis of measurements, data, interpretation, and experimental design in behavior analysis focusing on single-case methodology.

EDUB 6810 - Practicum in Behavior Analysis

Cross-listing: EDUB 7810

Cr. 1-3.

Supervised practice in development and application of behavioral intervention. Students enrolled in the 7000-level course will be required to complete additional work as stated in the syllabus. Course may be repeated several times.

EDUB 7000 - Conceptual Topics and Principles in Behavior Analysis

Cross-listing: EDUB 6000

Lec. 3. Credit 3.

An introduction to concepts and principles related to behavior analytic procedures. For students in ABA concentration only. Students enrolled in the 7000-level course will be required to complete additional work as stated in the syllabus.

EDUB 7010 - Topics in Behavior Analysis

Cross-listing: EDUB 6010

Lec. 3. Cr. 3.

Prerequisite: EDUB 6050. An in-depth study of instructional methodologies for persons with moderate and severe disabilities. For students in ABA concentration only. Students enrolled in the 7000-level course will be required to complete additional work as stated in the syllabus.

EDUB 7020 - Behavior Change Procedures and Systems Supports in ABA

Cross-listing: EDUB 6020

Lec. 3. Credit 3.

Prerequisite: EDUB 7000. The design, implementation, and evaluation of behavioral interventions and individualized behavioral supports using theoretical origins and behavior-analytic behavior change procedures. For students in ABA concentration only. Students enrolled in the 7000-level course will be required to complete additional work as stated in the syllabus.

EDUB 7030 - Assessment in Behavior Analysis

Cross-listing: EDUB 6030

Lec. 3. Cr. 3.

Prerequisite: Admission to Doctoral Program. Instruction in the functional analysis of severe and challenging behaviors. Students enrolled in the 7000 level course will be required to complete additional work as stated in the syllabus.

EDUB 7040 - Assessment of Autism Spectrum Disorders

Lec. 3. Cr. 3.

Prerequisite: Admission to the Ph.D. program and SPED 6050. A comprehensive overview of assessment methods used in the evaluation of children with Autism Spectrum Disorders.

EDUB 7050 - ABA Approaches in Developmental Disabilities

Cross-listing: EDUB 6050

Lec. 3. Cr. 3.

Prerequisite: Admission to the Ph.D. Program and EDUB 7040. A comprehensive overview of research-based practices in the design and delivery of intervention and treatments to students with Autism Spectrum Disorders. Students enrolled in the 7000-level course will be required to complete additional work as stated in the syllabus.

EDUB 7060 - Ethics in ABA

Cross-listing: EDUB 6060

Lec. 3. Cr. 3.

Prerequisite: Admission to the Ph.D. program. An overview of the ethical concerns related to the practice of applied behavior analysis. Students enrolled in the 7000-level course will be required to complete additional work as stated in the syllabus.

EDUB 7810 - Practicum in Behavior Analysis

Cross-listing: EDUB 6810

Cr. 1-3.

Prerequisite: EDUB 7010, EDUB 7030; SPED 6050; Admission to Doctoral Program. Supervised practice in development and application of behavioral intervention.

Art

ART 4100 (5100) - Art Tour

Cr. 3.

Prerequisite: ART 1030, 2110, 2120, 3130, 3150, or 3160, or consent of instructor. A 1-2 week trip to view internationally recognized art. A term paper is required. May be repeated for credit if trip is different. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ART 4140 (5140) - Art Theory

Lec. 3. Cr. 3.

Prerequisite: ART 2110, 2120, and 3130, or consent of instructor. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ART 4170 (5170) - Ancient Mesoamerican Art

Lec. 3. Cr. 3.

Prerequisite: None. Art and architecture of Pre- Columbian Mesoamerican cultures, including Olmec, Maya, Teotihuacan, Monte Alban, Veracruz, Mixtecs, and Aztecs. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ART 4540 (5540) - Special Problems in Clay

Cr. 3.

Prerequisite: Permission of the instructor. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ART 4640 (5640) - Special Problems in Fibers

Cr. 3.

Prerequisite: Permission of the instructor. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ART 4740 (5740) - Special Problems in Glass

Cr. 3.

Prerequisite: Permission of the instructor. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ART 4840 (5840) - Special Problems in Metals

Cr. 3.

Prerequisite: Permission of the instructor. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ART 4940 (5940) - Special Problems in Wood

Cr. 3.

Prerequisite: Permission of the instructor. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ART 6030 - Graduate Seminar in Crafts

Cr. 3.

ART 6070 - Independent Study-Art/Craft History

Cr. 1-3.

ART 6120 - Practicum-Ceramics

Cr. 1-3.

ART 6121 - Practicum-Ceramics

Cr. 1-3.

ART 6180 - Independent Studies Crafts/Clay

Cr. 1-3.

ART 6220 - Practicum-Fibers

Cr. 1-3.

ART 6221 - Practicum-Fibers

Cr. 1-3.

ART 6280 - Independent Studies Crafts/Fibers

Cr. 1-3.

ART 6320 - Practicum-Glass

Cr. 1-3.

ART 6321 - Practicum-Glass

Cr. 1-3.

ART 6380 - Independent Studies Crafts/Glass

Cr. 1-3.

ART 6420 - Practicum-Metals

Cr. 1-3.

ART 6421 - Practicum-Metals

Cr. 1-3.

ART 6480 - Independent Studies Crafts/Metals

Cr. 1-3.

ART 6520 - Practicum-Wood

Cr. 1-3.

ART 6521 - Practicum-Wood

Cr. 1-3.

ART 6580 - Independent Studies Crafts/Wood

Cr. 1-3.

Biology

BIOL 4000 (5000) - General Parasitology

Lec. 3. Lab. 2 Cr. 4.

Prerequisite: BIOL 1114, BIOL 3120 or BIOL 3130 or WFS 3120 or WFS 3130. Biology of animal agents and vectors of diseases, with emphasis placed on medical parasitology and organisms that parasitize fish and wildlife species. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

BIOL 4040 (5040) - Immunology

Lec. 3 Cr. 3.

Prerequisite: Junior standing. Introduction to basic principles of cellular and molecular immunology. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

BIOL 4060 (5060) - Hormones and Chemical Communication

Lec. 3. Cr. 3.

Prerequisite: Prerequisite: BIOL 3140 and CHEM 1110 or CHEM 1210. A survey of hormones, their functions, and mechanisms of action in vertebrate animals including humans. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

BIOL 4070(5070) - Vertebrate Development

Lec. 3/Lab 2 Cr. 4

Prerequisite: BIOL 1113 and BIOL 1123 Development of vertebrates from the origin of gametes through hatching and birth, including embryonic anatomy and physiology and events, mechanisms, facts, and theories influencing vertebrate development.

BIOL 4100 (5100) - Evolutionary Biology

Lec. 3. Cr. 3.

Prerequisite: BIOL 3810 and BIOL 3130 or WFS 3130. Theories, evidences, principles, and examples of organic evolution. Emphasis on anatomical, chemical, ecological, geological, anthropological, and genetic factors. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

BIOL 4110 (5110) - Microbial Evolution

Lec. 3. Credit 3.

Prerequisite: BIOL 3200 or BIOL 3230 Survey of microbial diversity and an in-depth evaluation of evolutionary mechanisms that lead to microbial speciation.

BIOL 4120 (5120) - Protozoology

Lec. 3. Lab. 2. Cr. 4.

Prerequisite: BIOL 3200 or BIOL 3230. Diversity, ecology, and taxonomy of protozoa, and the importance of protozoa as agents of human disease and as model organisms for studying eukaryotic cell biology. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

BIOL 4130 (5130) - Environmental Microbiology

Lec. 2. Lab. 2. Cr. 3.

Prerequisite: BIOL 3200 or 3230. The function of microorganisms in the environment. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

BIOL 4140 (5140) - Pathogenic Bacteriology

Lec. 3. Cr. 3.

Prerequisite: BIOL 3200 or BIOL 3230. Common bacterial pathogens will be reviewed, including: 1. How they cause disease; 2. Virulence factors and how they are identified and studied; and 3. Prevention of disease transmission.

BIOL 4150 (5150) - Molecular Genetics

Lec. 3. Cr. 3.

Prerequisite: BIOL 3810, CHEM 3005 or 3020. Molecular basis of inheritance with special emphasis on microorganisms. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

BIOL 4160 (5160) - Genetic Engineering Laboratory

Lab. 4. Cr. 2.

BIOL 4150 (5150) Techniques of bacterial genetics and recombinant DNA methodology. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

BIOL 4170 (5170) - Population and Conservation Genetics

Lec. 3. Cr. 3.

Prerequisite: BIOL 1114 and BIOL 3810. Introduction to empirical and theoretical conservation genetics.

BIOL 4220 (5220) - Biostatistics

Lec. 3. Cr. 3.

Prerequisite: MATH 1530 or MATH 1830. Probability and frequency distribution; statistical populations and samples; and tests of hypotheses used in biological research. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

BIOL 4230 (5230) - Animal Behavior

Lec. 3. Cr. 3.

Prerequisite: Junior standing. Introduction to basic principles underlying the behavior of animals. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

BIOL 4240 (5240) - Systematic Botany

Lec. 2. Lab. 3. Cr. 3.

Prerequisite: BIOL 1120 and 3240 or consent of instructor. Principles of evolutionary relationships among major plant groups, with an emphasis on the phylogeny of gymnosperms and flowering plant families. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

BIOL 4250 (5250) - Economic Botany

Lec. 3. Cr. 3.

Prerequisite: BIOL 2110 Interrelationships between plants and people. Topics include a survey of the past, present, and future uses of plants, and the role of conservation biology in the preservation of plant resources. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

BIOL 4300 (5300) - Plant Speciation and Evolution

Lec. 3. Cr. 3.

Prerequisite: BIOL 2110 and Junior Standing Principles of the evolution of plants at the micro- and macroevolution levels, including a survey of relevant primary and secondary literature.

BIOL 4310 (5310) - Plant Anatomy

Lec. 2. Lab. 3. Cr. 3.

Prerequisite: BIOL 2110 and Junior Standing. A comparative study of the structure of vascular plants in relation to function. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

BIOL 4320 (5320) - Plant Physiology

Lec. 2. Lab. 3. Cr. 3.

Physiological activities of seed plants, including photosynthesis, respiration, mineral nutrition, flowering, seed formation, and dormancy. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

BIOL 4330 (5330) - Plant Ecology

Lec. 2. Lab. 3. Cr. 3.

Prerequisite: BIOL 3130 or WFS 3130 Biotic and abiotic factors affecting the distribution and abundance of plant species, and the role of plants in ecosystem structure and function. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

BIOL 4340 (5340) - Plant-Animal Interactions

Lec. 2. Lab. 3. Cr. 3.

Prerequisite: BIOL 2110 and junior standing. Interactions of plants and animals in aquatic, terrestrial, and atmospheric environments at various ecological scales.

BIOL 4610 (5610) - Invertebrate Zoology

Lec. 2. Lab. 2. Cr. 3.

Prerequisite: 8 hours of BIOL/WFS courses, plus BIOL/WFS 3130, or consent of the instructor. Biology of invertebrates with emphasis on morphology, systematics, and ecology. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

BIOL 4630 (5630) - Ornithology

Lec. 2. Lab. 3. Cr. 3.

Prerequisite: Junior standing. General survey of the class Aves with emphasis on morphology, identification, and ecology of local birds. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

BIOL 4650 (5650) - Marine Biology

Lec. 3. Lab. 2. Cr. 4.

Prerequisite: BIOL 3130 or WFS 3130. An introduction to the study of the marine environment and marine organisms. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

BIOL 4750 (5750) - Medical Microbiology

Lec. 2. Lab. 4. Cr. 4.

Prerequisite: BIOL 3200 or 3230. A survey of microorganisms of medical importance, with emphasis on the bacteria and viruses. Principles of infectious diseases, including diagnostic methods and treatments. Laboratory exercises demonstrating methods of isolating and identifying pathogenic microorganisms. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

BIOL 4780 (5780) - Phycology

Lec. 2. Lab. 3. Cr. 3.

Prerequisite: Junior standing. Introduction to freshwater algae. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

BIOL 4810 (5810) - Ichthyology

Lec. 2. Lab. 3. Cr. 3.

Prerequisite: Junior standing. Identification, classification, anatomy, physiology, ecology, and adaptations of fishes; emphasis on North American freshwater species. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

BIOL 4820 (5820) - Mammalogy

Lec. 2. Lab. 3. Cr. 3.

Prerequisite: Junior standing. Classification, structure and function, phylogeny, and geographical distribution of mammals; emphasis on Tennessee mammals. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

BIOL 4830 (5830) - Herpetology

Lec. 2. Lab. 3. Cr. 3.

Prerequisite: Junior standing. Classification, adaptations, habits, life histories, and geographical distribution of amphibians and reptiles; emphasis on North American species. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

BIOL 4840 (5840) - Limnology

Lec. 2. Lab. 3. Cr. 3.

Prerequisite: Junior standing or consent of instructor. Physiochemical and biological dynamics of inland waters. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

BIOL 4850 (5840) - Applied Microbiology

Lec. 2. Lab. 2. Cr. 3.

Prerequisite: BIOL 3200 or 3230. Microbial production of foods and chemicals; microorganisms in food spoilage. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

BIOL 4860 (5860) - Disease Prevention

Lec. 3. Credit 3.

Prerequisite: Sophomore standing. Mechanisms of disease transmission, persistence of pathogens, and infection control.

BIOL 4870 (5870) - Microbiomes

Lec. 3. Credit 3.

Prerequisite: BIOL 3200 or BIOL 3230 An in-depth look at how the microbes in and on the human body affect everyday life and health.

BIOL 4880 (5880) - Bioethics

Lec. 3. Credit 3.

Introduction to the field of bioethics focusing on practical applications of ethical principles related to healthcare, medical science, and medical technology.

BIOL 4890 (5890) - Histology

Lec. 1; Lab 4 Credit 3.

Prerequisite: BIOL 1113 AND BIOL 1123 OR BIOL 2010 Introduction to the field of bioethics focusing on practical applications of ethical principles related to healthcare, medical science, and medical technology.

BIOL 4950 (5950) - Radiation Biology Seminar

Lec. 2. Cr. 2.

Prerequisite: BIOL 4940 (5940). In-depth discussion of specific topics in radiation biology. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

BIOL 4960 (5960) - Biotechnology Seminar

Lec. 1. Cr. 1.

Prerequisite: BIOL 4150 (5150) or consent of instructor. Discussion of current literature in biotechnology. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

BIOL 4991 (5991) - Advanced Topics

Cross-listing: WFS 4991 (5991)

Cr. 1.

Prerequisite: Consent of instructor and departmental chairperson. Focused study equivalent to one (1) credit hour on an advanced topic in the life sciences or wildlife/fisheries sciences under faculty supervision and approval of the departmental chairperson. Course may be repeated until a maximum of 12 hours of combined credit in BIOL (WFS) 499- (599-), Advanced Topics courses, are earned.

BIOL 4992 (5992) - Advanced Topics

Cross-listing: WFS 4992 (5992)

Cr. 2.

Prerequisite: Consent of instructor and departmental chairperson. Focused study equivalent to two (2) credit hours on an advanced topic in the life sciences or wildlife/fisheries sciences under faculty supervision and approval of the departmental chairperson. Course may be repeated until a maximum of 12 hours of combined credit in BIOL (WFS) 499- (599-), Advanced Topics courses, are earned.

BIOL 4993 (5993) - Advanced Topics

Cross-listing: WFS 4993 (5993)

Cr. 3.

Prerequisite: Consent of instructor and departmental chairperson. Focused study equivalent to three (3) credit hours on an advanced topic in the life sciences or wildlife/fisheries sciences under faculty supervision and approval of the departmental chairperson. Course may be repeated until a maximum of 12 hours of combined credit in BIOL (WFS) 499- (599-), Advanced Topics courses, are earned.

BIOL 4994 (5994) - Advanced Topics

Cross-listing: WFS 4994 (5994)

Cr. 4.

Prerequisite: Consent of instructor and departmental chairperson. Focused study equivalent to four (4) credit hours on an advanced topic in the life sciences or wildlife/fisheries sciences under faculty supervision and approval of the departmental chairperson. Course may be repeated until a maximum of 12 hours of combined credit in BIOL (WFS) 499- (599-), Advanced Topics courses, are earned.

BIOL 6100 - Advanced Microscopy

Lab. 6. Cr. 3.

Prerequisite: Consent of instructor. An applied course in the use and maintenance of research-grade microscopes and various optical systems. Topics also include computer image analysis, confocal laser scanning microscopy, photography, calibration, and measurement.

BIOL 6120 - Fishery Science

Lec. 2. Lab. 3. Cr. 3.

Prerequisite: WFS 4710 (5710). Current concepts and practices of fishery science, especially those environmentally related.

BIOL 6140 - Fish and Wildlife Biometrics

Lec. 2. Lab. 2. Cr. 3.

Prerequisite: WFS 4710 (5710) and BIOL 4220 (5220) or equivalents. Study and application of quantitative methods used to assess fish and wildlife populations. Estimation of parameters, hypothesis testing, and use of classical fisheries and wildlife statistical techniques.

BIOL 6150 - Reservoir Fisheries Management

Lec. 3. Cr. 3.

A comprehensive introduction to basic and applied aspects of managing fisheries in man-made impoundments.

BIOL 6160 - Cytogenetics

Lec. 2. Lab. 2. Cr. 3.

Prerequisite: BIOL 3810 and one (1) year of Chemistry. Normal and abnormal chromosome structure, crossing over, and control of gene action in eukaryotes.

BIOL 6220 - Cytology

Lec. 2. Lab. 2. Cr. 3.

Prerequisite: BIOL 3140 and CHEM 3010 or 3020. Study of the cell and its components.

BIOL 6350 - Management of Wetland Wildlife

Lec. 3. Lab. 3. Cr. 4.

Prerequisite: WFS 4700 (5700). Ecology and management of wildlife species occurring in wetland habitats, emphasis on waterfowl and southeastern fauna.

BIOL 6360 - Wetland Identification and Assessment

Lec. 3. Lab.3. Cr. 4.

Prerequisite: BIOL 6350. Advanced concepts of the physical, chemical, and biological properties of wetlands and how hydrology and geomorphology interact to create wetland ecosystems. field techniques for distinguishing wetlands from nonwetlands and for assessing functional capacity of wetland ecosystems will be covered.

BIOL 6370 - Management of Upland Wildlife

Lec. 3. Lab.3. Cr. 4.

Ecology and management of wildlife species occurring in upland habitats, emphasis on southeastern fauna.

BIOL 6420 - Water Resources Management Seminar

Lec. 2. Cr. 2.

Current problems and research in water resources management.

BIOL 6500 - Biological Photography

Lec. 2. Lab. 3. Cr. 3.

Photographic principles applied to biological materials; photomicrography and photomacrography; preparation of black and white prints for publication and slides for presentation.

BIOL 6600 - Microbial Ecology

Lec. 2. Lab. 4. Cr. 4.

Prerequisite: BIOL 3200 or 3230 or BIOL 4130 (5130). Topics will include role of microorganisms in nutrient cycling, techniques in sampling, enumeration, and activity measurements, distribution of microorganisms, diversity and adaptation, and microbial interactions including competition, symbioses, and predation.

BIOL 6630 - Animal Ecology

Lec. 2. Lab. 2. Cr. 3.

The relationship between animals and their environment; the structure, processes, and distribution of animal communities.

BIOL 6640 - Stream Ecology

Lec. 2. Lab. 3. Cr. 3.

Concepts in water chemistry and physics, hydrology, and sediments of lotic systems and their influences on ecological relationships. Stream production, metabolism, and energy flux relative to river continuum concepts will be emphasized through field studies and report preparation.

BIOL 6660 - Fish Ecology

Lec. 2. Lab. 3. Cr. 3.

Prerequisite: WFS 4710 (5710). Principles of the evolutionary ecology of fishes, including reproductive guilds, morphological and behavioral polymorphism, foraging, habitat selection, intraspecific and interspecific interactions, and stability of fish assemblages.

BIOL 6680 - Malacology

Lec. 2. Lab. 3. Cr. 3.

Prerequisite: Consent of instructor. Identification, classification, and ecology of freshwater bivalves. Emphasis on ecology of Ohio River basin species.

BIOL 6700 - Current Topics in Microbiology

Lec. 2. Cr. 2.

Discussion and literature search of current issues in medical and environmental microbiology, including scientific ethics, biotechnology issues, science, and politics.

BIOL 6810 - Ecological Ordination

Lec. 2. Lab. 3. Cr. 3.

Application of multivariate statistics in the study of ecology.

BIOL 6930 - Seminar

Lab. 2. Cr. 1.

Current literature in biology and presentation of current or completed graduate research.

BIOL 6960 - Molecular Biology Seminar

Lec. 1. Cr. 1.

Critical review and presentation of current research from molecular biology literature.

BIOL 6980 - Topics

Lab. 2-8. Cr. 1-4.

Prerequisite: Consent of instructor. Special study in an approved field under the supervision of a member of the graduate faculty as approved by the departmental chairperson.

BIOL 6990 - Research & Thesis

Cr. 1-9.

Business Administration

MBA 6830 - Business Consulting and Research

Lec. 3. Cr. 3.

Focus on business research methods, effective report construction with emphasis on expository strategy, case analysis, and oral presentation.

MBA 6840 - Field Research Project

Lec. 1-3. Cr. 1-3.

Research and writing of a business case or research problem. Requires approval of MBA Studies Committee.

MBA 6980 - International Experience

Lec. 3. Cr. 3.

MBA 6980 develops graduate students' understanding and knowledge of international business in a foreign nation.

This course is based on the assumption that immersion in an alternative national setting is an extremely powerful method of learning. The aim of the course is to introduce a global business approach to students. Topics covered will include cultural differences, international strategy, regional politics, the internal economic situation, marketing, international finance, quality in services, organizational development and change, international negotiations, and international operations. Course may be taken for credit two (2) times.

Business Law

LAW 6450 - Organizational Ethics

Lec. 3. Cr. 3.

A case course examining ethical issues and systems for solving complex ethical problems in domestic and multinational organization.

Business Management

BMGT 6200 - Organizational Leadership

Lec. 3. Cr. 3.

An examination of behavioral concepts required for effective leadership within business organizations.

BMGT 6900 - Special Topics

Lec. 3. Cr. 3.

A case course dealing with current topics in business.

BMGT 6950 - Business Strategy

Lec. 3. Cr. 3.

Prerequisite: ACCT 6010, FIN 6020, ECON 6050, MKT 6100, BMGT 6200. An integrative capstone course dealing with the formulation and implementation of corporate strategy.

Career Technical Education

CTE 4030 (5030) - Curriculum and Program Development for Career Technical Education

Lec. 3. Cr. 3.

A study of the fundamental steps involved in the development of curriculum in occupational education. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CTE 4040 (5040) - Advisory Committees in Industrial Education

Lec. 3. Cr. 3.

A study on how to effectively establish and utilize advisory committees for student programs in industrial education. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CTE 4050 (5050) - Academic and Career Technical Interdependence

Lec. 3. Cr. 3.

A study on how to infuse the academic and career technical programs into a unified educational delivery system. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CTE 4060 (5060) - Safety in Industrial Education

Lec. 3. Cr. 3.

A study of the safety requirements associated with the provision of a safe learning environment in industrial education. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CTE 4070 (5070) - History and Philosophy of Industrial Education

Lec. 2. Cr. 2.

History of industrial education in the United States and special focus on the development of a personal philosophy of industrial education. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CTE 4080 (5080) - Career Technical Student Organizations and Teaching Supervision

Lec. 3. Cr. 3.

The methods of establishment, supervision, and evaluation of career technical youth organizations in industrial education. Students enrolled in the 5000 level course will be required to complete additional work as stated in the syllabus.

CTE 4090 (5090) - Career Technical Education for Students with Special Needs

Lec. 3. Cr. 3.

Overview of the nature of special needs students, technique of modification of career technical curriculum and development of appropriate teaching materials. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CTE 4850 (5850) - Use of Technology in Career Technical Education

Cr. 1-3.

Laboratory approach providing opportunities for experienced educational personnel to concentrate their study in depth. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CTE 6010 - The State Plan for Industrial Education

Lec. 3. Cr. 3.

A study of the current State Plan, its administration, provisions, and implications for Industrial Education in Tennessee.

CTE 6020 - Professional Development in Industrial Education

Lec. 3. Cr. 3.

The identification and development of strategies to meet personal professional needs in industrial education.

Chemical Engineering

CHE 4110 (5110) - Introduction to Computational Heat, Mass, and Momentum Transfer

Lec. 3. Cr. 3.

General equations describing heat, mass, and momentum transport. Similarities and differences in transport properties are studied. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus. To obtain graduate credit, students enrolled in this course (CHE 5131) must conduct, in addition, a formal literature review as part of the writing of a full scientific paper.

CHE 4130 (5130) - Transfer Science III

Lec. 3. Cr. 3.

Prerequisite: CHE 2010. Principles, design, and operation of equipment for separation and purification of materials. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CHE 4210 (5210) - Chemical Reaction Engineering

Lec. 3. Cr. 3.

Prerequisite: CHE 3020 or consent of instructor. Chemical reaction kinetics and chemical reactor design. Emphasis on homogeneous reactions. Ideal and nonideal reactors. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus. To earn graduate credit for this course (CHE 5210), the following additional requirements will be met: (1) students will be able to model scaleup of isothermal and nonisothermal pilot reactors and (2) students will perform simulations of the transient condition for idealized reactors.

CHE 4300 (5300) - Introduction to Air Pollution

Lec. 3. Cr. 3.

Prerequisite: CHE 3110. Problems of air pollution and their solutions. Analysis and design of devices for the control of air pollutants from chemical processes. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CHE 4410 (5410) - Process Design I

Lec. 3. Cr. 3.

Prerequisite: Graduate standing in CHE and/or consent of instructor. Synthesis, design, economics, and optimization of chemical process systems. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CHE 4420 (5420) - Process Design II

Lec. 3. Cr. 3.

Prerequisite: CHE 4410 (5410) and graduate standing in CHE and/or consent of instructor. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CHE 4470 (5470) - Interdisciplinary Studies in Ceramic Materials Processing

Cross-listing: ME 4470 (5470)

Lec. 3. Cr. 3.

Prerequisite: Graduate standing in engineering or science. Materials processing; surface phenomena; particle size reduction; forming; consolidation by sintering and reaction processes; application of fracture mechanics; failure models; research on selected fabrication and synthesis routes for metals, ceramics and their composites; mechanical, chemical and morphological characterization theory and practice; materials design project using several onsite laboratories. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CHE 4510 (5510) - Applied Mathematics in Chemical Engineering

Lec. 3. Cr. 3.

Prerequisite: CHE 3020, 3120, and MATH 2910. Applied numerical methods and the solution of differential equations, both analytically and numerically, in chemical engineering. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CHE 4660 (5660) - Biochemical Engineering

Lec. 3. Cr. 3.

Prerequisite: CHE 4210 (5210) or consent of instructor. Applications of chemical engineering principles to the study of biochemical systems. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CHE 4730 (5730) - Chemical Engineering Operations

Lec. 3. Cr. 3.

Prerequisite: Senior or graduate standing. Decision making techniques as applied to management of chemical processing plants. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CHE 5330 - Polymer Engineering

Lec. 3. Cr. 3.

Prerequisite: CHEM 3020. Polymerization kinetics for key commercial polymers, structure/property relationships and characterization of key polymers, processing fundamentals, fundamentals of formulation of polymer composites and blends (nanocomposites, biopolymers).

CHE 6010 - Advanced Chemical Engineering Thermodynamics

Lec. 3. Cr. 3.

Prerequisite: Consent of instructor. Advanced thermodynamic concepts, especially phase and chemical equilibria, estimation and correlation of thermodynamic properties, and intermolecular forces.

CHE 6040 - Intermediate Fluid Mechanics

Cross-listing: CEE 6040, ME 6040

Lec. 3. Cr. 3.

Prerequisite: ME 3720. Formulation of mass and momentum transfer equations; exact solutions of laminar parallel flows; similarity and approximate solutions; potential flow; laminar momentum boundary layers.

CHE 6060 - Electrochemical Power Sources—Fuel Cells, Batteries, and Supercapacitors

Lec. 2. Lab. 2. Cr. 3.

Prerequisite: CHE 3010, ME 3210 or equivalent thermodynamics-related course. The lecture will start from the electrochemical thermodynamics and kinetics, with emphasis on electrochemical techniques, fundamental principles and technologies of batteries, fuel cells, and supercapacitors. A unique feature of the course is the fact that 20 percent of the time is spent in the laboratory using state of the art electrochemical instrumentation under the guidance of course instructor.

CHE 6100 - Intro to FWE: Problem Identification, Teamwork and Prototyping

Lec. 1. Credit 1.

Prerequisite: Consent of Instructor. Building on the Intro to FEW and Cultural Training courses, students will engage in problem identification at the FEW Nexus with guidelines to consider the sociology components, political and legal components, and environmental components at these intersections using the Renaissance Foundry Model. Concepts of sustainability and ethical design will be highlighted leveraging the Engineering for One Planet framework. Further, students will engage in both knowledge acquisition and knowledge transfer activities that will help build their collaborative, critical thinking, and innovation-driven learning skills to apply to the food-energy-water challenges identified in the course.

CHE 6110 - Computational Heat, Mass, and Momentum Transfer

Lec. 3. Cr. 3.

Prerequisite: Consent of instructor. An advanced study of fluid flow, heat transfer, and mass transfer.

CHE 6120 - Computational Heat, Mass, and Momentum Transfer

Lec. 3. Cr. 3.

Prerequisite: Consent of instructor. An advanced study of fluid flow, heat transfer, and mass transfer.

CHE 6130 - FEW Nexus Challenge

Lec. 3. Credit 3.

Prerequisite: CHE 6100; HIST 6100 or SOC 6100 Building on the Intro to FEW and Cultural Training courses, students will engage in problem identification at the FEW Nexus with guidelines to consider the sociology components, political and legal components, and environmental components at these intersections using the Renaissance Foundry Model. Concepts of sustainability and ethical design will be highlighted leveraging the Engineering for One Planet framework. Further, students will engage in both knowledge acquisition and knowledge transfer activities that will help build their collaborative, critical thinking, and innovation-driven learning skills to apply to the food-energy-water challenges identified in the course.

CHE 6140 - Physics of Transport

Lec. 3. Cr. 3.

Course is focused on learning fundamentals of conservation principles in chemical engineering applications. It reviews fundamentals of vector algebra and vector mechanics. The course introduces students to principles of conservation of momentum, total and species mass, and energy. Of particular interest is the integral equation-based formulation of these principles and their scaling to the microscopic scale. Systems for both traditional chemical

engineering applications and more recent ones including biotechnology and environmental areas are selected for illustrations.

CHE 6210 - Advanced Kinetics

Lec. 3. Cr. 3.

Prerequisite: Consent of instructor. Study of complex chemical reaction systems, catalytic and non-catalytic reactions, homogeneous and heterogeneous systems, and heat effects.

CHE 6410 - Advanced Process Engineering Design

Lec. 3. Cr. 3.

Prerequisite: Consent of instructor. Applications of thermodynamics, kinetics, transfer operations, and economics to optimum design of processes, equipment, and plants.

CHE 6530 - Process Optimization

Lec. 3. Cr. 3.

Prerequisite: Consent of instructor. Application of the principles of optimization and related techniques to the problems of chemical processes.

CHE 6540 - Process Dynamics

Lec. 3 Cr. 3.

Prerequisite: CHE 4540 or equivalent. Continuation of Chemical Engineering 4540. Frequency response methods, nonlinear methods, process applications, and computer simulation.

CHE 6552 - Advanced Special Topics in Energy and the Environment (ENEV)

Lec. 3 Cr. 3

Prerequisite: Math 2120 with a minimum grade of C Special current topics in Chemical Engineering with engineering content in nuclear power, solar power, alternative energy storage or production, carbon sequestration, economics of energy infrastructure. This course will cover the regulation, economics, process safety and technical developments associated with power production with consideration of how greener forms of energy production raise issues associated with environmental engineering stewardship.

CHE 6810 - Special Topics in Chemical Engineering

Lec. 3. Cr. 3.

Prerequisite: Consent of instructor. Topics such as polymeric materials, biochemical engineering, pollution abatement, air and liquid filtration, energy conversion, processing in extreme conditions.

CHE 6910 - Chemical Engineering Graduate Seminar

Lec. 1. Cr. 1.

Prerequisite: Graduate standing in Chemical Engineering. Current literature in Chemical Engineering and presentation of current or completed graduate research.

CHE 6920 - Chemical Engineering Graduate Seminar

Lec. 1. Cr. 1.

Prerequisite: Graduate standing in Chemical Engineering. Current literature in Chemical Engineering and presentation of current or completed graduate research.

CHE 6970 - Non-Thesis Design Project

Cr. 3.

Prerequisite: Admission to CHE M.S. degree program (non-thesis option) or admission to Direct Admit Ph.D. program. Scientific investigation into a topic in chemical engineering.

CHE 6990 - Research and Thesis

Cr. 1,3,6,9.

CHE 7030 - Molecular Thermodynamics

Lec. 3. Cr. 3.

Prediction and correlation of thermodynamic properties used in vapor-liquid and liquid-liquid phase equilibrium calculations. Monte-Carlo and Molecular Dynamics Simulation techniques.

CHE 7040 - Thermodynamics of Hydrocarbons

Lec. 3. Cr. 3.

Methods for presenting thermodynamic data of hydrocarbons; P-V-T correlations, K and alpha values, fugacity and activity coefficients.

CHE 7140 - Separation Processes

Lec. 3. Cr. 3.

Separation processes including multicomponent distillation, azeotropic and extractive distillation, gas absorption, and liquid-liquid extraction.

CHE 7220 - Chemical Reactors for Heterogeneous Systems

Lec. 3. Cr. 3.

Design of reactors for heterogeneous systems.

CHE 7230 - Advanced Nanocomposite Engineering Technology

Lec. 3. Cr. 3.

Prerequisite: CHE 6010. Nanoscience requires application of both continuum mechanics and quantum mechanics to aid materials design. The course will reflect interdisciplinary studies in composite engineering and chemistry to illuminate advanced principles of mechanics, characterization and thermodynamics in the emerging field of nanoscience/surface science. Modeling methodologies, scaling and modern processing techniques are taught.

CHE 7240 - Advances in Fuel Cell Electrocatalysis

Lec. 3. Cr. 3.

Prerequisite: CHE 6010. This course probes the state-of-the-art advances in electrocatalyst development and catalyst layer engineering for a variety of fuel feeds and fuel cell types. Nano-catalyst structure is a central issue. Characterization methodologies, redox reaction mechanisms and durability limitations will be covered.

CHE 7410 - Advanced Topics in Computational Molecular Design

Lec. 3. Cr. 3.

Prerequisite: CHE 6010 and consent of instructor. Strategies, techniques and applications associated with recent advances in the inverse design process of computational molecular design.

CHE 7420 - Advanced Topics in Multi-Scale Simulation of Materials

Lec. 3. Cr. 3.

Prerequisite: CHE 4510 (5510), CHE 6110 or equivalents with consent of instructor. This course will develop the concept of multi-scale analysis and mathematical approaches and illustrate them for a number of applications.

CHE 7430 - Computational Modeling of Electrochemical Systems

Lec. 3. Cr. 3.

Prerequisite: CHE 6110 or similar with consent of the instructor. Modeling methodologies, recent techniques and tools required to simulate electrochemical systems and in particular batteries.

CHE 7440 - Electrokinetics-Based Separations

Cr. 3.

Prerequisite: CHE 6110. This course will focus on the learning of key fundamental principles related to Electrokinetics-Hydrodynamics (EKHD) with selected applications to bio-separation including electrophoresis, electro-field flow fractionation, and electrokinetic-based separations.

CHE 7970 - Selected Topics

Lec. 3. Cr. 3.

Advanced special topics in chemical engineering taught on an as-needed basis.

CHE 7980 - Directed Study

Cr. 1-3.

CHE 7990 - Research and Dissertation

Cr. 1,3,6,9.

Chemistry

CHEM 4110 (5110) - Inorganic Chemistry

Spring. Lec. 3. Cr. 3.

Prerequisite: CHEM 2010 and CHEM 3500 or 3510. Correlation of physical and chemical properties of inorganic compounds and atomic structure. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CHEM 4150 (5150) - Inorganic Chemistry Laboratory

Lab. 3. Cr. 1.

Corequisite: CHEM 4110 (5110). Synthesis, isolation, and characterization of inorganic compounds, using conventional as well as microscale and inert gas techniques. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CHEM 4210 (5210) - Chemistry of Polymers

Fall. Lec. 3. Cr. 3.

Prerequisite: CHEM 3020, and CHEM 3500 or CHEM 3510. Preparation, structure, physical and chemical properties of organic and inorganic polymers. Experimental determination of average molar mass and its correlation to macroscopic properties. Thermal and viscoelastic behavior. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CHEM 4310 (5310) - Nuclear Chemistry and Radiochemistry

Spring. Lec. 2. Lab. 3. Cr. 3.

Prerequisite: CHEM 3500 or 3510 (may be taken concurrently). Introduction to theory of nuclear stability and decay processes. The laboratory emphasizes the detection, safe handling, and use of radioisotopes in chemical investigations. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CHEM 4320 (5320) - Spectrometric Identification of Organic Compounds

Spring. Lec. 2. Lab. 3. Cr. 3.

Prerequisite: CHEM 3020 and CHEM 3500 or 3510. The isolation and identification of organic compounds by both chemical and physical means with emphasis on spectroscopic methods. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CHEM 4410 (5410) - Forensic Chemistry

Lec. 3. Lab. 1. Cr. 4.

Prerequisite: CHEM 1120, 3020, and 3410. This course will examine the application of chemical concepts and methods to the analysis of crime scene evidence. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CHEM 4520 (5520) - Instrumental Analysis

Fall. Lec. 3. Lab. 3. Cr. 4.

Prerequisite: CHEM 3410 and 3510. Theory and practice of atomic spectroscopy, chromatography, and electroanalysis; discussion of selected instrumental techniques for analysis of surfaces, molecules, and particles. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CHEM 4610 (5610) - General Biochemistry I

Fall, Spring. Lec. 3. Cr. 3.

Prerequisite: CHEM 3010 or 3020, or consent of instructor. Chemistry of amino acids, proteins, lipids, carbohydrates, membranes, and nucleic acids. Includes study of pH, enzyme kinetics, three-dimensional structure, and biological separation methods and analysis. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CHEM 4620 (5620) - General Biochemistry II

Spring. Lec. 3. Cr. 3.

Prerequisite: CHEM 4610 (5610). Intermediary metabolism and its regulation, bioenergetics and photosynthesis, biosynthesis of proteins and nucleic acids. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CHEM 4650 (5650) - General Biochemistry Laboratory

Spring. Lab. 6. Cr. 2.

Prerequisite: CHEM 4610 (5610) or CHEM 4300 Laboratory techniques associated with contemporary general biochemistry to include buffer preparation, pKa determination, amino acid analysis, protein expression, separation and purification techniques, protein determination, enzymology, equilibrium and binding constant determinations, and carbohydrate analysis. The CHEM 5650 student will engage in additional procedures in some of the experiments.

CHEM 4710 (5710) - Environmental Chemistry

Fall. Lec. 3. Cr. 3.

Prerequisite: CHEM 3005 or 3010 CHEM 3410, 3500 or 3510 Basic concepts of environmental chemistry. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CHEM 4720 (5720) - Advanced Environmental Chemistry

Lec. 2. Lab. 3. Cr. 3.

Prerequisite: CHEM 4710 (5710). Advanced topics within environmental chemistry, including emphasis on organic, inorganic and analytical environmental chemistry. Case studies and contemporary literature in the field will be discussed. CHEM 5720 students will be required to carry out a more extensive field project and present a paper on an advanced topic in environmental chemistry. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CHEM 4970 (5970) - Special Topics

Lec. 1-3. Lab. 0-3. Cr. 1-4.

Prerequisite: Consent of instructor. Timely topics in chemistry. Course may be taken for credit more than once. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CHEM 5000 - Graduate Teaching Assistant Training

Lec. 1. Cr. 1.

Prerequisite: Full Standing in Chemistry M.S. program and instructor consent Laboratory safety procedures, safe management of chemical waste, and teaching pedagogy.

CHEM 6110 - Advanced Inorganic Chemistry

Fall. Lec. 3. Cr. 3.

Prerequisite: CHEM 4110 (5110). The correlation of the physical and chemical properties of inorganic compounds with their structure.

CHEM 6210 - Advanced Organic Chemistry

Spring. Lec. 3 Cr. 3.

Prerequisite: CHEM 3020 or consent of instructor Application of physical principles to the understanding of the structure and dynamics of organic compounds.

CHEM 6320 - Advanced Physical Chemistry

Fall. Lec. 3. Cr. 3.

Prerequisite: CHEM 3520. Advanced topics in physical chemistry to include aspects of statistical thermodynamics, quantum mechanics, spectroscopy, and kinetics.

CHEM 6350 - Advanced Molecular Modeling

Lec. 3. Cr. 3.

Prerequisite: CHEM 3510 or equivalent and consent of instructor Molecular graphics and visualization, computational quantum chemistry for molecular structure prediction, molecular mechanics force fields and their application, molecular dynamics simulations, QSAR, biochemical macromolecule and analysis.

CHEM 6410 - Advanced Analytical Chemistry

Spring. Lec. 2. Lab 3 Cr. 3.

Prerequisite: CHEM 4520 (5520). Statistical interpretation of data; electronics of instrumentation; optimization of chromatographic methods; recent developments in spectroscopy, chromatography, and mass spectrometry.

CHEM 6610 - Advanced Biochemistry

Fall. Lec. 3. Cr. 3.

Prerequisite: CHEM 4610 (5610). Current advanced topics in Biochemistry selected from recent peer reviewed literary journals. Instruction, with practical exercises, in the step-by-step stages of grant planning, locating funding sources, and writing successful grant proposals.

CHEM 6900 - Directed Studies in Chemistry

Lec. 1. Cr. 1.

Prerequisite: Graduate standing in chemistry. Investigation of a current area of research which is compatible with the student's interest and abilities. (Maximum credit toward degree is one [1] hour.)

CHEM 6910 - Chemistry Literature Seminar

Fall, Spring. Lec. 1. Cr. 1.

Prerequisite: Consent of thesis advisor. Review and oral presentation of current topic in chemical literature. (Maximum credit toward degree is one [1] hour.)

CHEM 6911 - Chemistry Thesis Seminar

Fall, Spring. Lec. 1. Cr. 1.

Prerequisite: Full standing in Chemistry, M.S. program, and consent of thesis advisor. Oral presentation of student's thesis research. (Maximum credit toward degree is one [1] hour.)

CHEM 6970 - Advanced Special Topics in Chemistry

Lec. 1-3. Lab.0-3. Cr. 1-4.

Prerequisite: Consent of instructor. An advanced course for current topics in chemistry. Course may be taken for credit more than once.

CHEM 6990 - Research and Thesis

Cr. 1-9.

Civil and Environmental Engineering

CEE 4130 (5130) - Matrix and Finite Element Methods

Lec. 3. Cr. 3.

Prerequisite: CEE 3320 or ME 4640 (5640) and MATH 2010 or MATH 4510 (5510). Matrix formulations using flexibility and stiffness methods for structural analysis of skeletal structures. Finite element formulations and applications. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CEE 4170(5170) - Introduction to Mechanics of Composites

Lec. 3 Cr. 3

Prerequisite: CEE3110 Introduction to mechanics of fibrous, laminated composites. Micromechanics, mechanical properties, stiffness and strength, and classical laminate theory. Thermal and moisture effects. Effective engineering properties of laminates. Failure theories, design criteria, and computational implementation.

CEE 4190 (5190) - Advanced Mechanics of Materials

Cross-listing: ME 4190 (5190)

Lec. 3. Cr. 3.

Prerequisite: CEE 3110, MATH 2120, or consent of instructor. Advanced topics; fracture mechanics, elastic support, noncircular shafts, curved beams, thick-walled cylinders, introduction to plates, thin shells of revolution. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CEE 4350 (5350) - Advanced Structural Design

Lec. 3. Cr. 3.

Prerequisite: CEE 4310. Special topics in analysis and design of steel structures. Plastic design, composite design, plate girders, special connections, and introduction to timber design. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CEE 4360 (5360) - Advanced Topics in Structural Concrete Design

Lec. 3. Cr. 3.

Prerequisite: CEE 4320. Special topics in the design of concrete structures. Combined footings; retaining walls, two-way slabs, and prestressed concrete. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CEE 4370 (5370) - Masonry Design

Lec. 2. Rec. 2. Cr. 3.

Prerequisite: CEE 3030 and CEE 4320 or consent of instructor. Masonry materials and construction. Design of

masonry beams, walls, and columns. Seismic design of masonry structures. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CEE 4380 (5380) - Bridge Design

Lec. 3. Cr. 3.

Prerequisite: CEE 4310. Design of structural steel and reinforced concrete bridges. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CEE 4410 (5410) - Solid and Hazardous Waste Management

Lec. 3. Cr. 3.

Prerequisite: CEE 3413 or consent of instructor. The collection and disposal of solid wastes. Treatment and disposal technologies of hazardous wastes. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CEE 4420 (5420) - Engineering Hydrology

Lec. 3. Cr. 3.

Prerequisite: CEE 3420 or consent of instructor. Fundamental processes in the hydrologic cycle, including precipitation, infiltration, and runoff. Development of quantitative approaches for engineering hydrology problems such as watershed modeling and storm water analysis. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CEE 4430 (5430) - Water and Wastewater Engineering

Lec. 3. Cr. 3.

Prerequisite: CEE 3413 or consent of instructor. Analytical methods for use in water quality management of streams, lakes, reservoirs, and groundwater systems. Project design of water and wastewater treatment plants. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CEE 4440 (5440) - Water Resources Engineering

Lec. 3. Cr. 3.

Prerequisite: CEE 3420 or consent of instructor. Problems related to the planning and design of systems to manage water resources for flood-damage reduction, hydropower, and river navigation. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CEE 4450 (5450) - Water Quality Modeling

Lec. 3. Cr. 3.

Prerequisite: CEE 3413 or consent of instructor. Mathematical modeling of chemical and biological processes occurring in streams, lakes, and estuaries, emphasizing oxygen demand and nutrient processes. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CEE 4460 (5460) - GIS Applications in Civil and Environmental Engineering.

Lec. 3. Cr. 3.

Prerequisite: CEE 3420 or consent of instructor. GIS & spatial data models; projections and coordinate systems; maps, data entry, editing & output; basic spatial analysis; GPS& GNSS; aerial & satellite images; terrain analysis; raster analysis; and spatial estimation.

CEE 4600 (5600) - Civil Engineering Materials II

Lec. 2. Lab. 2. Cr. 3.

Prerequisite: CEE 3030. Design and testing of highstrength Portland Concrete Cement, selfconsolidating PCC, high volume fly ash PCC and pervious PCC. Controlled low-strength materials. Concrete formwork design. Masonry materials evaluation. Aggregate production and improvement. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CEE 4610 (5610) - Pavement Design

Lec. 3. Cr. 3.

Prerequisite: CEE 3610. Structural design of flexible and rigid pavements. Pavement rehabilitation. Properties of subgrades, base courses and paving materials. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CEE 4630 (5630) - Traffic Engineering

Lec. 3. Cr. 3.

Prerequisite: CEE 3610. Techniques of traffic engineering measurements, investigations, and data analysis; design, application, and operation of traffic control systems and devices. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CEE 4640 (5640) - Highway Engineering

Lec. 3. Cr. 3.

Prerequisite: CEE 3610. Theory and practice of highway geometric design; highway plans; construction practices; computer applications to highway design. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CEE 4660 (5660) - Transportation Planning

Lec. 3. Cr. 3.

Prerequisite: CEE 3610. System planning and evaluation. Characteristics, impacts and costs. User patterns. Alternative analysis. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CEE 4810 (5810) - Foundation Engineering

Lec 3. Cr. 3.

Prerequisite: CEE 4800. Soil mechanics review (emphasis on stress and shear strength), bearing capacity, magnitude and time-rate of consolidation, geotechnical design of shallow and deep foundations, lateral earth pressure, and geotechnical aspects of retaining wall design.

CEE 4850 (5850) - Forensic Engineering

Lec. 3. Cr. 3.

Prerequisite: CEE 4310 or CEE 4320 Forensic case studies related to civil engineering.

CEE 4930 (5930) - Noise Control

Cross-listing: ME 4930 (5930)

Lec. 2. Lab. 2. Cr. 3.

Prerequisite: ME 2129, PHYS 2120. Identification and description of noise sources and noise radiation, methods of noise measurement and criteria for noise levels, principles and techniques of noise control. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CEE 4990 (5990) - Special Problems

Cr. 1-4 per semester.

Prerequisite: Approval of Departmental Chairperson. Current topics in civil engineering. May not be repeated to improve a grade.

CEE 6040 - Intermediate Fluid Mechanics

Cross-listing: CHE 6040, ME 6040

Lec. 3. Cr. 3.

Prerequisite: ME 3720. Formulation of mass and momentum transfer equations; exact solutions of laminar parallel flows; similarity and approximate solutions; potential flow; laminar momentum boundary layers.

CEE 6100 - Advanced Computer Applications in Civil Engineering

Lec. 3. Cr. 3.

Prerequisite: Consent of instructor. Civil Engineering analysis and design applications using advanced programming languages.

CEE 6200 - Statistical Inference for Engineers

Cross-listing: ENGR 6200.

Lec. 3. Cr. 3.

Prerequisite: Introductory calculus based statistics course or consent of instructor. Decision making with hypothesis testing and confidence intervals. Multiple regression and stepwise regression. Design of one and multifactor experiments. 2k experiments with blocking and fractional factorials. Control charting of time series data.

CEE 6300 - Multiscale Analysis of Concrete

Lec. 3. Cr. 3.

Prerequisite: CEE 3030. Manufacturing, hydration, and microstructural development of Portland cement. Fresh and hardened concrete properties. Special concrete applications, including fiber-reinforced, high performance, and lightweight concretes.

CEE 6310 - Bituminous Materials

Lec. 2. Lab. 2. Cr. 3.

Prerequisite: CEE 3030. Production and properties of bituminous materials. Use of asphalts in pavement construction, maintenance, and recycling. Design and construction of surface treatments and overlays.

CEE 6330 - Advanced Pavement Design

Lec. 3. Cr. 3.

Prerequisite: CEE 4610 (5610) or consent of instructor. Design of low volume road, airport, heavy duty, masonry, and composite pavements. Bases and subgrades. Pavement drainage.

CEE 6350 - Finite Element Analysis

Cross-listing: ME 6350

Lec. 3. Cr. 3.

Prerequisite: CEE 4130/5130 or CEE 4190/5190 or ME 4180/5180 or consent of instructor. Introduction of analysis of stresses in continuum by the finite element method. Computer applications.

CEE 6360 - Introduction to Continuum Mechanics

Cross-listing: ME 6360

Lec. 3. Cr. 3.

Prerequisite: Consent of instructor. Tensors, balance, laws, constitutive equations, thermodynamic restrictions, applications.

CEE 6370 - Vibrations of Continuous Media

Cross-listing: ME 6370

Lec. 3. Cr. 3.

Prerequisite: CEE 3110, MATH 4510 (5510), ME 3050. Governing equations for strings, bars, and membranes; natural frequencies; normal modes; series solutions; wave propagation; transform methods; characteristics.

CEE 6400 - Traffic Simulation

Lec. 2. Lab 2. Cr. 3.

CEE 4630 (5630) or consent of the instructor. Discrete event simulation, Monte Carlo simulation, random number generators, sampling from distributions, synthetic origin-destination matrices, general simulation modelling and advanced traffic simulation modelling.

CEE 6410 - Traffic Control Systems

Lec. 2. Lab. 2. Cr. 3.

Prerequisite: Consent of instructor. Theory and practical applications of traffic regulatory measures and traffic control systems, including adaptive, responsive, preemption, and Intelligent Transportation Systems.

CEE 6430 - Probabilistic Methods in Hydrosceince

Lec. 3. Cr. 3.

Prerequisite: ISE 3200 or consent of instructor. Advanced concepts of probabilistic approaches with emphasis on hydrosceince applications, mathematical and statistical background for tochastic analysis.

CEE 6440 - Hydrometeorology

Lec. 3. Cr. 3.

Prerequisite: CEE 4420 (5420), Engineering Hydrology, or consent of instructor. Theory and observations of hydrological processes in land surface and atmosphere. Exchanges of mass, heat and momentum between soil, vegetation, or water surface and overlying atmosphere. Precipitation processes, radiation and clouds, atmospheric boundary layer dynamics, coupled balance of moisture and energy, soil moisture and climate feedbacks, hydroclimatology, monsoonal flow and thunderstorms. Emphasis on recent research and modern methods for data analysis and modeling.

CEE 6450 - Geometric Design of Roadways

Lec. 2. Lab. 2. Cr. 3.

Prerequisite: Consent of instructor. Advanced concepts of the design of streets and highways. Design criteria, controls and standards for design alignment, cross sections, intersections, and interchanges.

CEE 6460 - Transportation Safety Engineering

Lec. 3. Cr. 3.

Prerequisite: Consent of instructor. Basic structure of transportation safety, traffic safety analysis and issues to identify, address, and implement countermeasures in crash areas, community oriented safety programs.

CEE 6470 - Transportation Demand Analysis

Lec. 3. Cr. 3.

Prerequisite: CEE 4660 (5660), ISE 3200, or consent of instructor. Theory and development of models of trip generation, trip distribution, mode choice, and traffic assignment. Transportation supply. Travel survey. Intercity-passenger travel-demand. Demand for air transportation.

CEE 6520 - Open-Channel Hydraulics

Lec. 3. Cr. 3.

Prerequisite: CEE 3420 or consent of instructor. Advanced topics in open-channel hydraulics, including design of hydraulic structures, gradually varied flow, unsteady flow, and flood routing techniques.

CEE 6610 - Applied Environmental Chemistry

Lec. 2. Lab. 3. Cr. 3.

Prerequisite: Consent of instructor. Theoretical concepts from inorganic, organic, physical, and biological chemistry as applied to the analysis of environmental engineering problems.

CEE 6620 - Applied Environmental Chemistry

Lec. 2. Lab. 3. Cr. 3.

Prerequisite: Consent of instructor. Theoretical concepts from inorganic, organic, physical, and biological chemistry as applied to the analysis of environmental engineering problems.

CEE 6710 - Environmental Engineering Unit Operations and Processes

Lec. 3. Cr. 3.

Prerequisite: Consent of instructor. An advanced study of the physical, chemical and biological unit operations processes for water and wastewater treatment.

CEE 6720 - Environmental Engineering Unit Operations and Processes

Lec. 3. Cr. 3.

Prerequisite: Consent of instructor. An advanced study of the physical, chemical and biological unit operations processes for water and wastewater treatment.

CEE 6740 - Industrial Waste Treatment

Lec. 2. Cr. 2.

Prerequisite: Consent of instructor. Characteristics of industrial wastes and of processes producing such wastes. Methods of treating industrial wastes.

CEE 6750 - Environmental Modeling

Lec. 3. Cr. 3.

Prerequisite: CEE 4430 (5430) or consent of instructor. Mathematical modeling of chemical and biological processes occurring in streams, lakes, and estuaries, emphasizing oxygen demand and nutrient processes.

CEE 6760 - Environmental Microbiology

Lec. 2. Cr. 2.

Prerequisite: Consent of instructor. Study of the microorganisms of importance in connection with environmental engineering processes.

CEE 6770 - Environmental Engineering Laboratory

Lab. 3. Cr. 1.

Corequisite: CEE 6710 and CEE 6720. Environmental engineering laboratory experience related to unit operations and processes and environmental microbiology.

CEE 6780 - Environmental Engineering Laboratory

Lab. 3. Cr. 1.

Corequisite: CEE 6710 and CEE 6720. Environmental engineering laboratory experience related to unit operations and processes and environmental microbiology.

CEE 6800 - Advanced Soil Mechanics

Lec 3. Cr. 3.

Prerequisite: CEE 4800. Soil mechanics principles including geostatic stress and consolidation process; drained and undrained behavior; pore pressure parameters; shear strength testing; peak, fully softened, and residual shear strength of soil.

CEE 6810 - Advanced Structural Mechanics

Lec. 3. Cr. 3.

Prerequisite: CEE 4130 (5130). Solution of large two- and three-dimensional structural systems by matrix and classical methods, nonprismatic and curved members, introduction to nonlinear problems.

CEE 6820 - Seepage and Slope Stability.

Lec. 3. Cr. 3.

Prerequisite: CEE 4800. Soil permeability and shear strength fundamentals; graphical, analytical, and numerical methods of seepage evaluation; seepage control and design; limit equilibrium and finite element stability methods.

CEE 6840 - Environmental Applications of Remote Sensing

Lec. 3. Cr. 3.

Prerequisite: CEE 4420 (5420) or consent of instructor. Theory and techniques of remote sensing and their application to environmental analysis. Microwave, infrared, passive and active techniques on orbiting and geostationary platforms. Multi-sensor analysis, current and planned satellite missions, radar altimetry, estimation of precipitation, soil moisture, discharge, land use and land cover. Scale and uncertainty issues.

CEE 6900 - Special Problems

Cr. 1-6.

Prerequisite: Consent of instructor. Investigation of a topic which is compatible with students' prerequisites, interests, and abilities.

CEE 6910 - CEE Graduate Seminar

Lec. 1. Cr. 1.

Prerequisite: CEE Graduate Standing. Seminar lectures and research presentations by invited speakers and graduate students in all fields of Civil Engineering. Course may be repeated for Ph.D. students. Only one (1) credit per semester may be earned.

CEE 6930 - Theory of Elasticity

Cross-listing: ME 6930

Lec. 3. Cr. 3.

Prerequisite: Consent of instructor. Fundamental laws of continuum mechanics; Cartesian tensors; analysis of stress and strain; two-dimensional problems in rectangular and polar coordinates; torsion of various shaped shafts.

CEE 6980 - Directed Study

Cr. 1-4 per semester.

CEE 6990 - Research and Thesis

Cr. 1,3,6,9.

CEE 7100 - Advanced Computational Methods in Engineering

Lec. 3. Cr. 3.

Prerequisite: CEE 6930/ME 6930 and an additional graduate level course in engineering mechanics or consent of instructor.

CEE 7200 - Surface Phenomena of Environmental Processes

Lec. 3. Cr. 3.

Prerequisite: CEE 6710 or consent of instructor. A study of the environmental significance of the physical and chemical processes which occur at the interface between two (2) phases.

CEE 7210 - Water Quality Aspects of Impoundment

Lec. 3. Cr. 3.

Prerequisite: Consent of instructor. Water quality changes and their causative mechanisms that occur in water stored and released from impoundments. Study of reservoir water quality models.

CEE 7220 - Finite Element Analysis for Flow in Porous Media

Lec. 3. Cr. 3.

Prerequisite: CEE 6720 or consent of instructor. Numerical analysis is discussed using applied finite element concepts. One- and two-dimensional applications are discussed for various aspects of mass diffusion, seepage, consolidation, and groundwater movement.

CEE 7300 - Natural Systems Engineering

Lec. 3. Cr. 3.

Prerequisite: CEE 6720 or consent of instructor. A study of treatment of wastes through engineered natural systems. Wetlands, lagoons, and land application.

CEE 7310 - Hazardous Waste Remediation in Groundwater and Soil

Lec. 3. Cr. 3.

Prerequisite: CEE 6720 or consent of instructor. A study of processes for the remediation of hazardous waste contamination in groundwater and in soil. Water-soil interactions and transport of pollutants.

CEE 7320 - Degradation of Waste Organics

Lec. 2. Lab. 3. Cr. 3.

Prerequisite: CEE 6760, CEE 6620, or consent of instructor. A study of physical, chemical, and biologically mediated degradation of waste organics. Emphasis is placed upon the catabolism of naturally occurring organic substrates in natural and engineered environments.

CEE 7360 - Advanced Topics in Prestressed Concrete Design

Lec. 3. Cr. 3.

Prerequisite: CEE 4360 (5360), CEE 6930, and consent of instructor. Advanced topics on analytical methods and design approaches of pre-tensioned and post-tensioned concrete members.

CEE 7410 - Advanced Travel Demand Modeling

Lec. 3. Cr. 3.

Prerequisite: CEE 6470. Theory of individual choice behavior. Binomial choice models. Multinomial choice models. Aggregate forecasting techniques. Aggregation and sampling of alternatives. Models of multidimensional choice. Transferability and updating of choice models.

CEE 7420 - Public Transportation

Lec. 3. Cr. 3.

Prerequisite: CEE 6470 or consent of instructor. Public transportation modes and characteristics, planning of public transportation networks, mathematical modeling of the demand for public transportation, and measurement of system performance.

CEE 7450 - Advanced Topics in Concrete Durability

Lec. 2. Lab. 2. Cr. 3.

Prerequisite: CEE 6300 or consent of instructor. Chemical and physical durability of Portland cement-based materials. Alkali-silica reaction, internal and external sulfate attack, permeability, shrinkage, freeze-thaw durability, and corrosion. Multi-scale (nano-, micro-, and macro-scale) investigations, including economical considerations, mitigation strategies, and advanced nano-/micro-structural characterization techniques.

CEE 7510 - Theory of Plates and Shells

Cross-listing: ME 7600

Lec. 3. Cr. 3.

Prerequisite: CEE 6930 or consent of instructor. Bending and buckling of thin plates and shells. Vibration analysis of plates and shells.

CEE 7520 - Fluvial Hydraulics

Lec. 3. Cr. 3.

Prerequisite: CEE 6520 or consent of instructor. Advanced topics; fundamental principles, theories, analytical and field methods applied in sediment transport mechanics, fluvial morphology and natural channel design and assessment.

CEE 7620 - Advanced Finite Element Analysis

Cross-listing: ME 7620

Lec. 3. Cr. 3.

Prerequisite: CEE 6350 or consent of instructor. Finite element analysis of coupled differential equations. Higher order and isoparametric element formulations. Applications to problems in heat transfer and fluid mechanics. Introduction to commercial programs.

CEE 7640 - Theory of Inelastic Material Behavior

Cross-listing: ME 7640

Lec. 3. Cr. 3.

Prerequisite: CEE 6930 or ME 6360. Constitutive equations for classical viscoelasticity. Exact solutions for simple constitutive laws. Incremental stress-strain relations for plasticity; yield surface and deformation theories. Application to engineering problems.

CEE 7650 - Continuum Theories of Materials

Cross-listing: ME 7650

Lec. 3. Cr. 3

Prerequisite: CEE 6930 or ME 6360 or consent of instructor. Continuum thermodynamics; balance laws and constitutive equations; applications for simple fluids, solids, thermoelastic solids, thermodiffusion and electrodynamics.

CEE 7710 - Fracture Mechanics

Cross-listing: ME 7660

Lec. 3. Cr. 3.

Prerequisite: CEE 6930. Griffith-Irwin Theory; stress intensity factors; crack tip stresses; plasticity; fatigue crack propagation; fracture toughness testing; experimental aspects; design applications; special topics.

CEE 7720 - Fiber-Reinforced Composite Materials

Cross-listing: ME 7670

Lec. 2. Lab. 2. Cr. 3.

Prerequisite: CEE 6930 or ME 6930. Properties of orthotropic lamina; micromechanics; classical lamination theory; lamina strength theories; laminate strength theories; failure theories, design criteria, 3-D lamination theory; analysis of laminated plate bending, vibration and buckling; and computational implementation.

CEE 7810 - Structural Dynamics

Lec. 3. Cr. 3.

Prerequisite: Consent of instructor. Vibration of single and multi degree-of-freedom systems; dynamic analysis of beams, frames and trusses; systems with distributed properties; discretization of continuous system and practical computer solutions.

CEE 7820 - Theory of Elastic Stability

Cross-listing: ME 7680

Lec. 3. Cr. 3.

Prerequisite: CEE 6930 or consent of instructor. Beams-columns; elastic buckling of bars and frames; torsional buckling of thin-walled structures; lateral buckling of beams; bending and buckling of thin plates and shells.

CEE 7910 - Study of Current Literature in Engineering Mechanics-Theories

Cr. 1.

Prerequisite: Graduate level standing within the College of Engineering and consent of instructor.

CEE 7911 - Study of Current Literature in Engineering Mechanics-Methods

Cr. 1.

Prerequisite: Graduate level standing within the College of Engineering and consent of instructor.

CEE 7912 - Study of Current Literature in Engineering Mechanics-Methods

Cr. 1.

Prerequisite: Graduate level standing within the College of Engineering and consent of instructor.

CEE 7970 - Selected Topics

Cr. 1-6.

CEE 7980 - Directed Study

Cr. 1-6.

CEE 7990 - Research and Dissertation

Cr. 1,3,6,9.

Communications

COMM 4030 (5030) - Event Management and Promotion

Lec. 3. Cr. 3.

Prerequisite: COMM 3030 or consent of instructor. This course will provide students with the opportunity to implement skills learned to manage and promote an actual event, either in pairs or small groups.

COMM 4430 (5430) - Interpersonal Communication

Lec. 3. Cr. 3.

Communication theory applied to informal and face-to-face situations. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

COMM 4620 (5620) - Advanced Public Speaking

Lec. 3. Cr. 3.

Prerequisite: SPCH 2410. Advanced oral communications as practiced from the platform, with emphasis on special types of speaking.

COMM 4630 (5630) - Persuasion

Lec. 3. Cr. 3.

Prerequisite: SPCH 2410 or consent of instructor. Promotes intellectual understanding and critical application of how individuals and groups influence the attitudes, beliefs, and behaviors of others. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

COMM 5410 - Organizational Communication

Lec. 3. Cr. 3.

Prerequisite: Graduate-level status or by permission of the instructor. An exploration of communication principles operant in modern organizations and approaches to the understanding of communicative culture in these organizations.

COMM 5420 - Advanced Organizational Communication

Lec 3. Credit 3.

COMM 5603 - Special Topics in Speech Communication

Lec. 3. Cr. 3.

Prerequisite: Graduate-level status. May be repeated to a maximum of nine (9) hours with change in course content. Presentation of directed, individual research in selected topics in speech communication beyond regular course offerings. Subjects will vary and will be specified at time of offering.

COMM 5610 - Special Topics

Lec. 1, 2, 3 Cr. 1, 2, 3

Seminar or lecture course on a selected topic, issue, or interest area in Communication Studies not covered in existing courses. Course may be repeated for credit under a different subtitle, up to nine hours of credit.

COMM 6110 - Leadership and Communication

Cross-listing: PRST 6110

Lec. 3 Credit 3.

This course focuses on leadership as a function of communication behavior. Through discussion, cases and exercises, participants will explore effective communication strategies within an organizational setting. The course will cover team leadership skills, rhetorical sensitivity, charisma and practical suggestions for improving leadership effectiveness.

COMM 6610 - Special Topics

Lec. 1, 2, 3 Cr. 1, 2, 3

Seminar or lecture course on a selected topic, issue, or interest area in Communication Studies not covered in existing courses. Course may be repeated for credit under a different subtitle, up to nine hours of credit.

COMM 6700 - Conflict Management and Negotiation

Cross-listing: PRST 6700

Lec. 3. Credit 3.

Negotiation and Conflict Management presents negotiation theory—strategies and styles—within an employment context. A different topic will be presented each week. In addition to the theory and exercises presented in class, students practice negotiating with role-playing simulations in threaded discussions and chat. Students also learn how to negotiate in difficult situations, which include abrasiveness, racism, sexism, whistle blowing, and emergencies. The course covers conflict management from two (2) perspectives. From a first party perspective you will be directly engaged. As a third party, you will develop and enhance your skills in helping others deal directly with their conflicts, mediation, investigation, arbitration, and helping the system change as a result of a dispute.

COMM 6998 - Professional Project

Cross-listing: PRST 6998 JOUR 6998

LEC. 3. CREDIT 3.

The Professional Project is the last requirement for the MPS Degree, serving as the integrative culmination of the program of study. It should be a substantial piece of independent research or a significant professional project that is logically consistent with the theme and content of the program of study. Student's work should demonstrate familiarity with and understanding of a body of professional literature related to a specific topic. The Project should grow out of the program of study and should demonstrate the student's ability to use the knowledge gained from this program of study.

Computer Science

CSC 4010 (5010) - Programming Languages

Lec. 3. Cr. 3.

Prerequisite: CSC 2710, 3410. Concepts distinguishing modern programming languages with emphasis on language design, implementation, and run-time behavior. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CSC 4020 (5020) - Compiler Construction

Lec. 3. Cr. 3.

Prerequisite: CSC 2710, 3410. Programming language translator design with emphasis on design concepts, parsing, code generation, tools, and code improvement; construction of a small compiler. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CSC 4100 (5100) - Operating Systems

Lec. 3. Cr. 3.

Prerequisite: Grade of 'C' or better in CSC 2110, CSC 2111 and either 'C' or better in CSC 3410 or ECE 3120. An historical perspective of operating systems; overview of modern systems; processor, storage and process management; virtual memory; deadlocks; concurrent processing and programming; protection; case studies. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CSC 4200 (5200) - Computer Networks

Lec. 3. Cr. 3.

Prerequisite: CSC 2400 Data communications and computer networks; network models and protocols; local area networks; data security. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CSC 4220 (5220) - Data Mining and Machine Learning

Lec. 3. Cr. 3.

Prerequisite: Grade of C or better in CSC 2400 and CSC 3220. Introduction to basic machine learning concepts, as well as practical advice on applying machine learning tools and techniques in real-world data mining situations, including preparing inputs, interpreting outputs, evaluating results, and the core algorithmic methods for successful data mining. The course will also introduce students to the latest advances in the field, including data transformations, ensemble learning, massive data sets, and multi-instance learning, with an application towards the leading edge of contemporary research.

CSC 4240 (5240) - Artificial Intelligence

Lec. 3. Cr. 3.

Prerequisite: CSC 2400, CSC 2710. A unified survey of AI methods and applications; search and problem solving; knowledge representation; methods of reasoning, planning, and uncertainty; learning, perception, and communication; rational agents. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CSC 4260 (5260) - Advanced Data Science and Applications

Lec. 3. Credit 3.

Prerequisite: CSC 3220, CSC 3300, and MATH 2010. Project-oriented course that exposes the students to advanced data science topics and the real-world application of data science. Students will learn MapReduce/Hadoop, advanced visualization techniques, and a variety of data acquisition tools. Students will also explore issues surrounding data management and data privacy. In addition, students will complete a data science capstone project connected by a theme selected by the instructor, immersing students in the data science exploration of topics in areas such as healthcare, sports, cybersecurity. The course requires students to put into practice advanced data science techniques that address the full data science life-cycle.

CSC 4320 (5320) - Computer Architecture

Lec. 3. Cr. 3.

Prerequisite: Grade of 'C' or better in CSC 3410 or equivalent. Computer systems, the CPU, the control unit, microprogramming, parallel organization, RISC architectures. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CSC 4400 (5400) - Analysis of Algorithms

Lec. 3. Cr. 3.

Prerequisite: CSC 2400. Analysis techniques; search, traversal, string, and graph algorithms; NP-hard and NP-complete problems. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CSC 4450 (5450) - Introduction to Automata Theory and Computation

Lec. 3. Cr. 3.

Prerequisite: CSC 2710. CSC 2400 recommended. Finite automata; regular sets; context-free languages; pushdown automata; Turing machines; recursive languages; computability; computational complexity. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CSC 4570 (5570) - IT Security

Lec. 3. Cr. 3

Prerequisite: Consent of instructor. This course covers the fundamentals of computer security needed for IT professionals. It is an overview of various management and administrative aspects of IT Security and introduces students to threats and security issues in typical IT infrastructure and protection mechanisms. The course is split into two parts: IT Sec Management and Administration. Course requires semester wide effort in cyber assessment project for real world IT environment.

CSC 4575 (5575) - Cryptography and Network Security

Lec. 3. Cr. 3.

Prerequisite: Junior standing and 'C' or better in CSC 2110, CSC 2111. Course introduces students to the fundamentals of information assurance and cryptographic techniques along with their application to the prevention, detection, and mitigation of cyber threats. Students enrolled in 5000-level course will be required to complete additional work as stated in the syllabus.

CSC 4580 (5580) - Software Reverse Engineering

Lec. 3. Cr. 3.

Prerequisite: Grade of C or better in CSC 2400. Basic concepts of reverse engineering and general techniques used for reverse engineering. Reverse engineering applied to basic static and dynamic analysis of executables, and hands-on exercises using software analysis tools and best practices. Additional topics may include the study of malware behavior and techniques that malware uses to thwart detection and analysis.

CSC 4710 (5710) - Design and Development of Human and Web Interfaces

Lec. 3. Cr. 3.

Prerequisite: C or better in CSC 2110, CSC 2111, CSC 3030 or CSC 3040. A course in human-computer interaction design and user interface development. It will expose students to tools, techniques, and ideas for designing effective human computer interfaces and discuss practical and legal aspects of accessibility. Graduate students will be required to do additional work on their projects (more functionality) and/or answer additional questions on tests and quizzes. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CSC 4760 (5760) - Parallel Programming

Lec. 3. Cr. 3.

Prerequisite: CSC 2400, CSC 2500 or consent of instructor. Foundations of parallel programming including parallel computer architectures, principles of parallel algorithm design, programming models for shared and distributed-memory systems, along with GPGPU. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CSC 4770 (5770) - Distributed and Cloud Computing

Lec. 3. Cr. 3.

Prerequisite: CSC 2400 or consent of instructor (graduate). This course will cover the concepts in distributed systems including distributed computing, networking, operating systems, cloud, and programming languages. Furthermore, it will examine current applied topics in distributed systems.

CSC 4800 (5800) - Directed Readings in Computer Science

Cr. 3.

Prerequisite: Consent of instructor. This course provides for individual study under the direction of a faculty member in developing areas of computer science. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CSC 4901 (5901) - Special Topics

Cr. 1-3.

Prerequisite: Consent of instructor. Timely topics in computer science. May be taken multiple times, provided the topic is different. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CSC 4902 (5902) - Special Topics

Cr. 1-3.

Prerequisite: Consent of instructor. Timely topics in computer science. May be taken multiple times, provided the topic is different. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CSC 4903 (5903) - Special Topics

Cr. 1-3.

Prerequisite: Consent of instructor. Timely topics in computer science. May be taken multiple times, provided the topic is different. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CSC 5585 - Software and Systems Security

Lec. 3. Cr. 3.

Prerequisite: Enrolled in the graduate Computer Science program or consent from the instructors. This Software and Systems Security course will integrate and implement modern secure software engineering practices into the Computer Science (CS) curriculum. The novelty of the proposed course into the existing CS curriculum is the integration of state-of-the art software engineering best practices with security engineering, such as automated testing and automated vulnerability assessment.

CSC 5750 - Computer Graphics

Lec. 3. Cr. 3.

Prerequisite: MATH 2010 and "C" or better in CSC 2400. Interactive graphical techniques including three-dimensional transformations, hidden surface removal, texture mapping, and shading.

CSC 6220 - Data Mining

Lec. 3. Cr. 3.

Prerequisite: CSC 4240 (5240) or consent of instructor. Preparing data for mining using preprocessing, data warehouses, and OLAP; data mining techniques, including association rule mining, classification/prediction and cluster analysis; study of recent techniques and issues.

CSC 6230 - Machine Learning

Lec. 3. Cr. 3.

Prerequisite: CSC 4240 (5240) or equivalent. Introduction to machine learning techniques, such as decision tree induction, k-nn classifiers, and clustering. Emphasis on supervised learning, including classification techniques, feature selection, and evaluation techniques. Unsupervised and reinforcement learning will also be covered.

CSC 6240 - Mathematics and Theory of Machine Learning

Lec. 3. Cr. 3.

Prerequisite: Consent of instructor. The purpose of this course is to gain a deeper understanding of the foundational mathematics and theory of machine learning. We will cover a number of mathematical topics that underpin the thinking behind and implementation of machine learning, including topics from linear algebra, probability and statistics, multivariate calculus, information theory, algorithmic analysis, and algorithmic complexity. This includes mathematical frameworks for learning, algorithms for learning concept classes with an emphasis on proving bounds on the resources (time, space, sample complexity) required by these algorithms, and methods for proving the intractability of certain learning tasks.

CSC 6250 - Knowledge-Based/Expert Systems

Lec. 3. Cr. 3.

Prerequisite: CSC 4240 (5240) or consent of instructor. Knowledge-based systems and logic programming, methods of knowledge representation, and inference. Applications to expert systems and intelligent data bases.

CSC 6260 - Advanced Topics in Artificial Intelligence

Lec. 3. Cr. 3.

Prerequisite: CSC 4240 (5240). This course will cover a variety of selected topics from the field of artificial intelligence, and their application. Possible topics include advanced pattern recognition, neural networks, expert systems, image processing, and natural language processing.

CSC 6300 - Web-Based Database Systems

Lec. 3. Cr. 3.

Prerequisite: CSC 4300 (5300) or consent of instructor. Advanced concepts in designing database applications, techniques for data storage and retrieval in large databases, etc.

CSC 6320 - Advanced Computer Architecture

Lec. 3. Cr. 3.

Prerequisite: CSC 4100 (5100), CSC 4320 (5320), or consent of instructor. Analysis and design of large-scale computer systems, such as pipelined and vector architectures, etc.

CSC 6400 - Advanced Analysis of Algorithms

Lec. 3. Cr. 3.

Prerequisite: CSC 4200 (5200) and CSC 4400 (5400). Algorithmic analysis techniques and their application to a wide variety of both fundamental and advanced algorithms with an emphasis on formal techniques; complexity classes; and approximation algorithms.

CSC 6450 - Advanced Theory of Computation

Cross-listing: MATH 6450

Lec. 3. Cr. 3.

Prerequisite: Consent of the instructor (previous coursework involving proofs and some programming experience are needed). A rigorous treatment of the theory of computation. Topics such as: computable functions, the Church-Turing thesis, complexity theory, and P vs NP.

CSC 6460 - Computational Methods for Graphics and Modeling

Cross-listing: MATH 6460

Lec. 3. Cr. 3.

Prerequisite: Consent of the instructor (previous coursework involving proofs and some programming experience are needed). Mathematical methods for graphics and modeling. Topics such as: 3-D transformations, ray tracing, rendering, image processing, and compression.

CSC 6570 - Cloud Security Fundamentals and Practice

Lec. 3 Cr. 3

The course will discuss the fundamentals of cloud computing, architecture and explore the guiding security design and development principles, security patterns, industry standards, applied technologies and addressing regulatory compliance requirements critical to design, implement, deliver and manage secure cloud-based services. The topics may include but are not limited to Cloud Computing and Internet of Things fundamentals, architectures and security challenges, distributed systems security, formal models for computer security, Security mechanisms in state-of-the-art cloud providers including AWS, Google Cloud, Azure, privacy and ethics, virtual objects or device shadows (Digital Twins) critical infrastructure protection, malware analysis using machine learning, Zero Trust, federated architectures, containers, network security protocols.

CSC 6575 - Internet Security

Lec. 3. Cr. 3.

Prerequisite: CSC 4575 (5575) or consent of instructor. Network and web-based application security issues, such as encryption and decryption, security protocols, digital signatures, etc.

CSC 6580 - Advanced Reverse Engineering

Lec. 3. Cr. 3.

Prerequisite: Grade of C or better in CSC 4580/5580. Review of basic concepts of reverse engineering and general techniques used for reverse engineering, and study of advanced techniques of reverse engineering, which may include techniques for detection and analysis of malware and the study of self-modifying malware and obfuscation techniques.

CSC 6585 - Secure Software Development

Lec. 3. Cr. 3.

This course will teach students about the design and development of secure software such that insecure coding patterns and security misconfigurations are mitigated early in the software life cycle. Students will learn about different types of insecure configurations, coding patterns, and vulnerabilities. They will also get hands-on experience on program analysis techniques, such as fuzzing and static analysis. Furthermore, they will learn about requirements analysis and design of secure software. Upon completion of the course, students will be able to develop their own program analysis tools, which will apply software security knowledge to test systems for security vulnerabilities.

CSC 6720 - Internet Protocols

Lec. 3. Cr. 3.

Prerequisite: CSC 4010 (5010), CSC 6700, or consent of instructor. A detailed introduction to languages, methods, and techniques involved in programming web-based applications, including associated paradigms for web-based development environments and applications, including operating systems related issues.

CSC 6730 - Advanced Networking

Lec. 3. Cr. 3.

Prerequisite: CSC 4200 (5200). Computer network protocols that are usually beyond the scope of a standard course in computer networks. Wireless networks and multimedia networks, advanced topics on network protocols, and readings on selected research papers will be discussed.

CSC 6740 - Parallel and Distributed Algorithms

Lec. 3. Cr. 3.

Prerequisite: CSC 4760 or CSC 5760 or consent of the instructor. Design and analysis of parallel and distributed algorithms for modern parallel and distributed architectures.

CSC 6760 - Grid Computing

Lec. 3. Cr. 3.

Prerequisite: CSC 4200 (5200). Evolution of Grid Computing and its relationship to Cluster Computer, Distributed Computing, Internet Computing, and Peerto-Peer Computing. Technologies and architectures used to develop Grids test-bed projects using the Globus Toolkit and other software packages. Focus on understanding the different Grid technologies and architectures, such as the Open Grid Specification Architecture (OGSA) and developing higher-level tools using these technologies.

CSC 6770 - Service-Oriented Computing

Lec. 3. Cr. 3.

Prerequisite: CSC 6720. Advanced concepts in service-oriented computing. Current technologies for designing large scale web services, as well as utilizing enterprise services by combining web services, including transaction management, service discovery, communication, coordination of web services, and collaboration between web services.

CSC 6780 - Distributed Computing

Lec. 3. Cr. 3.

Prerequisite: CSC 4100 Theories, principles, and practices relevant to the design of distributed systems including synchronization, naming, replication, and consistency, file system and security.

CSC 6801 - Directed Independent Study

Cr. 1.

Prerequisite: Consent of Instructor Engage student in independent learning on a selected topic under the guidance of an instructor.

CSC 6802 - Directed Independent Study

Cr. 2.

Prerequisite: Consent of instructor. Engage student in independent learning on a selected topic under the guidance of an instructor.

CSC 6803 - Directed Independent Study

Cr. 3.

Prerequisite: Consent of instructor Engage student in independent learning on a selected topic under the guidance of an instructor.

CSC 6901 - Advanced Topics in Computer Science

Lec. 1. Cr. 1.

Consent of instructor Advanced topics in computer science. May be repeated for credit if the topic is different.

CSC 6902 - Advanced Topics in Computer Science

Lec. 2. Cr. 2.

Prerequisite: Consent of instructor Advanced topics in computer science. May be repeated for credit if the topic is different.

CSC 6903 - Advanced Topics in Computer Science

Lec. 3. Cr. 3.

Prerequisite: Consent of instructor Advanced topics in computer science. May be repeated for credit if the topic is different.

CSC 6910 - Computer Science Seminar

Cr. 1.

CSC 6980 - Masters Project

Cr. 3.

Prerequisite: Consent of instructor. This course is a requirement for graduate students pursuing the project option. The course is directed by the student's graduate advisor(s).

CSC 6990 - Research and Thesis

Cr. 1,3,6.

CSC 7210 - Anomaly and Intrusion Detection Systems

Lec. 3. Cr. 3.

Prerequisite: CSC 6220 or CSC 6230. Traditional intrusion and anomaly detection systems, as well as current advances in this ever-growing field. The application of anomaly detection to a wide-range of domains, including fraud, insider threats, and time-series data will be investigated in-depth, as well as network attacks and the systems for detecting oddities such as network intrusions and denial of service attacks. This course will not only cover the subjects through readings, but also through hands-on experience.

CSC 7240 - Intelligent Information Systems

Lec. 3. Cr. 3.

Prerequisite: CSC 6220 or CSC 6230. Combines fundamental research in artificial intelligence with application-orientated research in knowledge discovery, decision-support systems, and adaptive computing.

CSC 7560 - Advanced Networking and Next Generation Internet Protocols

Lec. 3 Cr. 3

The proposed Advanced Networking and Next Generation Internet Protocols course will teach students about the

Internet and the technologies and protocols that build it. This class will draw on the past to project on the future of the Internet. By studying the seminal works of the Internet pioneers, the students will understand the rationale behind the design of the Internet, how the massive success of the Internet has exposed its architectural shortcomings, and understand the future research directions that address these challenges. They will pick a real-world problem in consultation with the instructor and utilize cutting-edge networking to solve it.

CSC 7570 - Artificial Intelligence Assisted Cyber Security

Lec. 3 Cr. 3

This course introduces graduate students to the research challenges and opportunities at the intersection of cybersecurity and artificial intelligence (AI). It focuses on a range of topics and research in the areas of malware, access control, federated learning, and adversarial attacks. Students will learn and have some hands-on experience in cutting edge research in these topics, particularly in malware analysis, read peer reviewed papers and analyze them. The main objective is to have students read peer-reviewed papers to gain an understanding of the practice and state of the art of AI for cybersecurity solutions, work in groups to analyze and critique scholarly articles, and spark new research ideas for their research work.

CSC 7575 - Security Topics in Cyber-Physical Systems

Lec. 3. Cr. 3.

Prerequisite: Consent of instructor. Timely topics related to security issues, concerns and trends in the modern power grid including threats of and protection for the IT/computer layer of the seven smart grid conceptual framework domains such as bulk generation, customer, distribution, markets, operations, service provider, and transmission.

CSC 7720 - Distributed Operating Systems

Lec. 3. Cr. 3.

Prerequisite: CSC 6720. Computer operating systems that run on multiple, independent central processing units but appear to the user as an ordinary centralized operating system. Principles, design, and implementation of distributed operating systems, including network technologies, synchronization, distributed resource management, distributed process management, security, and distributed file systems.

CSC 7730 - Autonomic Computing

Lec. 3. Cr. 3.

Prerequisite: CSC 6780 or CSC 6730. Introduces principles, key concepts, and proposed methodologies underlying the design and engineering of autonomic computing and networking (AC) systems of autonomic computing systems. Investigates the origins, goals, and promises of autonomic computing. Includes complexity of autonomic computing, architecture, algorithms, enabling technology and development tools for autonomic computing.

CSC 7750 - High Performance Computing

Lec. 3. Cr. 3.

Prerequisite: CSC 6740 or consent of instructor. Introduces principles, key concepts, and proposed methodologies used in advanced high performance computing. The future of high performance computing is in exploiting the ever-increasing levels of parallelism. This course will investigate the origins, goals, and techniques of these distributed and parallel systems. The course content will include the architecture, algorithms, techniques, and enabling technology and development tools for high performance computing.

CSC 7970 - Selected Topics

Cr. 1-6.

CSC 7980 - Directed Study

Cr. 1-6.

CSC 7990 - Research and Dissertation

Cr. 1, 3, 6, 9.

Computer Science Education

CSED 6000 - Digital Literacy and Computing

Lec. 3. Cr. 3.

This course teaches students the ability to identify, find, evaluate and use computer science technologies for teaching and learning. This course will consist of modules related to hardware and operating systems, data abstraction, cyber security and internet privacy, digital literacy, information literacy, and digital artifact design. Foundational theories and relevant literature regarding digital literacy and learning will be explored and analyzed. Concurrently, K-12 teaching methodologies related to these topics will be explored and discussed.

CSED 6010 - Programming Fundamentals and Computational Thinking for Educators

Lec. 3. Cr. 3.

Prerequisite: Full admission to the Teacher Education Program. This course introduces the foundational building blocks of programming, including primitive data types, functions, algorithms, flow charts, common searching, basic data structures, and control structures. Computational thinking concepts will be defined and examined within programming languages. Computational thinking theoretical frameworks and relevant block-based programming literature will be analyzed and applied to teaching practice. Practicum embedded in course. A grade of B is required to meet requirements for licensure candidates.

CSED 6020 - Computer Science Concepts and Design

Lec. 3. Cr. 3.

This course covers the writing, modifying, and analyzing of text-based programming for teachers. Analysis of correctness, extensibility, modifiability and reusability of code will be completed. The three major programming structures (sequence, conditionals, and iteration) will be investigated and practiced. Low vs. high level programming languages will be explored. Learners will ground programming procedures with theory in order to conceptualize their practice.

CSED 6030 - Computer Science Instructional Methods

Lec. 3. Cr. 3.

This course offers an examination and application of curricular issues, learning theories, pedagogical methods, and assessments for teaching K-12 computer science in multicultural and diverse classrooms. Comprehensive K-8 or 9-12 computer science lesson plans will be collaboratively developed. The fundamental intersections between computer science and other K-12 disciplines for the purpose of teaching will be investigated. Learners will propose an educational research plan themed around computer science integration.

Cooperative Education

COOP 5010 - Co-op Off-Campus Assignments

Cr. 1.

Prerequisite: The individual must have been a fulltime Tennessee Tech graduate student in good standing the prior term. Selections are made by the employer in conjunction with the Office of Career Services. Co-op assignment is full-time, degree-related employment. One (1) hour credit granted per semester; total work experiences must not exceed 24 months. Credit earned will not decrease the normal minimum requirements of a student's program of study. A written report is required each semester from the student. The student's academic advisor evaluates the report and forwards it to the Office of Career Services. A grade of S (satisfactory) or U (unsatisfactory) will be reported for the student to the Records Office.

COOP 5020 - Co-op Off-Campus Assignments

Cr. 1.

Prerequisite: The individual must have been a fulltime Tennessee Tech graduate student in good standing the prior term. Selections are made by the employer in conjunction with the Office of Career Services. Co-op assignment is full-time, degree-related employment. One (1) hour credit granted per semester; total work experiences must not exceed 24 months. Credit earned will not decrease the normal minimum requirements of a student's program of study. A written report is required each semester from the student. The student's academic advisor evaluates the report and forwards it to the Office of Career Services. A grade of S (satisfactory) or U (unsatisfactory) will be reported for the student to the Records Office.

COOP 5030 - Co-op Off-Campus Assignments

Cr. 1.

Prerequisite: The individual must have been a fulltime Tennessee Tech graduate student in good standing the prior term. Selections are made by the employer in conjunction with the Office of Career Services. Co-op assignment is full-time, degree-related employment. One (1) hour credit granted per semester; total work experiences must not exceed 24 months. Credit earned will not decrease the normal minimum requirements of a student's program of study. A written report is required each semester from the student. The student's academic advisor evaluates the report and forwards it to the Office of Career Services. A grade of S (satisfactory) or U (unsatisfactory) will be reported for the student to the Records Office.

COOP 5040 - Co-op Off-Campus Assignments

Cr. 1.

Prerequisite: The individual must have been a fulltime Tennessee Tech graduate student in good standing the prior term. Selections are made by the employer in conjunction with the Office of Career Services. Co-op assignment is full-time, degree-related employment. One (1) hour credit granted per semester; total work experiences must not exceed 24 months. Credit earned will not decrease the normal minimum requirements of a student's program of study. A written report is required each semester from the student. The student's academic advisor evaluates the report and forwards it to the Office of Career Services. A grade of S (satisfactory) or U (unsatisfactory) will be reported for the student to the Records Office.

COOP 5070 - Co-op Off-Campus Assignments

Cr. 1.

Prerequisite: The individual must have been a fulltime Tennessee Tech graduate student in good standing the prior term. Selections are made by the employer in conjunction with the Office of Career Services. Co-op assignment is full-time, degree-related employment. One (1) hour credit granted per semester; total work experiences must not exceed 24 months. Credit earned will not decrease the normal minimum requirements of a student's program of

study. A written report is required each semester from the student. The student's academic advisor evaluates the report and forwards it to the Office of Career Services. A grade of S (satisfactory) or U (unsatisfactory) will be reported for the student to the Records Office.

COOP 5080 - Co-op Off-Campus Assignments

Cr. 1.

Prerequisite: The individual must have been a fulltime Tennessee Tech graduate student in good standing the prior term. Selections are made by the employer in conjunction with the Office of Career Services. Co-op assignment is full-time, degree-related employment. One (1) hour credit granted per semester; total work experiences must not exceed 24 months. Credit earned will not decrease the normal minimum requirements of a student's program of study. A written report is required each semester from the student. The student's academic advisor evaluates the report and forwards it to the Office of Career Services. A grade of S (satisfactory) or U (unsatisfactory) will be reported for the student to the Records Office.

Counseling

COUN 6000 - Counseling Across the Lifespan

Lec. 3. Cr. 3.

This course will focus on central issue sand counseling strategies related to human development that arise across the lifespan. Course will evaluate the continuity and change occurring within the developing individual in cognitive, social, emotional and physical domains from birth to death. Course will satisfy both national accreditation and state licensing requirements.

COUN 6300 - Introduction to Counseling: Foundations, Ethics, and Legal Issues

Lec. 3. Cr. 3.

Introductory course for all counseling majors. Overview of philosophy, basic elements, ethics, and principles of counseling. Knowledge of ethical standards of practice and legal issues in counseling.

COUN 6320 - Group Counseling

Lec. 3. Cr. 3.

Prerequisite: COUN 6300 , COUN 6360, and COUN 6362. Introductory course in group counseling; objectives, principles, and techniques of group counseling.

COUN 6330 - Organization and Administration in School Counseling Programs

Lec. 3. Cr. 3.

Major principles of sound administrative practice and organization of school counseling services.

COUN 6335 - Professional Issues in the Educational Settings

Lec. 3. Cr. 3.

This course will focus on the development of skills and strategies to address professional issues in the PreK-12 school setting. Personal teaching philosophies, strategies for conceptualization, curriculum development, evaluation and didactic skills will be learned and demonstrated by students planning to combine teaching and counseling in the school setting.

COUN 6360 - Counseling Skills

Lec. 3. Cr. 3.

Study and practical application of basic counseling skills, including, but not limited to the following skills: listening, attending and rapport building.

COUN 6362 - Counseling Theories

Lec. 3. Cr. 3.

Study and application of basic counseling theories, including, but not limited to the following major theories: Cognitive/Behavioral, Psychoanalytic, Existential/Humanistic, and Postmodern theories of counseling.

COUN 6370 - Family Counseling

Lec. 3. Cr. 3.

Introduction to family systems and techniques of family counseling.

COUN 6380 - Multicultural Counseling

Lec. 3. Cr. 3.

Study of a broad range of counseling behavior and psychological principles in the therapeutic relationship as they relate to individuals from different ethnic and cultural backgrounds.

COUN 6385 - Counseling Children and Adolescents

Lec. 3. Cr. 3.

This course will focus on specific counseling strategies related to children and adolescents. Cognitive, social, emotional and physical domains of this populations will be examined with assessment, preliminary diagnosis and treatment options for individuals as primary issues. Course will satisfy both national accreditation and state licensing requirements.

COUN 6410 - Career Counseling and Development

Lec. 3. Cr. 3.

Types of information for counseling; community resources; principles and techniques of career planning.

COUN 6430 - Neuroscience for Counselors

Lec 3. Cr. 3.

The purpose of this course is to provide students with an overview of the structure and function of the human brain, including how the human brain influences and is influenced by biology, environment, and experiences. Using this information, students will be better equipped to a) evaluate popular publications related to brain wellness and psychological disorders, and b) intervene in strategic and appropriate ways.

COUN 6460 - Addiction Counseling

Lec. 3. Cr. 3.

Focus on the abuser, the abuser's environment, and strategies for rehabilitation.

COUN 6500 - Play Therapy

Lec. 3. Cr. 3.

Theories and techniques of play therapy.

COUN 6550 - Spirituality in Counseling

Lec. 3. Cr. 3.

Developing competencies for addressing spiritual and religious issues in counseling.

COUN 6630 - Theories of Personality

Lec. 3. Cr. 3.

Major theoretical treatments of personality development and structure with emphasis upon generated psychological research.

COUN 6670 - Assessment in Counseling

Lec. 3. Cr. 3.

This course will focus on the variety of assessment instruments utilized by counseling and psychology professionals and their role in making appropriate recommendations and planning for treatment.

COUN 6680 - Trauma, Grief, and Crisis Counseling

Lec. 3. Cr. 3.

Prerequisite: COUN 6670 - Assessment in Counseling This course will focus on risk assessment, safety planning, preliminary intervention and follow up planning relevant to crises occurring in the helping professions. Course will satisfy both national accreditation and state licensing requirements.

COUN 6800 - Practicum

Cr. 3.

Prerequisite: COUN 6300, COUN 6320, COUN 6360 COUN 6362, COUN 7600 Supervised practice in counseling; application of theories, principles, and practices; development of counseling techniques. Pass or fail.

COUN 6820 - Internship in Mental Health Counseling

Cr. 3, 6.

Supervised experience in an appropriate community mental health placement. Students must complete 300 hours of supervised mental health counseling work experience. Students must take COUN 6821 after completing COUN 6820. Pass or fail.

COUN 6821 - Internship in Mental Health Counseling

Cr. 3, 6.

Prerequisite: COUN 6820. Supervised experience in an appropriate community mental health placement. Students must complete 300 hours of supervised mental health counseling work experience. Pass or fail.

COUN 6830 - Internship in School Counseling

Cr. 3, 6.

Prerequisite: COUN 6320, COUN 6360, and COUN 6362. Supervised experience in an appropriate school placement. Pass or fail.

COUN 7300 - Seminar in Counseling

Cr. 3.

Prerequisite: Advanced graduate standing and permission of instructor. A critical study of current issues in counseling.

COUN 7320 - Advanced Group Counseling in Addiction and Special Populations

Lec. 3. Credits. 3.

Prerequisite: Permission of Director of Doctoral Studies. Clinical skills needed in working with addiction treatment modalities and other treatment modalities associated with specialized populations.

COUN 7360 - Couples Counseling

Prerequisite: Admission to a licensure track program in Counseling and Psychology Graduate Programs. This course focuses on evidenced-based therapeutic interventions and techniques specifically used in treating couples.

COUN 7370 - Counseling Supervision

Lec. 3. Cr. 3.

Prerequisite: Permission of Director of Doctoral Studies. Explores the purposes, theoretical frameworks, models, and skills related to counseling supervision. Also addresses legal, ethical, and culturally relevant issues. The course includes practice learning and opportunities to develop a personal style of supervision.

COUN 7400 - Advanced Counseling Practicum

Lec. 3. Credits. 3.

Prerequisite: Permission of the instructor. An advanced counseling experience in a therapeutic field placement which is relevant to the students' professional goals. The setting, goals, site supervisor, and plan for the practicum experience must be approved by the faculty instructor. Students receive weekly supervision from their site supervisor and group supervision from a counselor education faculty member.

COUN 7500 - Research, Scholarship, and Publication

Lec. 3. Credits. 3.

Prerequisite: Permission of Director of Doctoral Studies. Exploration of emergent research practices and processes, professional writing and conference proposal preparation, and ethical and culturally relevant strategies for conducting research.

COUN 7510 - Counseling Administration and Program Evaluation

Lec. 3. Credits. 3.

Prerequisite: Master's degree and permission of the instructor. An exploration of theories and practice of program evaluation and knowledge of accreditation standards and processes in counseling. Students will also participate as full members of a research team and assist with program evaluation or the design of the study.

COUN 7600 - Diagnosis and Treatment

Lec. 3. Cr. 3.

Focus on diagnosis, etiology, treatment options and the assessment of mental disorders.

COUN 7610 - Teaching in Counselor Education

Lec. 3. Credits 3.

Prerequisite: Permission from instructor. An introduction to the major roles, responsibilities, and activities of counselor educators. Includes instructional theory and methods, and addresses the ethical, legal, and culturally relevant issues associated with counselor preparation training.

COUN 7700 - Advanced Multicultural Counseling: Leadership and Advocacy

Lec. 3. Credit. 3.

Prerequisite: Permission of Director of Doctoral Studies. Theories and skills of leadership, advocacy models, and culturally relevant issues. Exploration of current topical and political issues in counseling and how these issues affect the counseling profession. The course also includes practice in developing leadership and advocacy skills.

COUN 7730 - Qualitative Research Methods in Counseling

Lec. 3. Credits. 3.

Prerequisite: Permission of Director of Doctoral Studies. Development of skills necessary to understand, interpret, and conduct qualitative research in counseling.

COUN 7740 - Advanced Quantitative Inquiry and Research Design

Lec. 3. Credit. 3.

Prerequisite: Permission of the Director of Doctoral Studies. An in-depth analysis of various forms of quantitative research.

COUN 7750 - Advanced Qualitative Inquiry and Research Design

Lec. 3. Credits. 3.

Prerequisite: Permission of Director of Doctoral Studies. An in-depth analysis of various forms of qualitative research.

COUN 7820 - Doctoral Internship

Lec. 3. Credits. 3.

Prerequisite: Permission of Director of Doctoral Studies. May be repeated. Supervised experiences in counseling and supervision (e.g., clinical practice, supervision, research and scholarship, teaching, and/or leadership and advocacy).

COUN 7830 - Internship in School Counseling

Cr. 3, 6.

Prerequisite: COUN 6320, COUN 6360, and COUN 6362. Supervised experience in an appropriate school setting. Pass or fail.

COUN 7840 - Regional Mental Health and Addiction Services

Lec. 3. Credits. 3.

Prerequisite: Permission of Director of Doctoral Studies. Exploration of challenges specific to rural, special, and underserved populations with mental health and substance abuse treatment services.

COUN 7940 - Professional Accountability

Lec. 3. Cr. 3.

Offers the emerging professional an opportunity to become familiar with the various uses of data and how to collect, analyze, interpret, report and utilize information. Assist the student in developing effective and legal/ethical critical thinking and problem solving skills, by offering real world situations for examination. Meets an identified state licensing requirement for school and agency concentrations.

COUN 7970 - Directed Experience in Counseling Research

Lec. 3. Credits. 3.

Prerequisite: Permission of Director of Doctoral Studies. Research experience under the supervision of a faculty member.

COUN 7970 - Directed Experience in Counseling Research

Lec. 3. Credits. 3.

Prerequisite: Permission of Director of Doctoral Studies. Research experience under the supervision of a faculty member.

COUN 7970 - Directed Experience in Counseling Research

Credits. 3.

Prerequisite: Permission of Director of Doctoral Studies. Research experience under the supervision of a faculty member.

COUN 7990 - Dissertation Research

Credits. 1-9 variable credit hours.

May be repeated. A minimum of 6 hours over two semesters is required. Enrollment is restricted to students who have successfully completed comprehensive examinations. Dissertation work under direction of dissertation committee.

Criminal Justice

CJ 4010 (5010) - Organized Crime

Cross-listing: SOC 4010 (5010)

Lec. 3. Cr. 3.

Prerequisite: SOC 1010 or 1100 or consent of instructor. Organized crime in America as a product of legal, historical, cultural and economic forces. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CJ 4040 (5040) - Law and Culture (Anthropology)

Cross-listing: SOC 4040 (5040)

Lec. 3. Cr. 3.

Prerequisite: SOC 1010 or 1100 or consent of instructor. A comparative cross-cultural analysis of primitive,

traditional, and modern attitudes toward law, social control, punishment, and individual responsibility. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CJ 4100 (5100) - Probation and Parole

Lec. 3. Cr. 3.

Probation and parole services with special attention to current practices and issues. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CJ 4120 (5120) - Treatment Methods

Lec. 3. Cr. 3.

Individual and group methods used in counseling and treating offenders in both the institutional and community setting. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CJ 4250 (5250) - Drugs and Behavior

Lec. 3. Cr. 3.

Relationships between drugs or drug groupings and human behavior, including toxicity, behavioral symptoms and historical aspects of drug abuse. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CJ 4660 (5660) - Corrections

Cross-listing: SOC 4660 (5660)

Lec. 3. Cr. 3.

Prerequisite: SOC 1010 or 1100 or consent of instructor. Correctional services, practices and issues with particular attention to the maximum security adult institution. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CJ 4700 (5700) - Independent Study

Cr. 1-3.

Prerequisite: Consent of instructor. Allows the student to undertake study in an area of criminology or criminal justice where there is no appropriate course. May be taken twice, provided that the topic is different. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CJ 4900 (5900) - Internship in Criminal Justice

Cr. 3.

Prerequisite: 9 hours of sociology. See instructor prior to enrolling. Students are placed with and work in a public or private agency which is compatible with their interests. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CJ 4970 (5970) - Special Topics

Cr. 1-3.

Prerequisite: Consent of instructor. Seminar or lecture course on a selected topic, issue, or interest area in criminology or criminal justice. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CJ 4980 (5980) - Special Topics

Cr. 1-3.

Prerequisite: Consent of instructor. Seminar or lecture course on a selected topic, issue, or interest area in criminology or criminal justice. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CJ 4990 (5990) - Special Topics

Cr. 1-3.

Prerequisite: Consent of instructor. Seminar or lecture course on a selected topic, issue, or interest area in criminology or criminal justice. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

Curriculum

CUED 4120 (5120) - Materials and Methods for Teaching Speech and Theatre

Lec. 3. Cr. 3.

Prerequisite: Full admission to the Teacher Education Program. Corequisite: CUED 6800. Principles, objectives, techniques, evaluation in secondary school teaching of speech and elementary and secondary school teaching of theater. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CUED 4400 (5400) - Teaching Methods for Physical Sciences

Lec. 3 Cr. 3

This course focuses on teaching methods associated with the physical sciences of physics and chemistry. Students will experience and learn the theories behind inquiry, modeling, and other appropriate classroom instructional methods for physics and chemistry topics. Methods and topics will cover grades K-12 with a strong emphasis on conceptual understanding and vertically-aligned standards-based instruction.

CUED 4750 (5750) - Service Learning Informal STEM Education

Lec. 0-3. Cr. 0-3.

This course provides students with the opportunity to plan, prepare, and present informal activities/lessons in science, technology, engineering, and mathematics to PreK-12th graders. Students in the 5000 level course will complete additional work. May be repeated for credit.

CUED 4850 (5850) - Workshop in Education

Cr. 1-6.

Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

CUED 4900 (5900) - Study Abroad

Lec. 1-6. Cr. 1-6.

This course provides students the opportunity to engage in a faculty-led study abroad experience which may involve a service-learning component. All participants must comply with established policy, procedures, and guidelines outlined in the Faculty-led Program Abroad Handbook maintained by Tennessee Tech's Study Abroad Office. Students in the 5000 level course will complete additional work. May be repeated for credit.

CUED 5010 - Curriculum Improvement

Cr. 3.

A critical analysis of conventional and innovative approaches to curriculum improvement. The functions of leadership, evaluation, and research.

CUED 5800 - Practicum in Teaching

Cr. 1.

Supervised work experiences in public schools.

CUED 5850 - Workshop in Education: Service Learning

Cross-listing: CUED 4850

Lec. 2 Credit 2

Service Learning

CUED 5870 - Supervised Field Experiences in Teaching I

Cr. 5.

Prerequisite: Admission to the Supervised Field Experiences in Teaching Program. Corequisite: CUED 5890. A full day, full semester supervised field experience in an approved public school. The participant will be an employee of the school system and hold an Interim Probationary license or Probationary Permit for the grade/subject of the placement.

CUED 5880 - Supervised Field Experiences in Teaching II

Cr. 5.

Prerequisite: CUED 5870. Continuation of CUED 5870.

CUED 5890 - Graduate Seminar for Student Teaching

Cr. 2.

Corequisite: ECED/ELED/SEED/SPED 4870, 4880. Seminar on issues of student teaching with special emphasis on classroom management and professional development.

CUED 5900 - Study Abroad

Cross-listing: CUED 4900

Lec. 1-6 Credit 1-6

This course provides students the opportunity to engage in a Faculty-led study abroad experience which may involve a service-learning component. All participants must comply with established policy, procedures, and guidelines outlined in the Faculty-led Program Abroad Handbook maintained by Tennessee Tech's Study Abroad Office. Students in the 5000 level course will complete additional work. May be repeated for credit.

CUED 6010 - Curriculum Development and Evaluation

Lec. 3. Cr. 3.

Current trends in curriculum development; defining objectives; planning for improvement; organization of instructional materials; curriculum evaluation.

CUED 6050 - Readings in Curriculum

Cr. 3.

Readings and independent study involving exploration on a particular topic.

CUED 6100 - Instructional Strategies

Lec. 3. Cr. 3.

Advanced educational methods for K-12, including an emphasis on current research and best practice in the field.

CUED 6150 - Middle School Curriculum

Cr. 3.

An examination of the function, organization, curricular offerings, instructional strategies, and trends in middle schools.

CUED 6250 - School and Community Partnerships

Lec. 3. Cr. 3.

Techniques and procedures for interpreting school programs and building relationships between the school and community, and the improvement of the instructional program through community resources and involvement.

CUED 6300 - Quantitative Educational Research

Lec. 3. Credit 3.

Research design and quantitative methods of research in education.

CUED 6305 - Quantitative Problems in Curriculum

Lec. 3. Credit 3.

Prerequisite: CUED 6300. Research of significant problems and issues in education.

CUED 6310 - Qualitative Research in Education

Lec. 3. Credit 3.

A study of qualitative research applications and analysis of design and selected research techniques.

CUED 6315 - Qualitative Problems in Curriculum

Lec.3. Credit 3.

Prerequisite: CUED 6310. Research of significant problems and issues in education.

CUED 6430 - Design Studio: Production of Instructional Materials

Lec. 3. Cr. 3.

The course focus is on design, preparation, and production of instructional materials utilizing current trends and technologies in education.

CUED 6440 - Emerging Technologies in Education

Online. Cr. 3.

Prerequisite: Consent of advisor and advanced graduate standing. This course surveys current and potential classroom technologies that influence teaching and learning. Students will develop and facilitate effective uses of current and emerging digital tools to locate, analyze, evaluate, and use information resources to enrich research, learning and educational practices.

CUED 6450 - Immersive Technologies for Teaching and Learning

Online. Cr. 3.

In this course, students will increase their knowledge of teaching and learning using immersive technologies. These experiences will serve to advance student learning, creativity, and innovation. Students will promote and develop these objectives in both face-to-face and virtual environments.

CUED 6460 - Constructivist Strategies for Classroom Instruction

Online. Cr. 3.

Prerequisite: Consent of advisor and advanced graduate standing. This course examines constructivist learning strategies for P-16 education. Constructivist theory and classroom implications are analyzed and reviewed. A strong emphasis is placed on infusing technology for instructional and curricular application.

CUED 6750 (7750) - Service Learning Informal STEM Education

Lec. 0-3. Cr. 0-3.

This course provides students with the opportunity to plan, prepare, and present informal activities/lessons in science, technology, engineering, and mathematics to PreK-12th graders. Students in the 7000 level course will complete additional work. May be repeated for credit.

CUED 6780 - Job-Embedded Graduate Seminar

Lec. 2 Cr. 2

Develop an understanding of state standards and curriculum, identify effective instructional strategies, and implement appropriate assessment methods to support and meet the needs of all learners. State specific licensure requirements for JobEmbedded educators will be addressed.

CUED 6800 - Field Experience

Cr. 1-3.

Prerequisite: Full admission to the Teacher Education Program. Practical field experience in student's major area of emphasis.

CUED 6872 - Professional Seminar

Lec. 3. Cr. 3.

Seminar for licensure candidates to develop curriculum, identify effective instructional strategies, and implement appropriate assessment methods to support and meet the needs of all learners. A minimum grade of B is required to meet requirements for licensure candidates.

CUED 6875 - Job-Embedded edTPA

Lec. 2 Cr. 2

Supporting professional development in areas of planning, instruction, assessment, and reflection. A minimum grade of B is required to meet requirements for licensure candidates.

CUED 6880 - Student Teaching

Clinical. Cr. 9.

Prerequisite: CUED 6800 and Full admission to the Teacher Education Program. A semester-long performance based clinical experience in authentic settings involving planning appropriate instruction based on student's needs, creating a positive learning environment, communicating and collaborating with colleagues and others, effectively assessing student learning and reflecting on practice. THIS COURSE REQUIRES A GRADE OF 'B' OR BETTER.

CUED 6900 - Problems in Curriculum

Cr. 3.

Prerequisite: FOED 6920 or FOED 6980; consent of advisor. A study of persistent problems relating to curriculum with special attention to research findings.

CUED 6920 - Topics

Cr. 1-6.

Laboratory approach providing opportunities for experienced educational personnel to study in-depth educational problems.

CUED 6921 - Topics

Cr. 1-3.

This course will provide up-to-date content in emerging educational issues for in-service teachers. The specific topic will be designated in the title at each offering. The number of hours of credit will be based on the magnitude of the topic and the clock hours of face-to-face and/or online attendance. Course objectives and grading guidelines will be established by the faculty at the time each course is offered.

CUED 6922 - Topics

Cr. 1-3.

This course will provide up-to-date content in emerging educational issues for in-service teachers. The specific topic will be designated in the title at each offering. The number of hours of credit will be based on the magnitude of the topic and the clock hours of face-to-face and/or online attendance. Course objectives and grading guidelines will be established by the faculty at the time each course is offered.

CUED 6923 - Topics

Cr. 1-3.

This course will provide up-to-date content in emerging educational issues for in-service teachers. The specific topic will be designated in the title at each offering. The number of hours of credit will be based on the magnitude of the topic and the clock hours of face-to-face and/or online attendance. Course objectives and grading guidelines will be established by the faculty at the time each course is offered.

CUED 6924 - Topics

Cr. 1-3.

This course will provide up-to-date content in emerging educational issues for in-service teachers. The specific topic will be designated in the title at each offering. The number of hours of credit will be based on the magnitude of the

topic and the clock hours of face-to-face and/or online attendance. Course objectives and grading guidelines will be established by the faculty at the time each course is offered

CUED 6925 - Topics

Cr. 1-3.

This course will provide up-to-date content in emerging educational issues for in-service teachers. The specific topic will be designated in the title at each offering. The number of hours of credit will be based on the magnitude of the topic and the clock hours of face-to-face and/or online attendance. Course objectives and grading guidelines will be established by the faculty at the time each course is offered.

CUED 6926 - Topics

Cr. 1-3.

This course will provide up-to-date content in emerging educational issues for in-service teachers. The specific topic will be designated in the title at each offering. The number of hours of credit will be based on the magnitude of the topic and the clock hours of face-to-face and/or online attendance. Course objectives and grading guidelines will be established by the faculty at the time each course is offered.

CUED 6927 - Topics

Cr. 1-3.

This course will provide up-to-date content in emerging educational issues for in-service teachers. The specific topic will be designated in the title at each offering. The number of hours of credit will be based on the magnitude of the topic and the clock hours of face-to-face and/or online attendance. Course objectives and grading guidelines will be established by the faculty at the time each course is offered.

CUED 6928 - Topics

Cr. 1-3.

This course will provide up-to-date content in emerging educational issues for in-service teachers. The specific topic will be designated in the title at each offering. The number of hours of credit will be based on the magnitude of the topic and the clock hours of face-to-face and/or online attendance. Course objectives and grading guidelines will be established by the faculty at the time each course is offered.

CUED 6929 - Topics

Cr. 1-3.

This course will provide up-to-date content in emerging educational issues for in-service teachers. The specific topic will be designated in the title at each offering. The number of hours of credit will be based on the magnitude of the topic and the clock hours of face-to-face and/or online attendance. Course objectives and grading guidelines will be established by the faculty at the time each course is offered.

CUED 6990 - Research and Thesis

Cr. 3,6.

CUED 7010 - Learning Theories

Lec. 3. Cr. 3.

An advanced study of major learning theories with emphasis on making connections to recent instructional trends, teaching innovations and student learning.

CUED 7030 - Rural Schools and Communities

Lec. 3. Cr. 3.

Prerequisite: Graduate Standing. An in depth study of the historical, cultural, and economic characteristics of rural places and the role of schools and agencies in shaping the destiny of those places and their citizens.

CUED 7100 - Improvement in Teaching

Lec. 3. Cr. 3.

Advanced study of innovations, recent trends, research findings, and evaluation relating to the improvement of teaching.

CUED 7150 - Topics

Lec. 1-6

This course will provide up-to-date content in emerging educational issues. The specific topic will be designated in the title at each offering. The number of hours of credit will be based on the magnitude of the topic and the clock hours of face-to-face and/or online attendance. Course objectives and grading guidelines will be established by the faculty at the time each course is offered.

CUED 7430 - Specialized Applications of Technology to Education

Lec. 3. Cr. 3.

Prerequisite: CUED 6430. Application of current media technologies to maximize student learning with instructional design strategies appropriate for each technology.

CUED 7440 - Assistive Technology for Young Children and Families

Lec. 2. Cr. 2.

Prerequisite: CUED 7430. Application of assistive and adaptive technology and related equipment and procedures to support at-risk young children and families.

CUED 7510 - Instructional Design Foundations

Lec. 3. Cr. 3.

This course will focus on the tenets of Instructional System Design (IDS), and how it can be used to enhance and enrich the delivery of content in the P-12 classroom. Students will discover how ISD can strengthen instruction by making the acquisition of knowledge more efficient and appealing.

CUED 7520 - Teaching and Learning Online

Lec. 3. Cr. 3.

Prerequisite: Consent of advisor and advanced graduate standing. This course examines the design, delivery, and assessment of successful online pedagogies including virtual classroom, synchronous vs. asynchronous learning, web-based instruction, and virtual communities. Current research on best practice in online teaching and learning theory will be woven throughout.

CUED 7530 - Designing Integrated Technology Environments

Lec. 3. Cr. 3.

Prerequisite: Consent of advisor and advanced graduate standing. This course will focus on adapting and developing virtual and physical spaces into technology-rich learning environments. Students will evaluate the impact of educational technology by applying theoretical and conceptual models to real-world classrooms and learning environments. Current national standards, state reforms, and technological innovations will be embedded throughout.

CUED 7540 - Applied Instructional Design and Learning Analytics

Lec. 3. Credit 3.

This course will connect educational theories and pedagogical approaches to create more engaging learning/training modules. Interactive learning platforms used in various educational environments will be explored. Students will learn and apply analytics to improve and reflect on instructional design practices.

CUED 7800 - Laboratory and Field Experiences in Education

Cr. 3.

Prerequisite: Reading Specialists Concentration only. Consent of advisor and advanced graduate standing. Supervised practicums, observation, simulation, internships, and externships in education.

CUED 7801 - Lab and Field Experiences in Education/Technology Focus

Cr. 3.

Prerequisite: Consent of advisor and advanced graduate standing. Students will participate in a variety of field experience activities related to educational technology integration. Topics include classroom technology integration, emerging technologies, technology professional development, and technology leadership learning opportunities.

CUED 7802 - Lab and Field Experiences in Education/Grant Writing Focus

Cr. 3.

Prerequisite: Consent of advisor and advanced graduate standing. Students will participate in a field experience in education: Reading text to be informed of grant writing protocols, exploring and identifying funding sources for grant proposals, learn academic language used in grant writing, interview grant awardees, evaluate grant proposals, and submit a grant proposal for education.

CUED 7803 - Lab and Field Experiences in Education/Autoethnography Focus

Cr. 3.

Prerequisite: Consent of advisor and advanced graduate standing. Students will participate in a supervised field experience and observation in education; consider connections between culture, self, and others; learn the individualistic characteristics of autoethnography; and collect, manage, analyze, and interpret data in order to produce a sound qualitative study.

CUED 7900 - Reading and Research in Education

Cr. 3.

Prerequisite: Advanced graduate standing and consent of advisor. Study on an individual basis in the area of education being emphasized.

CUED 7910 - Advanced Research Project in Education

Cr. 3.

Prerequisite: Consent of advisor and advanced graduate standing. All students who complete requirements for the Ed.S. degree must complete an independent study project.

Decision Sciences

DS 4125 (5125) - Computer Forensics and Investigations

Lec. 3 Cr. 3

Prerequisite: Consent of instructor. Investigation, discovery, and analysis of digital computer evidence. Student work groups use computer hardware and forensic software to perform computer forensic investigations and solve sample cases. Students are introduced to and work with numerous computer forensic tools. Enrollment in junior- or senior-level DS courses requires junior standing. All business majors must have completed the Basic Business Program. Enrollment in DS 4125 course requires junior standing. Students may not receive credit for both DS 4125 and DS 5125.

DS 4900 (5900) - Special Topics in Decision Sciences

Lec. 1-3. Cr. 1-3.

Prerequisite: Consent of instructor. Current Topics in Decision Sciences. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

DS 6220 - Management of Information Technology

Lec. 3. Cr. 3.

Concepts of current components of information technology and their management as it relates to the support of the strategic business plan.

DS 6530 - Advanced Data Analytics

Lec. 3. Cr. 3.

An introduction to expert systems, decision support systems, and executive information systems as they are employed in business organizations.

DS 6540 - Network Security

Lec. 3. Cr. 3.

Introduces students to the concepts of telecommunications, wide and local area networks, and other state-of-the-art communications technologies.

DS 6550 - Database Management

Lec. 3. Cr. 3.

Introduces students to the concepts, terminology, tools, and techniques comprising the general area of data resources management.

DS 6570 - Cyber Security Management

Cr. 3.

The objective of this course is to provide students with a solid foundation and best practices for policy, governance, risk management and compliance with respect to an organization's information technology and resources.

DS 6900 - Special Topics

Lec. 3. Cr. 3.

A case course dealing with current topics in business.

ENTR 4500 (5500) - Innovation and Entrepreneurship: Lean Launchpad

Lec. 3 Cr. 3

Prerequisite: Students must have Junior or Senior standing or approval of the instructor. Lean Launchpad focuses on innovating and evolving a product or service into a viable business model. The curriculum is structured around the Lean Launchpad program where student teams organize and develop their "business canvas." Enrollment in ENTR 4500 course requires junior standing. Students may not receive credit for both ENTR 4500 and ENTR 5500.

Early Childhood Education

ECED 4210 (5210) - Early Childhood Education, Curriculum and Methods

Lec. 2. Cr. 2.

Prerequisite: Full admission to the second level. Corequisite: ECED 4220 (5220). Objectives, curriculum, materials, principles of teaching, and physical facilities for young children. students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ECED 4220 (5220) - Early Childhood Education, Practicum II

Lab. 10. Cr. 3.

Prerequisite: Full admission to the second level and ECED 2850 or consent of instructor. Corequisite: ECED 4210 (5210) or consent of instructor. Participation with children in kindergarten setting. Use of teacher-made materials, units, and innovative methods. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ECED 4230 (5230) - Early Intervention I

Lec. 3. Cr. 3.

Prerequisite: ECSP 2400. Methods of service delivery for infants and toddlers with developmental delays and their families. Effective consultation, trans-disciplinary collaboration, service coordination, family centeredness, and culturally responsive practices. A minimum grade of B is required to meet degree requirements for licensure and practitioner candidates.

ECED 4240 (5240) - Early Intervention II

Lec. 3. Cr. 3.

Prerequisite: ECED 4230(5230) Corequisite: ECED 4221 Best practices in early intervention for a variety of special needs. Methods and curriculum development to enable effective reciprocal relationships with families. A minimum grade of B is required to meet degree requirements for licensure and practitioner candidates.

ECED 4250 (5250) - Language Arts and Communicative Skills

Lec. 2. Cr. 2.

Prerequisite: Full admission to the second level. Relationship of language development and thinking to teaching communication skills to children. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ECED 4290 (5290) - Community Connections

Lec. 3. Cr. 3.

Prerequisite: CFS 2400. Survey of community resources for families and young children, with an emphasis on federal, state, and local programs.

ECED 4300 (5300) - Assessment of Young Children

Cross-listing: ECSP 4300 (5300)

Lec. 3. Cr. 3.

Prerequisite: Full admission to the Teacher Education Program; CFS 2400 or consent of instructor. Theories, principles, and practices associated with child find, assessment, and evaluation of young children, their families, and their environments. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ECED 4840 (5840) - Seminar: Language Acquisition from Birth to Five Years

Lec. 1. Cr. 1.

Corequisite: ECED 4250 (5250) or permission of instructor. Study of early language development, problems, and acquisition in children from birth to five years of age. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ECED 6200 - The Young Child

Lec. 3. Cr. 3.

Patterns of growth and development as related to the school curricula.

ECED 6230 - Early Intervention

Lec. 3 Cr. 3

Assessment specific to young children, their environments, and their families. Participants will gain knowledge and skills in interpreting assessment information for educational intervention.

ECED 6300 - Math, Science, Social Studies, and Technology for the Young Child

Lec. 3. Cr. 3.

Examination of methods and techniques for teaching math, science, social studies, and technology to children Pre K-3. Explores the integration of curriculum with special emphasis on inquiry methods for enhancing diverse learners' critical thinking abilities and includes practicum experience.

ECED 6400 - Multicultural Education: Perspectives and Instruction

Lec. 3. Cr. 3.

Multicultural knowledge base, cultural themes, and appropriate learning activities for children in a diverse society.

ECED 6810 - Practicum in Early Childhood Education

Cr. 3.

Practical guided experiences using innovative techniques or materials with children.

ECED 6900 - Problems in Early Childhood Education

Cr. 3.

A critical study of problems of early childhood education with special attention to research findings.

ECED 6920 - Topics

Cr. 1-6

Laboratory approach providing opportunities for experienced educational personnel to study in-depth early childhood education problems.

ECED 6990 - Research and Thesis

Cr. 3, 6.

ECED 7210 - Early Childhood Curriculum

Lec. 3. Cr. 3.

Major trends, programs, research, and innovations in Early Childhood Education with emphasis on curriculum development.

ECED 7220 - Early Childhood Instruction and Materials

Lec. 3. Cr. 3.

Planning objectives, activities, and materials for children, teaching techniques, and evaluation of curricula.

ECED 7250 - Assessment and Management

Lec. 3. Cr. 3.

Types, purposes and appropriateness of various assessment procedures and management styles for children, early education environments and curricula.

ECED 7350 - Advanced Child, Family, and School Relations

Lec. 3. Cr. 3.

Prerequisite: ECED 6200 or consent of instructor. Study and research in social, emotional, cognitive, language, motor and perceptual development and learning with children from birth through age eight (8) in the family and school contexts.

ECED 7800 - Laboratory and Field Experiences in Education

Cr. 3-4.

Prerequisite: Advanced graduate standing and consent of instructor. Supervised practicums, observation and internships in education.

ECED 7900 - Readings and Research in Early Childhood Education

Cr. 1-3.

Study on an individual basis of current literature and research in the area of education being emphasized.

ECED 7910 - Independent Study in Education

Cr. 3.

Prerequisite: Advanced graduate standing and consent of instructor. All students who complete requirements for the Ed.S. degree must complete an independent study project.

Early Childhood Special Education

ECSP 4300 (5300) - Assessment of Young Children

Cross-listing: ECED 4300 (5300)

Lec. 3. Cr. 3.

Prerequisite: Full admission to the Teacher Education Program; ECSP 2400. Theories, principles, and practices associated with child find, assessment, and evaluation of young children, their families, and their environment. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ECSP 6100 - Foundations of Early Childhood Education

Lec. 3. Cr. 3.

Examination of major concepts guiding practice in the field of early childhood education. Discussion of various historical and contemporary models and delivery systems for grades Pre K-4 in diverse and inclusive settings and includes practicum experiences. A minimum grade of B is required to meet licensure requirements for licensure candidates.

ECSP 6250 - Social/Emotional Teaching Strategies

Lec. 3 Cr. 3

Teaches skills to build rapport with children and families; create supportive learning environments; apply positive social-emotional teaching strategies; define specific discipline and guidance strategies; assess challenging behaviors; describe specific interventions related to challenging behaviors; and develop individualized, behavior guidance plans.

Economics

ECON 4120(5120) - Natural Resource Economics

Lec. 3 Cr. 3

Prerequisite: AGBE2100 or ECON2010 or consent of instructor This course examines economic aspects of natural resource use issues. The course will examine static and dynamic models of renewable and non-renewable resource allocation. Application of principles of economics will identify the causes, consequences, and ways of dealing with natural resource problems, including problems associated with fisheries, forests, water problems, and land. Conceptual topics and policy applications are presented with emphasis is on developing students' skills in applying "economic way of thinking" about natural resource management.

Econ 4200 (5200) - Environmental Economics

Lec. 3 Cr. 3

Prerequisite: AGBE2100 or ECON2010. A detailed study of the economic foundations of Environmental Policy and common tools used by environmental economists to measure and analyze benefits and costs of environmental regulation and consider the characteristics of efficient regulation.

ECON 4310 (5310) - Labor Economics

Lec. 3. Cr. 3.

Prerequisite: ECON 2020. Labor problems including economics of the labor market, wages, demand and supply of labor, unemployment. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ECON 4510 (5510) - International Trade and Finance

Lec. 3. Cr. 3.

Prerequisite: ECON 2020. International trade, monetary exchange, balance of payments, and foreign investments. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ECON 4520 (5520) - Comparative Economic Systems

Lec. 3. Cr. 3.

Prerequisite: ECON 2020. Analysis of essential economic features of the economic systems. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ECON 4530 (5530) - History of Economic Thought

Lec. 3. Cr. 3.

Prerequisite: ECON 2020. Development of economic doctrines and schools and economic thought from the mercantilist period to the present.

ECON 4600 (5600) - Economic Growth & Development

Lec. 3. Cr. 3.

Prerequisite: ECON 2020. A critical survey of growth and strategies of economic development, including regional growth and development; historical evidence of development. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ECON 4640 (5640) - Econometrics

Lec. 3. Cr. 3.

Prerequisite: ECON 3630, 3810, 3820, or consent of instructor. An advanced treatment of statistical models applied to economics, including the general linear model, heteroscedasticity, autocorrelation, multi-collinearity, simultaneous equations, and other violations of OLS assumptions. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ECON 4900 (5900) - Contemporary Economics Workshop

Cr. 1-6.

Thorough and intensive training of public school teachers in fundamental economic principles and current issues. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ECON 5030 - Fundamentals of Economics

Lec. 3. Cr. 3.

Production and distribution of wealth and income; basic principles of the American capitalistic economy.

ECON 5990 - Special Topics in Economics

Lec. 3. Credit 3.

Directed study and research on a selected topic in economics. Available to graduate students on an individual basis with consent of instructor. Course may be taken more than once as topics change.

ECON 6000 - Managerial Economics

Lec. 3 Cr. 3.

The study of fundamental principles of microeconomics most relevant to managers. Topics include managerial analysis, market equilibrium, pricing, market structures, incentive structures, and strategic interactions.

ECON 6050 - Analytical Decision Making

Lec. 3. Cr. 3.

Analytical decision making for business operations, including statistics, quantitative methods, and other optimization and simulation models.

ECON 6900 - Special Topics

Lec. 3. Cr. 3.

A case course dealing with current topics in business.

ECON 6920 - International Economics

Lec. 3. Cr. 3.

A case study course emphasizing the global environment in which today's businesses function.

Educational Leadership and Policy Analysis

ELPA 6560 - Small Group Leadership

Cr. 3.

Through activities in this course, students will explore their leadership skills specifically related to forming compatible achieving groups capable of completing tasks to complement the organizational vision. Students will examine the classic and contemporary literature on topics effecting groups such as conflict, collaboration, negation, power issues, decision making, compromise strategies, and team building.

Educational Psychology

PSY 6900 - Special Topics

Lec. 3. Cr. 3.

Concentration on a special topic in educational psychology and/or student personnel services. Course may be repeated if topic is different.

Electrical and Computer Engineering

ECE 4010(5010) - Analog Electronic Circuits

Lec. 3 Cr. 3

Prerequisite: Prerequisite: C or better in either ECE 3050 or ECE 3300 and C or better in either ECE 3010 or ECE 3330. Frequency response, multi-stage amplifiers, feedback, power output stages, circuit design.

ECE 4020 (5020) - Digital Signal Processing

Lec. 3. Cr. 3.

Prerequisite: C or better in ECE 2110 or ECE 2140, C or better in ECE 3020 or ECE 3330 and C or better in ECE 3130. Theory and practice of discrete-time signals and systems, A/D and D/A conversion, filter design, DSP architecture and implementation, programming, and DSP applications.

ECE 4120 (5120) - Fundamentals of Computer Design

Lec. 3. Cr. 3.

Prerequisite: C or better in ECE 3130, and C or better in either ECE3140 or ECE 4110. Continuation of digital system design concepts and applications with emphasis on computer hardware design: CPU sequencers, arithmetic/logic units, fixed and floating point arithmetic implementations, and computer peripheral interfacing, utilizing programmable logic. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ECE 4130 (5130) - Introduction to Digital VLSI

Lec. 3. Cr. 3.

Prerequisite: C or better in either ECE 2110 or ECE 2140; and C or better in either ECE 3050 or ECE 3300 Analysis, design, and layout of complex digital integrated circuits in MOS technology. The course emphasizes design through projects and requires extensive use of simulation and layout VLSI CAD tools.

ECE 4140(5140) - Embedded System Design

Lec. 2. Lab 3. Credit 3.

Prerequisite: C or better in either ECE 2110 or ECE 2140, C or better in ECE 3130. Basic hardware and software concepts in the analysis and design of embedded systems, peripheral interfaces and performance analysis with hands-on design project.

ECE 4150 (5150) - Cyber-Physical Systems Hardware Security

Lec. 3. Credit 3.

Prerequisite: C or better in CSC 1310; and C or better in ECE 3150. Topics in Cyber-Physical System (CPS) hardware security, including Internet of Things (IoT), Smart Grid, Vehicular ad-hoc Network (VANet), Autonomous Vehicles, Artificial Intelligence of Things (AIoT).

ECE 4210 (5210) - Control System Design

Lec. 3. Cr. 3.

Prerequisite: Grade of C or better in ECE 3210 and grade of C or better in ECE 3260. Design of compensators using frequency domain techniques; design projects with hardware implementation. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ECE 4370 (5370) - Mechatronics and Intelligent Machines Engineering

Cross-listing: ME 4370 (5370)

Lec. 2. Lab. 2. Cr. 3.

Prerequisite: C or better in ECE 3130. Mechatronics; number systems; microcontroller technology and architecture of 8-bit microcontrollers (e.g. Motorola MC68HC110); assembly language programming; A/D and D/A conversion; parallel I/O; programmable timer operation; interfacing sensors and actuators; applications; team project on design and implementation of a mechatronic system. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ECE 4510 (5510) - Electromagnetic Fields II

Lec. 3. Cr. 3.

Prerequisite: ECE 3510. Polarization, Poynting's vector, transmission lines, waveguides, radiation. Students enrolled in the 5000-level course will be required to complete additional work as required in the syllabus.

ECE 4520 (5520) - Optoelectronic Engineering

Lec. 3. Cr. 3.

Prerequisite: ECE 3540. Device theory for optical communication and instrumentation systems. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ECE 4610 (5610) - Power Systems Analysis

Lec. 3. Cr. 3.

Prerequisite: ECE 3610. Power system components modeling in steady state, per unit calculations, transmission line steady state operation, power flow analysis, economic dispatch, and applications of commercial software. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ECE 4620 (5620) - Power System Operation and Control

Lec. 3. Cr. 3.

Prerequisite: ECE 4610 (5610). Symmetrical components, fault analysis, system protection, transient stability, power system controls including: automatic generation control, voltage regulation, and economic dispatch. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ECE 4630 (5630) - Power Electronics

Lec. 3. Cr. 3.

Prerequisite: C or better in either ECE 3050 or ECE 3300; and C or better in ECE 3610 Uncontrolled and controlled rectifiers, voltage controllers, chopper, dc motor control, pulse-width modulation inverters, induction motor control, power supplies. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ECE 4710 (5710) - Principles of Telecommunications

Lec. 3. Cr. 3.

Prerequisite: ECE 3710 and either ECE 3910 or MATH 3470. Performance of analog and digital communication

systems in the presence of noise. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ECE 4720 (5720) - Telecommunication Systems Design

Lec. 3. Cr. 3.

Prerequisite: C or better in ECE 3710 and C or better in MATH 3470 Link budget, synchronization, frequency synthesis, receiver architecture, noise and distortion, error correction codes, and spread spectrum systems.

ECE 4830 (5830) - Applications of Machine Learning in Electrical and Computer Engineering

Lec. 3. Credit 3.

Prerequisite: Prerequisite: C or better in either CSC 1300 or ENGR 1120; C or better in MATH 2010; and C or better in MATH 3470. Fundamentals of machine learning with emphasis on practical applications to electrical and computer engineering problems. Supervised learning (linear and logistic regression, decision trees, and neural networks), unsupervised learning.

ECE 4990 (5990) - Special Problems

Cr. 1-4.

Prerequisite: Consent of instructor. Current topics in electrical engineering in the form of a reading course or an experimental lecture course. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ECE 6040 - Signal Analysis

Lec. 3. Cr. 3.

Prerequisite: Graduate standing. Analysis of continuous and discrete signals; orthogonal expansion of signals; sampling and reconstruction; theory and application of Fourier and z-transforms, FFT algorithms and spectral analysis.

ECE 6110 - Microprocessor Systems

Lec. 3. Cr. 3.

Prerequisite: ECE 3120 and ECE 4110 (5110), or equivalent. Design of microprocessor-based controllers from sensor to output, including hardware and software for control, data acquisition, computation, and I/O.

ECE 6130 - Computer Architecture

Lec. 3. Cr. 3.

Prerequisite: ECE 4120 (5120) or equivalent. Analysis and design of computing systems. Performance issues, cache and virtual memory structures, and pipelined CPUs.

ECE 6150 - Digital VLSI Design

Lec. 3. Cr. 3.

Prerequisite: ECE 4130 (5130) or equivalent. Hierarchical design of NMOS and MOS ASICs, MOS technology and fabrication. Standard cell and full-custom chip layout. FPGAs, FSMs, and iterative networks. Use of CAD tools.

ECE 6170 - High Performance Embedded Systems Design

Lec. 3. Cr. 3.

Prerequisite: ECE 4140. Hardware and software concepts in the design and analysis of embedded systems. Memory types and peripheral interfaces used in embedded systems. Performance analysis of embedded systems designs.

ECE 6200 - Linear Systems Analysis

Lec. 3. Cr. 3.

Prerequisite: ECE 3210 or ME 4810 (5810). State space analysis of multiple-input/multiple-output continuous and discrete-time systems; linear spaces; timevarying systems, controllability, observability, and stability.

ECE 6230 - Linear Multivariable System Design

Lec. 3. Cr. 3.

Prerequisite: ECE 6200, ECE 6250. Optimal control; robust stability; loop shaping design using singular values; loop transfer recovery; survey of other multivariable system designs.

ECE 6250 - Random Signals and Systems

Lec. 3. Cr. 3.

Prerequisite: ECE 3910 or equivalent. Probability models used in engineering; transformations of random variables; stochastic processes for engineering applications; linear least-square estimation; spectral analysis; Markov systems.

ECE 6280 - Nonlinear Automatic Control

Lec. 3. Cr. 3.

Prerequisite: ECE 6200. Singular points; limit cycles; perturbation techniques; describing functions; stability.

ECE 6510 - Electromagnetic Field Theory I

Lec. 3. Cr. 3.

Prerequisite: Graduate standing in EE. Boundary value problems in electrostatics and magnetostatics; electric and magnetic multipole interactions; Maxwell's stress tensor; Maxwell's equations; EM wave propagation in vacuum and dielectric media.

ECE 6530 - Quantum Engineering Theory I

Lec. 3. Cr. 3.

Prerequisite: Graduate standing in EE. Introduction to quantum principles, Schrodinger theory, Dirac theory, time-independent perturbation theory, variation method of approximation.

ECE 6580 - Instrumentation and Transducer Technology

Lec. 3. Cr. 3.

Prerequisite: ECE 4230 (5230) or equivalent. A study of applications of instrumentation systems, transducer and sensor devices, signal conditioning and recording considerations with emphasis on parameters as temperature, velocity, acceleration, pressure, and others. Calibration techniques, error consideration, and new and current instrument developments will be presented.

ECE 6600 - Computer Methods of Power System Analysis

Lec. 3. Cr. 3.

Prerequisite: ECE 4620 (5620). Power system matrices; fault and contingency analyses, power flow and optimal dispatch methods, state estimation and stochastic methods, automatic generation control and transient stability analyses.

ECE 6620 - Advanced Electric Machinery

Lec. 3. Cr. 3.

Prerequisite: ECE 3610. Basic principles of energy conversion; reference frame theory; induction machines; synchronous machines; permanent magnet machines and stability analysis.

ECE 6640 - Renewable Energy & Distributed Generation

Lec. 3. Cr. 3.

Prerequisite: ECE 4610 (5610). Principles of renewable energy and distributed generation; operation of distributed energy resources (DER)—photovoltaics, wind, fuel cells, etc.; hybrid power generation technology; distributed generation control; economics of DER.

ECE 6650 - Design and Control of Power Electronics Systems

Lec. 3. Cr. 3.

Prerequisite: Consent of instructor. Phase controlled converter, voltage and current inverters; inverter design and analysis, electric motor control.

ECE 6670 - Power Flow Control in Modern Power Systems

Lec. 3. Cr. 3.

Prerequisite: ECE 4610 (5610) or equivalent. Flexible AC transmission system, static VAR compensator, unified power flow controller, and enhancement of dynamic stability.

ECE 6710 - Communication Systems Theory

Lec. 3. Cr. 3.

Prerequisite: ECE 4710 (5710) or consent of instructor. Introduction to systems, theories and inherent problems of modern digital communication systems.

ECE 6730 - Information Theory and Reliable Communication

Lec. 3. Cr. 3.

Prerequisite: ECE 6250, ECE 6710 A measure of information, theory of source and channel coding, rate distortion, and channel capacity.

ECE 6750 - Wireless Communication Systems

Lec. 3. Cr. 3.

Prerequisite: ECE 4710 (5710) or equivalent. Modern wireless systems, including cellular design, propagation modeling, multiple access, and signal process techniques.

ECE 6900 - Special Problems in Electrical Engineering

Cr. 1-4.

Prerequisite: Consent of instructor. Investigation of a topic pertaining to the area of electrical engineering which is compatible with the student's prerequisites, interest, and ability.

ECE 6910 - Introduction to Graduate Research

Lec. 1. Cr. 1.

Prerequisite: Graduate student standing. Research tools and written and oral presentations in electrical and computer engineering area; graduate thesis; ethics in research.

ECE 6970 - Non-Thesis Design Project

Lec. 3, Cr. 3.

Prerequisite: Consent of Instructor, enrolled in Non-thesis MS option. An independent design project that may be implemented either in software or/and hardware. A formal written project report and oral presentation will be given to the student's advisory committee.

ECE 6980 - Directed Study

Cr. 1-4.

ECE 6990 - Research and Thesis

Cr. 1,3,6,9.

ECE 7110 - Advanced Digital Design

Lec. 3. Cr. 3.

Prerequisite: Consent of instructor. Advanced design techniques for digital systems including computer aided design and VLSI.

ECE 7170 - Advanced Embedded Systems

Lec. 3. Cr. 3.

Prerequisite: ECE 6170. Advanced topics in the design of FPGA-based embedded systems including data stream management, embedded systems for multi-media, real-time embedded systems, and embedded system security.

ECE 7530 - Quantum Electronics I

Lec. 3. Cr. 3.

Prerequisite: ECE 6540. Review of quantum principles; interaction of radiation with atomic systems; laser theory.

ECE 7600 - Power System Control

Lec. 3. Cr. 3.

Prerequisite: ECE 6600 or equivalent. Machine voltage control; system voltage control; automatic generation control and inter-area power transfer; stability analysis; analysis and design of power system stabilizers and energy control centers.

ECE 7620 - Adjustable Speed Drives

Lec. 3. Cr. 3.

Prerequisite: ECE 6620, ECE 6650. Principles of adjustable speed motor drives; direct current motor drives; induction motor drives, field orientation control; adjustable speed synchronous motor drives.

ECE 7640 - Distributed Energy Systems

Lec. 3. Cr. 3.

Prerequisite: ECE 6640. Instantaneous power theory, active and passive filters, distributed energy resources, modeling and control, interfaces, protection and economics of distributed generation systems.

ECE 7650 - Design and Finite Element Analysis of Electric Machines

Lec. 3. Cr. 3.

Prerequisite: ECE 6620. Dynamic electromagnetic circuit analysis, calculation of inductances, methods for designing and optimization of electric machines, finite element analysis methods.

ECE 7750 - Advanced Wireless Systems

Lec. 3. Cr. 3.

Prerequisite: ECE 6750 or equivalent. Advanced modulations for fading channels, multiple-input multiple out (MIMO), space-time coding, ultrawideband communications, cognitive radio, and wireless sensor networking.

ECE 7970 - Selected Topics

Cr. 1-4.

ECE 7980 - Directed Study

Cr. 1-4.

ECE 7990 - Research and Dissertation

Cr. 1,3,6,9.

Elementary Education

ELED 6120 - Elementary School Programs

Lec. 3. Cr. 3.

The historical development of the elementary school curriculum; factors affecting curriculum planning; analysis of contemporary curricula.

ELED 6400 - Advanced Studies in Elementary Science Education

Cr. 3.

Explores and analyzes current issues and trends in methods, materials, and content in teaching elementary school science. Special emphasis will be on problem-solving skills.

ELED 6500 - Diagnostic and Remediation Techniques in Elementary Mathematics

Cr. 3.

Analyzes techniques used by regular classroom teachers in diagnosing and correcting learning difficulties associated with elementary school mathematics.

ELED 6600 - Organizing Themes for Social Studies

Cr. 3.

Explores the basic organizing themes and conceptual framework utilized in social studies instruction.

ELED 6900 - Problems in Elementary Education

Cr. 3.

A critical study of problems of the elementary school with special attention to research findings.

ELED 6920 - Topics

Cr. 1-6.

Laboratory approach providing opportunities for experienced educational personnel to study in-depth educational problems.

ELED 7400 - The Literacy Language Arts Program

Lec. 3. Cr. 3.

Current curricular issues concerning language arts education, including use of storytelling and writing activities to enhance reading and language skills.

Engineering

ENGR 5250 - Technical Communication for Engineers

Lec. 3 Cr. 3.

Prerequisite: None Introduction to technical communications in engineering professional and technical contexts. Emphasis on writing technical, professional, and academic documents, such as memos, emails, reports, scholarly articles, thesis/dissertation and poster presentation: giving oral presentations; working on teams; technical editing; and adapting technical information for different audiences.

ENGR 6200 - Statistical Inference for Engineers

Cross-listing: CEE 6200.

Lec. 3. Cr. 3.

Prerequisite: Introductory calculus based statistics course or consent of instructor. Decision making with hypothesis testing and confidence intervals. Multiple regression and stepwise regression. Design of one and multifactor experiments. 2k experiments with blocking and fractional factorials. Control charting of time series data.

ENGR 6970 - Selected Topics

Cr. 1-3.

Prerequisite: Approval by department chairperson. Selected topics of current interest in graduate-level engineering that are not covered in existing graduate courses.

ENGR 6980 - Directed Study

Cr. 1-3.

Prerequisite: Approval by department chairperson. Individual or small-group study of topics of current interest in graduate-level engineering.

Engineering Management

EMGT 6100 - Introduction to Engineering Management

Cr. 3.

Prerequisite: Admission to graduate degree program. Broad introduction to engineering management fundamentals as applied to scientific or technological organizations; including discipline definitions, management and leadership principles, basic organization structures, project management practices, and ethical decisions.

EMGT 6210 - Project Management 1

Cr. 3.

Prerequisite: EMGT 6100-Introduction to Engineering Management and undergraduate Calculus-Based Probability and Statistics course. Comprehensive understanding of the fundamentals of project management as applied to scientific or technological organizations; including project planning, organizing, staffing, scheduling, budgeting and controlling.

EMGT 6220 - Project Management 2

Cr. 3.

Prerequisite: Successful completion of EMGT 6210: Project Management 1. Building upon the EMGT 6210 Project Management 1 course, Project Management 2 examines the relationship between a project and its procurement and implementation, including RFPs, proposals, contracts, project charter, bridging documents, and issues of quality and integrity. Emphasis is also placed on external topics that impact project management including business development, relationship management, and negotiation.

EMGT 6230 - Project Management 3

Cr. 3.

Prerequisite: EMGT 6210-Project Management 1. Advanced understanding and application of system-wide tools for the management of large scale, technical projects.

EMGT 6300 - Decision Analysis

Cr. 3.

Prerequisite: ENGR 6200, CEE 6200 The course will focus on complex decisions that involve tradeoffs among objectives or are made in the face of uncertainty. Topics include the nature of decision-making; tools for framing and analyzing hard decisions; risk and uncertainty in decision-making; the value of information; and ethical decision-making.

EMGT 6900 - Professional Project

Cr. 3.

Prerequisite: Admission to the Engineering Management degree program and completion of at least 24 hours of

credit. The Professional Project is the capstone course for the Master of Science in Engineering Management degree, serving as the integrative culmination of the degree program.

English

ENGL 4111 (5111) - Chaucer

Spring (O). Lec. 3. Cr. 3.
Selected works of Geoffrey Chaucer

Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 4121 (5121) - Shakespeare

Cross-listing: THEA 4121 (5121)
Lec. 3. Cr. 3.

Historical, thematic, and other approaches in the study of Shakespeare. (May be repeated once as an elective, provided the course content is different.) Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 4130 (5130) - Milton

Lec. 3. Cr. 3.
Selected works of John Milton. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 4140 (5140) - Topics in British Literature to 1667

Lec. 3. Cr. 3.
Topics in Medieval and/or Early Modern British literature. Course may be repeated, provided the content is different each time. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 4210 (5210) - Eighteenth-Century British Literature

Lec. 3. Cr. 3.
Studies in eighteenth-century British literature. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 4221 (5221) - Romantic Literature

Lec. 3. Cr. 3.
Studies in Romantic literature. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 4231 (5231) - Victorian Literature

Lec. 3. Cr. 3.
Studies in Victorian literature. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 4240 (5240) - Topics in British Literature After 1667

Lec. 3. Cr. 3.

Studies in Modern British literature. Course may be repeated, provided the content is different each time. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 4250 (5250) - Post Modern Literatures in English

Lec. 3. Cr. 3.

Studies in post modern literary issues.

ENGL 4310 (5310) - Early American Literature

Lec. 3. Cr. 3.

Study of American literature from colonial period through early nationalist period. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 4320 (5320) - Nineteenth Century American Literature

Lec. 3. Cr. 3.

Study of the literature and literary movements of the period, with emphasis on romanticism and/or realism. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 4330 (5330) - Modern American Literature

Spring (O). Lec. 3. Cr. 3.

Study of the literature and literary movements of the period, with emphasis on the twentieth century and/or contemporary period. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 4340 (5340) - Topics in American Literature

Lec. 3. Cr. 3.

Thematic, interdisciplinary, or genre-based approaches to American literary study beyond the usual scope of ENGL 4310 (5310), ENGL 4130 (5130), or ENGL 4330 (5330). Course may be repeated, provided the content is different each time. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 4411 (5411) - Writing in the Professions

Lec. 3. Cr. 3.

This course builds on students' present writing competency and focuses on writing in their particular majors and/or professions. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 4421 (5421) - Forms of Argumentation and Persuasion: Theory and Practice

Lec. 3. Cr. 3.

Introduces students to various models of argumentation through theory (readings) and practice (analysis and production). Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 4430 (5430) - Creative Writing: Fiction

Lec. 3. Cr. 3.

Prerequisite: Prior consent of instructor (for graduate students not in the Creative Writing concentration.). Guided practice in the craft and art of writing short fiction. Course may be repeated, provided the content is different each time. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 4440 (5440) - Creative Writing: Essay

Lec. 3. Cr. 3.

Prerequisite: Prior consent of instructor (for graduate students not in the Creative Writing concentration). Guided practice in the craft and art of writing personal essays. Course may be repeated, provided the content is different each time. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 4450 (5450) - Creative Writing: Poetry

Lec. 3. Cr. 3.

Prerequisite: Prior consent of instructor (for graduate students not in the Creative Writing concentration). Guided practice in the craft and art of writing poems. Course may be repeated, provided the content is different each time. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 4451 (5451) - Introduction to Rhetoric: Theory and Practice

Lec. 3. Cr. 3.

The course introduces students to rhetoric—history and special topics. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 4460 (5460) - Lit/Mag Editing/Iris Review

Lec. 3. Credit 3.

Prerequisite: Enrollment in the English MA Creation of a literary magazine annual edition from initial call for submissions through publication. Course may not be repeated at the graduate level.

ENGL 4470(5470) - Topics in Advanced Creative Writing

Lec. 3 Cr. 3.

Prerequisite: ENGL 4430 or ENGL 4440 or ENGL 4450 or prior consent of the instructor Thematic, genre-based, or research-inflected creative writing workshop, at a level of advanced practice. Course may be repeated provided the content is different each time. Possible topics include Creative Research, Witness Writing, Social Issues, Identity, and Multimedia.

ENGL 4511 (5511) - Introduction to Descriptive Linguistics

Cross-listing: LING 4511 (5511)

Lec. 3. Cr. 3.

Introduction to descriptive analysis of language: phonology, morphology, lexicon, and syntax. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 4521 (5521) - History of the English Language

Cross-listing: LING 4521 (5521)

Lec. 3 Cr. 3.

History of the language from its origins to the present, emphasis upon historical development of English sounds, word

structure, and syntax. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 4531 (5531) - Grammar and Language

Cross-listing: LING 4531 (5531)

Lec. 3. Cr. 3.

Grammatical structure of English in relation to dialect and register with some emphasis on historical and potential changes in grammar. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 4541 (5541) - Topics in Linguistics/Language

Cross-listing: LING 4541 (5541)

Lec. 3. Cr. 3.

Examination of specific aspects of language and/or linguistic study, such as Old and Middle English, the language of dialect literature, or American English dialects. Course may be repeated, provided the content is different each time. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 4561 (5561) - American English

Lec. 3. Cr. 3.

This class will examine American English from multiple cultural and linguistic angles and allow the students to develop their own understanding of how the language around them shapes their lives. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 4610 (5610) - Novel

Fall (O). Lec. 3. Cr. 3.

Theory of the novel and a study of selected novels. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 4620 (5620) - Poetry: Form, Genre, Theory

Lec. 3. Cr. 3.

The study of poetry written in English and translated from other languages, with attention to such topics as poetic movements, styles, trends, the evolution and development of forms. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 4630 (5630) - Literary Criticism and Theory

Fall (E). Lec. 3. Cr. 3.

Historical and thematic studies of critical studies of critical and theoretical trends and issues. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 4640 (5640) - Modern and Contemporary Drama

Lec. 3. Cr. 3.

Study of dramatic texts and performance issues from the late 19th century to the present. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 4650 (5650) - The Graphic Novel

Lec. 3. Cr. 3.

Theory of comics-format texts and study of selected graphic novels. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 4712 (5712) - African American Literature

Lec. 3. Cr. 3.

Studies of African American literature and culture, both oral and printed. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 4713 (5713) - Native American Literature

Lec. 3. Cr. 3.

Studies of Native American literature and culture, both oral and printed. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 4720 (5720) - Continental Literature

Lec. 3. Cr. 3.

Study of major works and writers from the European continent. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 4731 (5731) - Approaches to Women and Literature

Lec. 3. Cr. 3.

Studies of major women writers or images of women in literature. Course may be repeated, provided course content is different each time. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 4741 (5741) - Science and Culture

Lec. 3. Cr. 3.

Cultural influences on scientific discourse and literature about science. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 4751 (5751) - Topics in Non-Western Literature

Lec. 3. Cr. 3.

Focuses on literature written outside of European literary traditions, either written or translated into English. Course may be repeated, provided the content is different each time. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 4810 (5810) - Introduction to Folklore

Lec. 3. Cr. 3.

Generic survey of folklore; possible definitions, varieties, meanings, and methods of study. Stress on verbal traditions (tales, songs, and beliefs). Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 4820 (5820) - Upper Cumberland Folklore

Lec. 3 Cr. 3

Folklore of the Upper Cumberland with emphasis on relationships between regional material and the broad perspective of the humanities. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 4830 (5830) - Southern Literature

Lec. 3. Cr. 3.

Major writers of the South, with emphasis on regional themes and on the Southern literary renaissance. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 4840 (5840) - The Gothic Tale of Terror

Lec. 3. Cr. 3.

Readings in Gothic poetry and prose. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 4911 (5911) - The Literature of Science

Lec. 3. Cr. 3.

Topics in literary non-fiction written by scientists. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 4921 (5921) - Literature and Technology

Lec. 3. Cr. 3.

Study of literature which deals with the impact of technology on society. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 4931 (5931) - Literature and the Environment

Lec 3. Cr. 3.

A study, through literature, of the relationship between humans and the environment. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 4950/5950 - Topics in Professional and Technical Communication

Cross-listing: PC 4950/5950

Lec: 3 CR: 3

Prerequisite: ENGL 3250 or PC 3250 In-depth study of topics relevant to the field of Professional and Technical Communication. Course may be repeated provided the content is different.

ENGL 4970 (5970) - Professional Communication II

Lec. 3. Cr. 3.

Continuation of PC 3250 with emphasis on more complex documents. (Same as PC 4970 (5970)). Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 4981 (5981) - Topics

Cr. 1.

Course work or directed individual research in any area where there is no other course offering. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 4982 (5982) - Topics

Cr. 2.

Course work or directed individual research in any area where there is no other course offering. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 4983 (5983) - Topics

Cr. 3.

Course work or directed individual research in any area where there is no other course offering. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 4990 (5990) - Internship

Cr. 3, 6, 9, 12.

Prerequisite: Prerequisite for 5990: graduate status, and consent of instructor. Part-time or full-time employment in a business or institutional setting related to a student's academic and career goals and cannot be taken in place of required or elective English courses, undergraduate or graduate. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 6000 - Introduction to Graduate Studies

Lec. 3. Cr. 3.

Bibliography, research methods, current theories, scholarly writing, professional issues and practices, and creation of professional portfolios.

ENGL 6010 - Teaching Composition

Spring. Lec. 3. Cr. 3.

Theories and pedagogies of teaching writing in the middle schools, secondary schools, and on the college level.

ENGL 6020 - Seminar in Early British Literature

Lec. 3. Cr. 3.

A study of selected topics and authors of the period.

ENGL 6080 - Seminar in British Literature 1500-1650

Lec. 3. Cr. 3.

A study of selected topics and authors of the period.

ENGL 6150 - Seminar in British Literature, 1650-1800

Lec. 3. Cr. 3.

A study of selected topics and authors of the period.

ENGL 6290 - Seminar in Nineteenth Century British Literature

Lec. 3. Cr. 3.

A study of selected topics and authors of the period.

ENGL 6350 - Sem. in 20th & 21st Century Brit Lit

Lec. 3. Cr. 3.

A study of selected topics and authors of the period.

ENGL 6400 - Special Topics

Lec. 3. Cr. 3.

Intensive course work or directed individual research of a selected author, movement, or genre.

ENGL 6520 - Seminar in Early American Literature

Fall (O). Lec. 3. Cr. 3.

A study of selected topics and authors of the period.

ENGL 6590 - Seminar in Nineteenth Century American Literature

Lec. 3. Cr. 3.

A study of selected topics and authors of the period.

ENGL 6640 - Sem. in 20th & 21st Century Am Lit

Lec. 3. Cr. 3.

A study of selected topics and authors of the period.

ENGL 6710 - Poetry Workshop

Lec. 3. Cr. 3.

Prerequisite: Prior consent of instructor (for graduate students not in the Creative Writing concentration). Exploration of a variety of poets, poetic practices, theories, and formal techniques, in the writing of poetry. Course may be repeated provided the content is different each time. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ENGL 6720 - Creative Prose Workshop

Lec. 3. Cr. 3.

Prerequisite: Prior consent of instructor (for graduate students not in the Creative Writing concentration). Guided practice in the craft and art of writing short fiction and/or personal essays, contextualized by the study of prose from a variety of sources, selected by the instructor. Course may be repeated provided the content is different each time.

ENGL 6890 - Directed Research

Cr. 3.

Faculty-directed independent research for the non-thesis option of the M.A.

ENGL 6990 - Research and Thesis

Cr. 3, 6.

English as a Second Language Pedagogy

ESLP 4100 (5100) - ESL Methodology and Materials for PreK-12

Lec. 3. Cr. 3.

Prerequisite: Full admission to the Teacher Education Program Current approaches, methodologies, techniques, and materials for teaching ESL primarily in preK-12 situations; developing literacy skills appropriate for age and language proficiency levels. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ESLP 4200 (5200) - ESL Assessment: Reading and Writing

Lec. 3. Cr. 3.

Prerequisite: Full admission to the Teacher Education Program; ESLP 4100 (5100). Assessing proficiency for ESL placement and eventual integration into school curriculum mainstreaming with special emphasis on language literacy skills: reading and writing. A minimum grade of B is required to meet requirements for licensure candidates. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ESLP 4300 (5300) - Field Experience in ESL

Cr. 3.

Prerequisite: Full admission to the Teacher Education Program; ESLP 4100 (5100) or consent of instructor. Teaching ESL in preK-12 under supervision of experienced ESL staff: writing objectives, planning lessons, materials evaluation, testing. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ESOL 6400 - Foundations of Language for ESOL Educators

Lec. 3. Credit 3.

Prerequisite: Full admission to the Teacher Education Program. Explores students' language acquisition and language development. Focuses on introduction of the language as a broad system in order to help future ESOL educators to successfully navigate through language acquisition theories and foundations of linguistics. A minimum grade of B is required to meet requirements for licensure candidates.

Environmental and Sustainable Studies

ESS 4300 (5300) - Environmental Management System

Cr. 3.

The course is a case study that presents the student with the techniques, technologies, regulations, and strategies that define industrial pollution prevention. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ESS 6510 - Programming GIS

Lec. 3. Cr. 3.

Python is a free and easy to learn language, tightly integrated into ArcGIS 10. This course introduces students to Python scripting to increase productivity and management of GIS data and adding more function to the projects.

ESS 6520 - Environmental Informatics Python Applications and Machine Learning

Lec. 3. Cr. 3.

Prerequisite: Prerequisite: ESS 6510, Programming GIS, or consent of the instructor. Data analysis pre-processing, visualization, classification, and statistical functions from Python packages and machine learning algorithms applied to environmental data. Students will gain professional experience working with real-world environmental data.

ESS 6910 - Internship

Cr. 3.

Prerequisite: At least 24 completed credit hours of PSM-EI courses approved by major professor and graduate advisory committee. The internship is the experiential component for the Professional Science Master's designation. It will include a capstone project supervised by faculty and employers, evaluated or graded by faculty, and typically developed with an employer, which integrates the practical application of scientific and professional knowledge, behavior and skills. The internship provides an opportunity for students to demonstrate proficiency in written and oral communications.

Environmental Sciences Agriculture

EVSA 6010 - Environmental Agriculture

Lec. 3. Cr. 3.

Provides a summary of the actual and/or relative environmental impacts of existing and emerging agricultural production technologies.

EVSA 7010 - Crop Environmental Interactions

Cr. 3

Understanding of how crops interact with the major environmental factors.

EVSA 7030 - One Health: Principles and Applications

Lec. 3. Cr. 3.

Prerequisite: BIOL 1020/ANS 1200, BIOL 3200, and consent of instructor. This course will focus on understanding and appreciation of the links among human, animal, and ecosystem health. Moreover, the importance of and commitment to working together to address health challenges will also be discussed. The need for collaboration in areas of education/teaching, research and community service both locally, nationally, and globally will be highlighted, thus providing the foundation for achieving One Health goals and objectives.

EVSA 7970 - Topics in Environmental Agriculture

Lec. 1-3. Lab. 0-3. Cr. 1-4.

Prerequisite: Full standing in the Environmental Sciences Ph.D. program or consent of instructor. Timely topics in environmental agriculture. Course may be taken for credit more than once for a maximum of eight (8) credit hours.

EVSA 7990 - Research and Dissertation

Cr. 1-9.

Environmental Sciences Biology

EVSB 6010 - Environmental Biology

Lec. 3. Cr. 3.

Biological concepts, community and ecosystem structure and function, population biology, water pollution, land and wildlife resources, endangered and threatened species, resource management, human impact, and environmental economics. This course cannot be taken for credit toward graduation by students with a degree or concentration in biology or wildlife and fisheries sciences.

EVSB 7050 - Environmental Risk Assessment

Lec. 2. Lab. 2. Cr. 3.

Prerequisite: BIOL 6060 and EVSC 6010. Assessment of ecological risk associated with new chemicals and effluents, existing chemicals and mixtures of chemicals, and human actions.

EVSB 7060 - Ecological Toxicology

Lec. 2. Lab. 2. Cr. 3.

Prerequisite: BIOL 6060 and EVSC 6010. A study of the mechanisms of toxicity in terrestrial and aquatic ecosystems, including the measurement of response, learning and teaching devices. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus. uptake, metabolism, and excretion of toxicants; design and interpretation of toxicity tests, hazard evaluation, risk assessment, and toxics reduction plans; fate and transport processes and advanced approaches in automated computer-assisted monitoring will be evaluated.

EVSB 7110 - Environmental Approaches to Fisheries Management

Lec. 3. Lab. 2. Cr. 4.

Prerequisite: WFS 4710 (5710) or BIOL 6630. An in-depth analysis of current fisheries management practices assessed from the ecosystem perspective.

EVSB 7120 - Endangered Species Biology

Lec. 3. Lab. 3. Cr. 4.

The biology, ecology, management, and recovery of threatened and endangered species.

EVSB 7130 - Wetlands Ecology

Lec. 3. Lab. 3. Cr. 4.

Ecology and legal issues concerning the management of wetland habitats and species.

EVSB 7140 - Wildlife and Fisheries Nutrition

Lec. 3. Cr. 3.

The nutritional and foraging ecology of wild fish, amphibians, reptiles, birds, and mammals.

EVSB 7150 - Population and Community Ecology

Lec. 3. Cr. 3.

Prerequisite: BIOL 3130 or WFS 3130. Empirical and theoretical concepts in ecology at the population and community levels, including population growth and regulation, species interactions, community assembly and dynamics, metapopulation ecology, and landscape ecology.

EVSB 7210 - New and Re-emerging Environmental Human Pathogens

Lec. 3. Cr. 3.

Prerequisite: 7 hours of microbiology courses or equivalent. Aspects of emerging human pathogens, including case histories of outbreaks, methods of detection in food and water, and techniques for enumeration and identification.

EVSB 7220 - Molecular Ecology and Evolution Seminar

Lec. 1. Cr. 1.

Prerequisite: BIOL 3130 and BIOL 4150 (5150). Review of current literature concerning application of modern molecular techniques to solve ecological and evolutionary questions. Course may be taken up to 3 times for credit.

EVSB 7230 - Molecular Ecology and Evolution

Lec. 3. Lab. 3. Cr. 4.

Role of molecular techniques in the study of ecology and evolution, including techniques used to study phylogeny, microorganism detection, population structure, gene flow, and kinship.

EVSB 7240 - Computers and Molecular Ecology

Lec. 2. Lab. 3. Cr. 3.

Prerequisite: EVSB 7230. The use and application of computer programs and Internet databases for studying molecular ecology and evolution.

EVSB 7310 - Plant Ecology

Lec. 3. Lab. 3. Cr. 4.

Interrelationships between plants and their environment and evaluation of community structure.

EVSB 7320 - Aquatic Botany

Lec. 3. Lab. 3. Cr. 4.

Anatomy, ecology, morphology, physiology, reproductive biology, evolution, and taxonomy/systematics of aquatic plants.

EVSB 7970 - Topics in Environmental Biology

Lab. 2-8. Cr. 1-4.

Prerequisite: Consent of instructor. Special study in an approved field under the supervision of a member of the graduate faculty. Course may be taken for credit more than once for a maximum of six (6) hours of credit.

EVSB 7990 - Research and Dissertation

Cr. 1-9.

Environmental Sciences Chemistry

EVSC 6010 - Environmental Chemistry

Lec. 3. Cr. 3.

Prerequisite: Graduate standing in environmental sciences; one (1) year of chemistry. This is a broad based course applying the fundamentals of chemistry to the environment. This course cannot be taken for credit toward graduation by students with a concentration in chemistry.

EVSC 7110 - Water, Soil, and Air Chemistry—Part I

Lec. 3. Cr. 3.

Prerequisite: CHEM 4520 (5520), CHEM 4710 (5710), or consent of instructor. Composition of waters and soils; kinetics and thermodynamics of environmental chemical and physical processes in waters and soils. Equilibrium modeling exercises are employed to prepare students for professional activities, and to reinforce course material.

EVSC 7120 - Water, Soil, and Air Chemistry—Part II

Lec. 3. Cr. 3.

Prerequisite: EVSC 7110 or consent of instructor. Electrochemistry and solubility of soil minerals. Kinetics, reaction dynamics, photochemistry, and heterogeneous phase chemistry of the troposphere and stratosphere. Students will become familiar with watershed modeling and the use of geographical information systems in environmental chemistry.

EVSC 7210 - Organic Chemistry in the Environment

Lec. 3. Cr. 3.

Prerequisite: CHEM 3520 and CHEM 6210 or consent of instructor. Introduction to specific organic compounds, their physical and chemical properties, chemical and photochemical transformation reactions and mechanisms in the environment, and literature case studies effectively used in their decontamination.

EVSC 7310 - Environmental Forensics

Lec. 3. Cr. 3.

Prerequisite: Consent of instructor Principles of environmental forensic science, including transport and fate of chemicals, changes in pollutants as they interact with the environment, linkages between pollutants and their sources, and legal considerations. Faculty lectures along with student presentations and discussion of primary literature will be the primary instructional approaches.

EVSC 7970 - Special Topics in Environmental Chemistry

Lec. 1-3. Lab. 0-3. Cr. 1-4.

Prerequisite: Full Standing in Ph.D. program in environmental sciences or consent of instructor. Timely topics in environmental chemistry. Course may be taken for credit more than once.

EVSC 7990 - Research and Dissertation

Cr. 1-9.

Environmental Sciences Geology

EVSG 6010 - Environmental Geology

Lec. 3. Cr. 3.

Prerequisite: Consent of instructor. Introduction to geology and the application of geologic knowledge to issues and potential solutions of problems arising from the interaction of human activities and natural earth processes.

EVSG 7970 - Topics in Environmental Geosciences

Lec. 1-3. Lab. 0-3. Cr. 1-4.

Prerequisite: Full standing in the Environmental Sciences Ph.D. program or consent of instructor. Timely topics in environmental geosciences. Course may be taken for credit more than once for a maximum of eight (8) credit hours.

EVSG 7990 - Research and Dissertation

Cr. 1-9.

Environmental Sciences

ESS 6970 - Special Topics

Lab. 2-8. Cr. 1-4

Prerequisite: Consent of instructor Special study in an approved field under the supervision of a member of the graduate faculty as approved by the director of the school. May be taken more than once for a maximum total of 6 credit hours.

EVS 7800 - Professional Development for Doctoral Students

Lec. 3. Cr. 3.

Prerequisite: Graduate classification and consent of instructor. Practical skills for professional development such as networking, resumés and interviews, career options, stress management, work productivity, ethical conduct, peer review, written and oral communication, leadership and group dynamics, and public outreach. Additional doctoral-level topics such as comprehensive exams, dissertation defenses, teaching/research philosophies, and faculty interviews will also be covered.

EVS 7810 - Instructional Methods for Adults

Lec. 3. Cr. 3.

Prerequisite: Graduate classification and consent of instructor. Theory and practice of adult education with an emphasis on subject areas of agriculture, natural resources and environmental sciences. The course will address teaching-learning methods in formal and non-formal instructional programs for adult learners.

EVS 7900 - Scientific Writing and Grantmanship

Lec. 3. Cr. 3.

Prerequisite: Full standing in Environmental Sciences Ph.D. program or consent of instructor. The overall goal of this course is to help students acquire writing skills and Grantmanship skills that will help them become competitive for research funds and be successful in publishing research papers.

EVS 7910 - Environmental Science Seminar

Lec. 1. Cr. 1.

Discussions and reports on the current literature and research in environmental science.

EVS 7970 - Topics in Environmental Integrated Research

Lec. 1-3. Lab. 0-3. Cr. 1-4.

Prerequisite: Full standing in the Environmental Sciences Ph.D. program or consent of instructor. Timely topics in environmental integrated research. Course may be taken for credit more than once for a maximum of eight (8) credit hours.

EVS 7990 - Research and Dissertation

Cr. 1-9.

Environmental Sciences Social

ESS 6000 - Environmental Law

Lec. 3. Cr. 3.

Prerequisite: Graduate standing and consent of instructor. An introductory graduate-level course on the development, purposes, and major tenets of environmental law, with particular focus on implementation and enforcement of the Clean Air Act; Clean Water Act; Comprehensive Environmental Response, Compensation, and Liability Act; Endangered Species Act; National Environmental Policy Act; and Resource Conservation and Recovery Act.

EVSS 6010 - Environmental Social Policy

Lec. 3. Cr. 3.

Prerequisite: Consent of instructor. Social, political, legal and scientific issues that influence environmental policy decisions.

Exceptional Learning

CFS 6610 - Families: Normative/Catastrophic Issued

Lec. 3. Cr. 3.

In-depth study of family stress and effective coping mechanisms that relate to normative transitions and crisis events.

EDU 7000 - Trans-Concentration Seminar

Cr. 1.*

Prerequisite: Admission to Ph.D. program. An introduction to the Ph.D. in Exceptional Learning familiarizing students with the procedures, requirements, and expectations of the program.

EDU 7010 - Theoretical Foundations of Research

Lec. 3. Cr. 3.

Prerequisite: Admission to Doctoral Program. The first of a three-course qualitative research sequence focusing on research theoretical and methodological foundations and qualitative research design.

EDU 7020 - At-Risk Populations: Research, Service, and Delivery

Lec. 3. Cr. 3.

Prerequisite: Admission to Doctoral Program. A survey of at-risk and diverse populations, their common and unique characteristics, and the research base for designing and implementing effective prevention and intervention strategies.

EDU 7040 - Program Planning and Proposal Development

Lec. 3. Cr. 3.

Prerequisite: Admission to Doctoral Program. Theoretical perspectives, models, and effective practices in the development, planning, and evaluation of programs and services in a variety of educational settings.

EDU 7050 - Advanced Learning and Cognition

Lec. 3. Cr. 3.

Prerequisite: Admission to Doctoral Program. Advanced theory, research, and applications in human learning, memory, and cognitive processes, holding at the center of the investigation specifics of diverse and at-risk populations.

EDU 7060 - Issues in Education

Lec. 3. Cr. 3.

Prerequisite: Admission to Doctoral Program. An examination and analysis of contemporary trends and issues in education, including leadership, legal, and ethical issues.

EDU 7300 - Research Design

Lec. 3. Cr. 3.

Prerequisite: EDU 7420 and Admission to Doctoral Program. Overview of planning, designing, and conducting experimental and non-experimental research in order to maximize research validity.

EDU 7310 - Research in Literacy

Lec. 3. Cr. 3.

Prerequisite: EDU 7300. Advanced literacy research, including a study replication with submission of findings for publication.

EDU 7320 - Research Methods in Behavior Analysis

Lec. 3. Cr. 3.

Prerequisite: EDU 7300 and Admission to Doctoral Program. An in-depth analysis of measurements, data, interpretation, and experimental design in behavior analysis focusing on single-case methodology.

EDU 7330 - Qualitative Inquiry in Research

Lec. 3. Cr. 3.

Prerequisite: EDU 7010 and Admission to Doctoral Program. The second qualitative research course focusing on implementation of a previously designed qualitative study, including data collection and reflexivity in research.

EDU 7340 - Data Analysis and Representation in Qualitative Inquiry

Lec. 3. Cr. 3.

Prerequisite: Admission to Doctoral Program and EDU 7330. The culminating qualitative research course focusing on theoretical and practical dimensions and applications of qualitative data analysis and representation.

EDU 7350 - Advanced Regression Analysis

Lec. 3. Cr. 3.

Prerequisite: Admission to Doctoral Program; EDU 7420 and EDU 7430. Advanced applications of regression analysis techniques.

EDU 7420 - Quantitative Inquiry in Education I

Lec. 3. Cr. 3.

Prerequisite: Admission to Doctoral Program and introductory course in statistics. In-depth training and understanding of common descriptive and inferential statistical techniques for conducting research and engaging in scholarly activities.

EDU 7430 - Quantitative Inquiry in Education II

Lec. 3. Cr. 3.

Prerequisite: Admission to Doctoral Program and EDU 7420. In-depth analysis that reinforces and expands common descriptive and inferential statistical techniques and includes advanced material appropriate for more complex research problems.

EDU 7440 - Technology Applications for Institutional Dissemination of Information

Lec. 3. Cr. 3.

Prerequisite: Admission to Doctoral Program. Analysis of creation, collection, and distribution of institutional information.

EDU 7920 - Research Seminar in Education

Lec. 3. Cr. 3.

Prerequisite: Admission to Doctoral Program; EDU 7010 , EDU 7300 , EDU 7330 , EDU 7340 , EDU 7420 , and EDU 7430 ; EDU 7310 or EDU 7320 In depth examination of experimental, quasiexperimental, and evaluation research as applied to dissertation research.

EDU 7950 - Doctoral Seminar: Special Topics in Education

Lec. 1-3. Cr. 1-6.

Prerequisite: Consent of the student's doctoral chairperson required.

EDU 7990 - Research and Dissertation

Cr. 1, 3, 6, 9.

Prerequisite: Admission to Doctoral Program; EDU 7920 .

EDUS 7500 - STEM Education Foundations

Lec. 3. Cr. 3.

Prerequisite: Admission to doctoral program. Introduction to the educational, political, economic, and socio-cultural foundations of the STEM and STEM education disciplines including the history and development of STEM education with attention to the STEM content in P-16 settings. Topics include: introduction to the nature of each of the STEM and STEM education disciplines; investigation of related political, economic, and socio-cultural foundations; and frameworks for constructing personal perspectives and philosophies of integrative STEM education.

EDUS 7510 - STEM Curriculum & Assessment

Lec. 3. Cr. 3.

Prerequisite: Admission to doctoral program. Current trends in STEM curriculum development and assessment. Topics include: defining objectives; planning for improvement; organization of instructional materials; and STEM curriculum evaluation.

EDUS 7515 - STEM Education Seminar

Lec. 1. Cr. 1.

Prerequisite: Admission to doctoral program. Designed as a general exploration into the issues surrounding the development of a STEM literate populace through education. This exploration will be facilitated by a blend of readings, discussions, and personal reflections.

EDUS 7520 - STEM Technology Seminar

Lec. 1. Cr. 1.

Prerequisite: Admission to doctoral program. Focused on STEM-specific technologies (e.g., Vernier probes, TI-Navigation systems, LoggerPro software, etc.), how to use them, and the issues surrounding their use in STEM education.

EDUS 7530 - STEM Education Research

Lec. 3. Cr. 3.

Prerequisite: Admission to doctoral program; EDU 7420 or EDU 7010. Survey of the educational research practices of STEM disciplines; investigates the approaches used in studying the teaching/learning processes within the context of each discipline; similarities, distinctions and overlaps among questions posed, research designs, and investigations into best practices with respect to improving teaching and learning among STEM disciplines.

EDUS 7540 - STEM Education Pedagogy

Lec. 3. Cr. 3.

Prerequisite: Admission to doctoral program. Signature pedagogies unique to the fields of science, technology,

engineering, and mathematics (STEM) education; strengths and limitations associated with signature pedagogies; and insights into pedagogical strategies that can serve to enhance practices within chosen STEM fields.

EDUS 7550 - STEM Education Trends and Issues

Lec. 3. Cr. 3.

Prerequisite: Admission to doctoral program. Introduction to contemporary P-16 STEM education trends and issues, including both integrative and within-discipline trends/issues. Topics such as STEM literacy, integrative STEM teaching/learning, purposeful design and inquiry, legislative initiatives, and change theory are among those addressed in this course.

EDUS 7560 - STEM Learners and Learning

Lec. 3. Cr. 3.

Prerequisite: Admission to doctoral program. Designed to explore the theoretical bases for STEM learning. Topics will include the development of STEM learning environments; research on learning in STEM; and STEM learner exceptionalities.

EDUS 7570 - STEM Education Policy & Leadership

Lec. 3. Cr. 3.

Prerequisite: Admission to doctoral program. The course explores topics in STEM education with attention to STEM education policy and leadership.

EDUS 7580 - STEM Education Field Study

Lec. 2. Cr. 2.

Prerequisite: Admission to doctoral program. Applied study in one or more educational institutions. Research, evaluation, curricular, and instructional STEM projects are examples of appropriate areas of study.

Exercise Science

EDUH 7000 - Current Issues in Exercise Science, Health Behavior, and Wellness Education

Cross-listing: EXPW 7000

Lec 3. Cr. 3.

The content of this course will vary according to current research and publications in areas of exercise science, health behavior, and wellness education related to exercise and physical activity.

EDUH 7010 - Pedagogical Theory of Physical Education

Cross-listing: EXPW 7010

Lec. 3. Cr. 3.

This course will cover interpretation and critical analysis of research on selected topics related to teaching and instruction in physical education.

EDUH 7020 - Advanced Teaching in Exercise Science and Health Related Fields

Cross-listing: EXPW 7020

Lec 3. Cr. 3.

This course is designed to provide knowledge, opportunity, and support for quality teaching in exercise science and related health fields. Methodology of teaching in higher education will be explored.

EDUH 7100 - Biomechanics of Human Movement

Lec 3. Cr. 3.

Prerequisite: Admission to the doctoral program. This course will cover kinetic and kinematic principles governing efficient human movement. Selected methods of analyzing human movement will be covered.

EDUH 7200 - Foundations of Health Promotion

Lec 3. Cr. 3.

Prerequisite: Admission to the doctoral program. This course is designed to provide focus on health promotion and behavior changing strategies. Individual, interpersonal, organizational, community, and public policy will be considered as potential factors that can inhibit or promote behavior change specifically related to health issues.

EDUH 7300 - Behavioral Aspects of Physical Activity

Lec 3. Cr. 3.

Prerequisite: Admission to the doctoral program. This course will include topics such as the effects exercise has on mental health, behavior change theories applied to mental health effects of exercise, behavior change theories applied to physical activity, and physical activity determinants and interventions.

EDUH 7500 - Health Behavior and Wellness Education Research

Cr. 3.

Prerequisite: Admission to the doctoral program. Students will read, interpret, and critique scientific research.

EDUH 7520 - Inquiry in Health Behavior and Wellness Education

Cr. 1-4.

Prerequisite: Admission to the doctoral program. Students will conduct research. Can be repeated for up to 12 hours credit.

EDUH 7600 - Special Topics in Exercise Science

Cross-listing: EXPW 7600

Cr. 1-3.

This course is designed to provide students with the opportunity to review literature on topics they are interested in and to write a literature review. The intent is for the candidate to expand their knowledge base, gain factual information about topics of interest, and identify options for future research projects.

EDUH 7610 - Independent Study in Exercise Science/ Health Behavior and Wellness Education

Cross-listing: EXPW 7610

Cr. 1-3.

Topics to be assigned and approved by instructor and advisor.

EXPW 4042 (5042) - Health Promotion

Lec. 3. Cr. 3.

Evaluation of various physical activity behavior change models and assessment of health promotion programs and evaluation standards.

EXPW 4440 (5440) - Physiology of Exercise

Lec. 3. Cr. 3.

A study of the physiological effects of exercise, sports, and other stresses on various systems of the human body, and the application of physiological principles to physical fitness, athletic training, and rehabilitation therapy programs.

EXPW 4520 (5520) - Adapted Physical Activity and Sport

Lec. 3. Cr. 3.

The purpose of this course is to guide students in developing knowledge of current trends and concepts in adapted physical education and sport as well as examining various services, programs and requirements for individuals with disabilities. By the end of the course students should display acceptable levels of confidence in screening children who may need adapted physical education/activity as well as working with and evaluating special needs children. Design and implementation of adapted physical activity & sport programs to meet unique needs of individuals will also be required.

EXPW 4730 (5730) - Assessment and Evaluation in Exercise Science

Lec. 3. Cr. 3.

The purpose of this course is to direct students to select/construct, administer, score, and evaluate tests specific to human performance. Students will be exposed to standardized tests and will explore the uses and development of authentic tests. Each class period consists of lecture and administration of assessments.

EXPW 5500 - Perspectives on Physical Education, Fitness and Sport Programs

Lec. 3. Cr. 3.

The purpose of this course is to survey the discipline of kinesiology. The course will examine the nature and importance of physical activity professions. Focus will also be placed on the integrative nature of the discipline.

EXPW 5850 - Workshop in Health and/or Physical Education

Lec. 3. Cr. 3.

Laboratory approach providing opportunities for experienced school and nonschool personnel to study in-depth Health and/or Physical Education problems.

EXPW 5940 - Fitness and Wellness

Lec. 3. Cr. 3.

The purpose of this course is to promote an appreciation for physical fitness and wellness and its importance for the individual and the nation. The course includes knowledge, principles, and activities regarding the components of physical fitness, nutrition, chronic disease, and substance abuse that will help the individual achieve a high level of fitness and wellness and to maintain it over a lifetime.

EXPW 6042 - Wellness Promotion

Lec. 3. Cr. 3.

This course introduces students to the key components of wellness. Students will become familiar with assessing health risk of the general population and special populations. Students will describe the epidemiology of physical activity and health and develop critical thinking skills to plan, implement, and evaluate a health promotion program.

EXPW 6100 - Instruction in Physical Education

Lec. 3. Cr. 3.

Principles of instruction and application of developmentally appropriate instructional strategies in school-based physical activity settings.

EXPW 6140 - Assessment and Strategies for Adapted Physical Education

Lec. 3. Cr. 3.

This course is designed to assist teachers in understanding and implementing programs of physical education and sports for students with disabilities and/or special needs. Foundational Topics will be examined as well as the unique differences of persons with disabilities. Developmental consideration will be discussed and activities for this special population will be identified.

EXPW 6210 - Curriculum Design in Physical Education

Lec. 3. Cr. 3.

Candidates will develop an understanding of curriculum development, obtain adequate skills and knowledge to deal with planning decisions related to curriculum development and implementation, gain understanding of implementation of physical education curricula and evaluate the curriculum as a whole.

EXPW 6230 - Seminar in Exercise Science

Cr. 3.

This course is designed as an introductory course that will look closely at the processes and procedures of being a successful student in the on-line master's program in Exercise Science. Orientation to the program will be included. An advanced program with multiple concentration choices in the Exercise Science field is challenging but should not present surprises to the students. This class is required in the first semester of study, and will provide needed and relevant information that will serve the student well in the prospective concentrations.

EXPW 6240 - Assessment in Exercise Science

Lec. 3. Cr. 3.

The purpose of this course is to direct students to select, construct, and evaluate tests specific to human performance. Students will be exposed to applying statistical tools by using EXCEL to evaluate specific tests. Students will learn how to construct tests that are reliable and valid.

EXPW 6250 - Applied Motor Development and Motor Learning

Lec. 3. Cr. 3.

The purpose of this course is to assist practitioners in understanding the principles of motor development and motor learning. Students will discover methods for designing effective and successful learning environments for the development of motor skills in children, youth and adults.

EXPW 6350 - Instructional Strategies for Physical Education

Lec. 3. Cr. 3.

This course is designed to explore research and advanced techniques for teaching elementary school physical education. The course will include the study of a variety of developmentally appropriate pedagogical strategies.

EXPW 6370 - Instructional Strategies for Lifetime Wellness

Lec. 3. Cr. 3.

Study of research and advanced techniques for teaching lifetime wellness.

EXPW 6440 - Physiology of Exercise

Lec. 3. Cr. 3.

Study of the immediate and long term effects of physical activity on the acute and chronic effects of physical activity on body systems with regard to the neuromuscular, energy, respiratory and cardiovascular systems with reference to exercise evaluation and prescription.

EXPW 6450 - Teaching Middle School Physical Education

Lec. 3. Cr. 3.

This course is designed to assist teachers in understanding middle school students and their unique needs, to identify and define the need for quality physical education programs in middle schools, and to prepare teachers for the inclusive duties of a teacher in a quality middle school physical education program.

EXPW 6510 - Research Methods

Lec. 3. Cr. 3.

Prerequisite: EXPW 6240 - Assessment in Exercise Science The purpose of this course is to prepare students to search, cite, and reference research articles properly. Students will learn to write correct research hypotheses and be able to properly cite information using the APA manual throughout the remaining graduate curriculum. Students will also be required to select a topic appropriate for their research project.

EXPW 6520 - Research Project

Lec. 3. Cr. 3.

Prerequisite: EXPW 6510 - Research Methods Examination of current literature in area of study in sport, physical education, and wellness, resulting in an original piece of work. Emphasis will be placed on the evaluation of best practices in a clinical setting.

EXPW 6530 - Qualitative Research in Exercise Science

Lec. 3. Credit 3.

This course focuses on research in exercise science, sport, health and related fields from qualitative perspectives. Introduction to major historical and contemporary paradigms, research design, methods of data collection and analysis, interpretation, ethics, validity and decisions for writing will be examined. A qualitative research proposal will be designed in this course.

EXPW 6550 - Capstone Project

Lec. 3. Credit 3.

Prerequisite: Completion of EXPW 6510 and EXPW 6530 and 80% of core courses or permission of instructor. This capstone course provides the opportunity for students to culminate all aspects of this graduate program through development of a final project based on concentration course content and either quantitative or qualitative research methods. Student will present the final project to classmates and professor.

EXPW 6590 - Field Experience

Lec. 3. Cr. 3.

On site practical field experience in a qualified setting in the student's major area of emphasis, where valuable practice is gained as a professional.

EXPW 6595 - Field Experience in Physical Education

Cr. 3.

Prerequisite: Admission to Teacher Education; completion of EXPW 6210, EXPW 6350 and EXPW 6450.

Corequisite: EXPW 6100 and EXPW 6881. This field experience will be for students who are seeking a teaching license only. Admission is by permit only from the instructor. Taken in conjunction with EXPW 6100 – Instruction in Physical Education and EXPW 6881 – Professional Seminar in Physical Education, the student will participate in a minimum of 72 hours in a practical classroom setting. During this field experience, the student will observe in at least one high school, one middle school and one elementary school physical education class and then choose placement in one of the areas to complete the practicum/methods of teaching experience. This is preparation for student teaching and success in the EdTPA assessment process. Must make a B or better to continue on to student teaching.

EXPW 6600 - Special Topics in Exercise Science

Cr. 1-3.

This course is designed to allow students the opportunity to conduct research on a topic(s) they are interested in and to write summative evaluations of their findings. The intent is for the candidate to expand their options for the research project or to gain factual information about topics of interest that are directly related to their chosen areas of concentration.

EXPW 6700 - Independent Study

Cr. 1-3.

Prerequisite: Restricted to Master of Arts students only. Topics to be assigned and approved by instructor and advisor.

EXPW 6710 - Leadership and Management in Sport

Lec. 3. Cr. 3.

This course provides sport practitioners with a working knowledge of the administrative, managerial, supervisory, and leadership processes in managing sports organizations. The developments of competencies in these areas are designed to emphasize the importance of academic training of competent professionals.

By the end of this course, sports practitioners should be able to describe theoretical concepts in management and decision-making; describe concepts of strategic planning; describe the benefits and limitations of various leadership styles; identify professional and collegiate sport governance entities; and articulate principles in human resource management, conflict resolution, and negotiation.

EXPW 6720 - Legal, Ethical & Risk Management Issues in Sport Management

Lec. 3. Cr. 3.

This course will provide the sport practitioner valuable knowledge and insight of the process of developing a comprehensive risk management plan to eliminate or minimize loss exposure for injuries to participants and spectators and avoid financial loss. This course content includes: tort liability issues, informed consent, product liability, safe transportation, youth sport and the law, risk management for physical educators, playground risk management and safety, liability and property insurance for sport organizations, administering sport medicine, blood borne pathogens, emergency medical preparedness, ADA and sport facilities, sudden death in competition, Title IX

fundamental, drug testing in the NCAA, security issues at sports events, fitness center safety, accommodating individuals with disabilities in regular sports programs, and how to develop a successful risk management plan.

EXPW 6730 - Administration and Supervision of Sport

Lec. 3. Cr. 3.

This course is designed to examine issues faced by administrators, athletic directors, coaches and recreational professionals. The sport practitioner will examine effective decision-making specific to planning, organizing and staffing in sport and leisure settings. The content for this course includes: budgeting and management specific to facilities, equipment and personnel, the role of human resource, administration and management in physical education and sport, budgeting, purchasing and maintenance, fund raising and partnerships, and principles of law and risk management.

EXPW 6740 - Sport Marketing and Promotions

Lec. 3. Cr. 3.

This course will share effective sports marketing methods for the sport practitioner to implement and market in the 21st century world of sport. This course content includes: marketing mix, understanding ethics as it relates to successful sport marketing, promotions and sponsorships, consumer behavior, understanding the role of technology and its effects on sport marketing, branding, market segmentation, data-based marketing, understanding the role of research in marketing, and developing a successful marketing plan.

EXPW 6750 - Design & Management of Leisure & Sport Facilities

Lec. 3. Cr. 3.

This course will provide the sport practitioners with knowledge of how to properly operate and manage a sport facility. Sport facilities are changing at a rapid pace. Sport facility management represents one of the fastest growth areas in the sport industry. With new arenas, stadiums, health clubs, convention centers, and other facilities popping up all over the nation, numerous job opportunities are available in this discipline. Even in these tough economic times when some jobs are harder to find, there is still a significant need for properly trained sport facility managers. This class will cover numerous issues from construction-related concerns to marketing facilities, naming rights, and concession concerns. This is a comprehensive course focusing on applied rather than theoretical knowledge.

EXPW 6760 - Internship in Sport Management

Lec. 3. Cr. 3.

The internship is intended to provide sport practitioners with work skills knowledge and practices in the world of managing sports. Sport practitioners will be placed in a sport management environment to successfully complete 150 hours. Upon completions, sport practitioners will have to develop a successful portfolio for submission. The portfolio should demonstrate a working knowledge and observation of the entire internship experience.

EXPW 6880 - Student Teaching in Physical Education

Cr. 9.

Prerequisite: Admission to Teacher Education and completion of EXPW 6100, EXPW 6595 and EXPW 6881 with a grade of B or better to continue. This course is the clinical experience for pre-service teachers to work in a classroom setting teaching physical education. This is a full time experience for 1 semester in which the candidate must plan and teach age and developmentally appropriate standards based lessons. In addition, the candidate will complete the EdTPA assessment to be submitted to Pearson for scoring during this semester/this class.

EXPW 6881 - Professional Seminar in Physical Education

Cr. 2.

Prerequisite: Admission to Teacher Education. Corequisite: EXPW 6100 and EXPW 6595. This seminar class is designed to assist the pre-service teacher in understanding the EdTPA process as well as provide practice in writing and being evaluated in the EdTPA model. Taken in conjunction with EXPW 6100 and 6595 provides material and opportunity for the candidate to practice the EdTPA assessment. Students may be asked to travel to the main campus during this semester.

EXPW 6990 - Research and Thesis

Cr. 3, 6.

EXPW 7000 - Current Issues in Exercise Science, Health Behavior, and Wellness Education

Cross-listing: EDUH 7000

Lec 3. Cr. 3.

The content of this course will vary according to current research and publications in areas of exercise science, health behavior, and wellness education related to exercise and physical activity.

EXPW 7010 - Pedagogical Theory of Physical Education

Cross-listing: EDUH 7010

Lec 3. Cr. 3.

This course will cover interpretation and critical analysis of research on selected topics related to teaching and instruction in physical education.

EXPW 7020 - Advanced Teaching in Exercise Science and Health Related Fields

Cross-listing: EDUH 7020

Lec 3. Cr. 3.

This course is designed to provide knowledge, opportunity, and support for quality teaching in exercise science and related health fields. Methodology of teaching in higher education will be explored.

EXPW 7600 - Special Topics in Exercise Science

Cross-listing: EDUH 7600

Cr. 1-3.

This course is designed to provide students with the opportunity to review literature on topics they are interested in and to write a literature review. The intent is for the candidate to expand their knowledge base, gain factual information about topics of interest, and identify options for future research projects.

EXPW 7610 - Independent Study in Exercise Science/ Health Behavior and Wellness Education

Cross-listing: EDUH 7610

Cr. 1-3.

Topics to be assigned and approved by instructor and advisor.

Finance

FIN 6020 - Financial Management

Lec. 3. Cr. 3.

A case study course surveying tools, techniques, and applications of business financial management.

FIN 6350 - Small and Micro-Cap Portfolio Management

Lec. 3. Cr. 3.

Prerequisite: FIN 6020 . A case course rigorously applying investment theory to the management of a real portfolio of small and micro-capitalization common stocks.

FIN 6460 - Securities and Portfolio Analysis

Lec. 3. Cr. 3.

An upper level coverage of security and portfolio analysis, crucial to anyone pursuing a career in finance, especially in the financial markets area. A study of the impact of economic factors and security markets on individual security and portfolio values.

FIN 6470 - Investment Challenge I

Lec. 3. Cr. 3.

Prerequisite: FIN 6020 and permission of instructor. Advanced portfolio theory through actual management of a real investment portfolio.

FIN 6480 - Investment Challenge II

Lec. 3. Cr. 3.

Prerequisite: FIN 6020 and permission of instructor. Advanced portfolio theory through actual management of a real investment portfolio.

FIN 6710 - Perspectives of Risk and Insurance

Lec. 3. Cr. 3.

FIN 6710 examines the economic principles underpinning risk and insurance and introduces key risk and insurance concepts and practices. The causes of change in risk management and insurance are examined through exploration of relevant physical, technological, cultural, regulatory, and other environmental perspectives.

FIN 6720 - Corporate Risk Management

Lec. 3. Cr. 3.

Application of the risk management process, including risk control and risk financing techniques, to risk management problems in business. Emphasizes risk identification and evaluation, together with alternative methods of risk control and risk financing techniques.

FIN 6730 - Risk Management Modeling

Cr. 3.

This course will introduce students to mathematical and simulation modeling of risk. The first part of the course reviews the basic mathematics of optimization, and then develops conceptual models of preference and choice. These models are then used to model uncertainty, risk aversion, and theories of information. The second part of the course reviews statistics, introduces students to simulation, and then provides hands-on experience with simulation modeling.

FIN 6740 - Current Issues in Risk Management and Insurance

Lec. 3. Cr. 3.

Prerequisite: Either FIN 6710, FIN 6720, or FIN 6730. This course is an in-depth study of current topics in risk management and insurance. Topics will include, but are not limited to, insuring against and managing risks associated with natural and anthropogenic catastrophic events.

FIN 6900 - Special Topics

Lec. 3. Cr. 3.

A case course dealing with current topics in business.

FIN 6910 - Multinational Finance

Lec. 3. Cr. 3.

International markets and instruments, global financing strategies, global capital budgeting, global working capital management, international tax planning.

FIN 6920 - Banking and Financial Services

Cr. 3.

This course is an interactive seminar designed to study and discuss critical issues facing the financial services industry. Topics include the economic, regulatory, competitive environment and the wide range of services provided by today's banking institutions. The course will address economic policy, globalization, investment and commercial banking, insurance, pension plans, risk management, and technology. Financial analysis and leadership issues will also be addressed in course lectures, online discussions, and within the context of the competitive and interactive Stanford Bank Simulation.

Foundations of Education

FOED 6020 - Perspectives in American Education

Lec. 3. Cr. 3.

Study of theory, practice, and reform in American Education: a sociological and historical perspective.

FOED 6060 - Education in a Diverse Culture

Lec. 3. Cr. 3.

A study of educational practices and diversity from a multicultural perspective.

FOED 6320 - Educational Applications of Technology

Lec. 3. Cr. 3.

Review and application of basic computer competencies as related to a variety of educational tasks.

FOED 6400 - Principles and Techniques of Working with Student Teachers

Lec. 3. Cr. 3.

Prerequisite: Consent of instructor. Principles and techniques of cooperative work with student teachers. Includes practical exercises in planning, teaching, and evaluation.

FOED 6800 - Field Experience

Cr. 1-3.

Practical field experience in student's major area of emphasis.

FOED 6820 - Applied Educational Assessment

Lec. 3. Cr. 3.

This course considers statistical techniques for describing and summarizing numerical data for educational research studies, and interpretation/evaluation of educational assessment data. Applied descriptive and inferential statistics, classroom test construction and improvement, and standardized testing applications will be considered within the context of the classroom and school improvement.

FOED 6840 - Field Experiences in ESL

Lab. 4-12. Cr. 1-3.

Prerequisite: ESLP 4100 (5100); full admission to the Teacher Education Program. Supervised work experiences in public schools, stressing the translation of theory into practice and focusing on teaching English Language Learners in PreK-12 settings. A minimum grade of B is required to meet degree requirements for licensure candidates.

FOED 6920 - Educational Research

Lec. 3. Cr. 3.

Qualitative and quantitative research methods in education.

FOED 6980 - Qualitative Research in Education

Lec. 3. Cr. 3.

A study of Qualitative Research applications and analysis of design and selected research techniques.

FOED 7020 - Philosophy and Public Policy

Lec. 3. Cr. 3.

A philosophical analysis of educational theories and public policy.

French

FREN 4100 (5100) - Advanced Listening

Lec. 3. Cr. 3.

Prerequisite: FREN 2020 or equivalent. Development of listening acuity and general comprehension of commercially produced as well as authentic spoken texts. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

FREN 4600 (5600) - Middle Ages and 16th Century Literature

Sem. 1. Cr. 1.

Selections from one (1) or more of: La Chanson de Roland or other epics; Rabelais, Montaigne. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

FREN 4610 (5610) - 17th Century Literature

Sem. 1. Cr. 1.

Selections from one (1) or more of: Pascal, Corneille, Racine, Moliere. students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

FREN 4620 (5620) - 18th Century Literature

Sem. 1. Cr. 1.

Selections from one (1) or more of: Voltaire, Diderot, Rousseau, Marivaux, Beaumarchais. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

FREN 4630 (5630) - 19th Century Literature

Sem. 1. Cr. 1.

Selections from one (1) or more of: Balzac, Stendhal, Lamartine, Vigny, Hugo, Musset. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

FREN 4640 (5640) - 20th Century Literature

Sem. 1. Cr. 1.

Selections from one (1) or more of: Proust, Mauriac, Malraux, Camus, Sartre. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

FREN 6010 - Special Topics in French

Read. 1-4. Cr. 1-4.

Concentrated readings in areas of special interest. Available to graduate students minoring in French, with consent of departmental chairperson. (Maximum of 12 credits.)

Geography

GEOG 4210 (5210) - Cartography

Lec. 2. Lab. 2. Cr. 3.

Principles and practices of map construction and interpretation. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

GEOG 4410 (5410) - Remote Sensing

Cross-listing: GEOL 4410 (5410)

Lec. 2. Lab.2. Cr. 3.

Prerequisite: GEOL 2500. Principles and applications of remote sensing. Provides a survey of the concepts and techniques of remote sensing and image analysis for natural resources, geomorphology and Earth surface processes. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

GEOG 4510 (5510) - Theory of GIS I

Lec. 3. Cr. 3.

Prerequisite: Permission of instructor. Introduction to (1) PC ARC/INFO GIS package, (2) ArcView GIS package, and (3) the integration of Global Positioning Systems (GPS) with GIS. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

GEOG 4511 (5511) - Theory of GIS II

Lec. 3. Cr. 3.

Prerequisite: Consent of instructor and GEOG 4510 (5510). Intermediate principles of GIS using ArcGIS and ArcView packages. Advanced integration of GPS with GIS. Spatial analysis and modeling capabilities of GIS emphasized. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

GEOG 4520 (5520) - Advanced Vector-based Geographic Information Systems (GIS)

Cr. 3.

Prerequisite: GEOG 4510 (5510) and consent of instructor. Selected topics from basic course will be covered in greater detail, and advanced topics will be introduced. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

GEOG 4620 (5620) - Principles of GIS

Lec. 3. Cr. 3.

Introduction to the fundamentals of GIS. Theoretical and technical principles of managing and processing geographic data, nature of geographic data, spatial data models of map projection systems, kriging, structures and spatial analytical and modeling techniques. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

Theoretical and technical principles of managing and processing geographic data, nature of geographic data, spatial data models of map projection systems, kriging, structures and spatial analytical and modeling techniques. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

GEOG 4650 (5650) - Environmental Applications of GIS

Lec. 3. Cr. 3.

Prerequisite: GEOG 4510 (5510). Applications of GIS in environmental sciences and engineering. Main emphasis is on approaches, scripting, and modeling exercises. Covers the scope of ecosystems, forestry, drainage basins, pollution modeling, and spatial analysis of contaminants in various environments using GIS as the main tool of analysis. Completion of a real-world GIS project is required. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

GEOG 4711 (5711) - Hydrogeology

Cross-listing: GEOL 4711 (5711)

Lec. 3. Lab. 2. Cr. 4.

Prerequisite: GEOL 1040 and GEOL 1045. Occurrence and movement of ground water, well hydraulics, water quality, and pollution. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

GEOG 4850 (5850) - Advanced GIS

Lec. 3. Cr. 3.

Prerequisite: GEOG 4510 (5510)/GEOG 4520 (5520) Advanced topics in GIS, including writing of avenue scripts, writing and importing Visual Basic scripts, customization of the interface; customization of spatial, network and 3D extensions of ArcView and AML. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

GEOG 5150 - Geomorphology

Cross-listing: GEOG 4150

Lec. 3. Lab. 2. Cr. 4.

Analysis of landforms and processes that shape them. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

Geology

GEOL 4150 (5150) - Geomorphology

Cross-listing: GEOG 5150

Lec. 2. Lab. 4. Cr. 4.

Prerequisite: GEOL 2500. Analysis of landforms and processes that shape them. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

GEOL 4300 (5300) - Environmental Aqueous Geochemistry

Lec. 3. Cr. 3.

Prerequisite: GEOL 1040, CHEM 1010 or CHEM 1110, or consent of instructor.

GEOL 4320 (5320) - Petroleum Geology

Lec. 2. Lab. 2. Cr. 3.

Prerequisite: GEOL 3230 and 4110. Origin and accumulation of petroleum and natural gas. Subsurface exploration techniques involving geophysical well-logs and seismic stratigraphy. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

GEOL 4330 (5330) - Environmental Geology

Lec. 2. Lab. 2. Cr. 3.

Application of geologic knowledge to the solution of problems arising from the interaction of human activities and natural earth processes. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

GEOL 4410 (5410) - Remote Sensing

Cross-listing: GEOG 4410 (5410)

Lec. 2. Lab. 2. Cr. 3.

Prerequisite: GEOL 2500. Principles and application of remote sensing. Provides a survey of the concepts and techniques of remote sensing and image analysis for natural resources, geomorphology and Earth Surface processes. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

GEOL 4650 (5650) - Applied Geochemistry

Lec. 3. Cr. 3.

Prerequisite: GEOL 1040 and CHEM 1110. Application of geochemistry to mineral exploration, environmental pollution, public health and geologic hazards. Three (3) field trips required. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

GEOL 4711 (5711) - Hydrogeology

Cross-listing: GEOG 4711 (5711)

Lec. 3. Lab. 2. Cr. 4.

Prerequisite: GEOL 1040 and GEOL 1045. Occurrence and movement of groundwater, well hydraulics, water quality and pollution. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

GEOL 4720 (5720) - Advanced Hydrogeology

Lec. 3. Cr. 3.

Prerequisite: GEOL 4710 (5710) and MATH 1810 (MATH 1820 is recommended) or consent of instructor. Methods of aquifer remediation and groundwater modeling, case studies of groundwater contamination. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

GEOL 4810 (5810) - Special Problems

Cr. 1-4.

Prerequisite: Major and consent of instructor. Advanced students may do independent investigations in some approved field. May be repeated for credit. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

GEOL 4820 (5820) - Special Problems

Cr. 1-4.

Prerequisite: Major and consent of instructor. Advanced students may do independent investigations in some approved field. May be repeated for credit. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

German

GERM 4100 (5100) - Advanced Listening

Lec. 3. Cr. 3.

Prerequisite: GERM 2020 or equivalent. Development of listening acuity and general comprehension of commercially produced as well as authentic spoken texts. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

GERM 4610 (5610) - 18th Century Literature

Sem. 1. Cr. 1.

Selections primarily from Lessing, Schiller, or authors of the Sturm und Drang. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

GERM 4620 (5620) - Goethe

Sem. 1. Cr. 1.

Goethe's poetry, plus, upon demand, Goethe's dramas or prose. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

GERM 4630 (5630) - Romanticism

Sem. 1. Cr. 1.

Selections from the poetry and prose of one or more of the major writers of the period, including Heinrich von Kleist. Students enrolled in the 5000-level course will be required to complete additional work as stated.

GERM 4640 (5640) - 19th Century Literature

Sem. 1. Cr. 1.

Selections from the prose or drama of one or more of the major writers of the period, including Keller, Storm, Meyer, Hebbel, Hauptmann. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

GERM 4650 (5650) - Thomas Mann

Sem. 1. Cr. 1.

Shorter works such as Tonio Kroeger, Tod in Venedig, Tristan, etc. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

GERM 4660 (5660) - Kafka

Sem. 1. Cr. 1.

A selection of short stories. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

GERM 4670 (5670) - Brecht

Sem. 1. Cr. 1.

One or two selected dramas. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

GERM 4680 (5680) - Post World War II Literature

Sem. 1. Cr. 1.

Choice of authors such as Boell, Grass, Duerrenmatt Frisch, etc. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

GERM 4810 (5810) - Special Topics in German

Lec. 3. Cr. 3.

Prerequisite: GERM 3010. This course may be repeated if the topic is different. Qualified students may be able to take this course without the prerequisite by contacting the instructor. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

GERM 6010 - Special Topics in German

Read.1-4. Cr. 1-4.

Concentrated readings in areas of special interest. Available to graduate students minoring in German, with consent of departmental chairperson. (Maximum of 12 credits.)

Higher Education

Higher Education PhD

HRED 7000 - Seminar in Higher Education

Lec. 1 Cr. 1

Prerequisite: Admission to Doctoral Program. Introductory course to familiarize students with the procedures, requirements, and expectations of the program. Introduces students to a variety of perspectives and roles at higher education institutions. For students in Higher Education concentration only.

HRED 7010 - Trends & Issues in Higher Education

Lec. 3 Cr. 3

Prerequisite: Admission to Doctoral Program. Analyze current trends and issues in higher education and historical circumstances that have led to the current state of post-secondary education. Explore the future state of education, anticipating trends and issues that higher education leaders will likely navigate moving forward.

HRED 7020 - Ethical Aspects of Higher Education

Lec. 3 Cr. 3

Prerequisite: Admission to Doctoral Program. Overview of the ethical theories and influential case studies that have impacted the education system, teaching, learning and student outcomes. Topics addressed include diversity and inclusion, faculty academic freedom, shared governance, freedom of speech, and access and affordability.

HRED 7030 - College and University Finance

Lec. 3 Cr. 3

Prerequisite: Admission to Doctoral Program. Overview of the financial management of higher education institutions. Financial reporting, budgeting, and asset management processes. Examines contemporary funding opportunities for postsecondary institutions.

HRED 7040 - Public Policy & Higher Education Law

Lec. 3 Cr. 3

Prerequisite: Admission to Doctoral Program. Law, legal environment, processes, analysis of law, and legal problems in higher education. Overview of social, economical, cultural, political, and behavioral aspects of higher education policy analysis. Address a modern history of higher education.

HRED 7050 - Educational Technologies, Design, and Innovation in Higher Education

Lec. 3 Cr. 3

Prerequisite: Admission to Doctoral Program. Address and apply current research and theory related to learning, design, and technology with higher education.

HRED 7110 - Trends & Structure of Higher Education Administration

Lec. 3 Cr. 3

Prerequisite: Admission to Doctoral Program. Investigates administrative trends and issues common across colleges and universities from a variety of perspectives. Organizational patterns and structure, roles and partnerships, curricular processes and program development in the higher education administrative setting.

HRED 7120 - Organizational & Leadership Theories

Lec. 3 Cr. 3

Prerequisite: Admission to Doctoral Program. Incorporates culture, policy and resource development, and leadership theories in an organizational setting. Presents a perspective of organizational theory through historical and developmental contexts. Includes conceptual models of learning and leadership related to decision-making strategies.

HRED 7130 - Leadership Development & Transformation

Lec. 3 Cr. 3

Prerequisite: Admission to Doctoral Program. Overview of basic concepts and theories of leadership. Emphasis placed on implementing leadership theory to analyze various situations and create and apply solutions for effective organizational transformation.

HRED 7140 - College Access, Affordability, & Student Success

Lec. 3 Cr. 3

Prerequisite: Admission to Doctoral Program. Incorporates historical investments in college access and affordability, as well as costs, debts, and other barriers for entrance and success at the university level. Study supports and outcomes associated with success, persistence, and completion.

HRED 7150 - Program Planning, Evaluation, and Assessment for Higher Education Administrators

Lec. 3. Credit 3.

Prerequisite: Admission to Doctoral Program. Planning and evaluation of various programs and initiatives related to higher education administration to determine effectiveness and ability to meet designated goals and objectives. Research on the cycle planning efforts, the evaluation setting, design, analysis, and outcomes. Study of planning, implementation, and improvements to assessments relevant to higher education administrators.

HRED 7210 - Student Personnel Services in Higher Education

Lec. 3 Cr. 3

Prerequisite: Admission to Doctoral Program. Strategic analysis of the various services within student development such as admissions; career development; student success; student affairs; residential life; student activities; Greek life, scholarships; and how leaders can best utilize and collaborate to ensure institutional goals and/or student success outcomes are met.

HRED 7220 - College Students: Culture, Characteristics, & College Life

Lec. 3 Cr. 3

Prerequisite: Admission to Doctoral Program. Examine the dynamics of traditional and non-traditional college

students; emphasis will be placed on identification of student culture and characteristics across higher education institutions.

HRED 7230 - Research-based Student Success

Lec. 3 Cr. 3

Prerequisite: Admission to Doctoral Program. Evaluate postsecondary research that supports student success, including the use of technology and tools to support learning environments, financial and academic barriers, various degree pathways, evidence-based teaching practices and engagement, advisement and support services, career planning, and educational achievement based on socioeconomic, ethnic, racial, cultural, and age variants.

HRED 7240 - Professional Leadership in Student Affairs

Lec. 3 Cr. 3

Prerequisite: Admission to Doctoral Program. Explore and engage in reflective practice and critical reflection relative to leadership in student affairs. The foci will be on leading and managing various units in student affairs, including strategies for effective communication, personnel and conflict management, budgetary decision making, research-based best practices, and leadership styles.

HRED 7250 - Program Planning, Evaluation, and Assessment for Student Affairs Personnel

Lec. 3. Credit 3.

Prerequisite: Admission to Doctoral Program. Planning and evaluation of various programs and initiatives related to student affairs in higher education to determine effectiveness and ability to meet designated goals and objectives. Research on the cycle of planning efforts, the evaluation setting, design, analysis, and outcomes. Study of planning, implementation, and improvements to assessments relevant to student affairs personnel.

HRED 7800 - Practicum in Higher Education

Lab. 3-9 Cr. 3-9

Prerequisite: Admission to Doctoral Program. Field experience in a higher education professional setting.

History

HIST 4010 (5010) - Colonial and Revolutionary Periods

Lec. 3. Cr. 3.

Early American Society; Revolutionary conflict; Confederation and Constitution. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

HIST 4020 (5020) - The Young Republic, 1789-1849

Lec. 3. Cr. 3.

Political, military, social, and cultural history of the U.S., from the era of Washington through the "Age of Jackson" to the Mexican War. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

HIST 4030 (5030) - Civil War and Reconstruction, 1849-1877

Lec. 3. Cr. 3.

Sectionalism and the coming of war; war-time developments; plans of reconstruction and their impact. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

HIST 4040 (5040) - Rise of Modern America, 1877-1912

Lec. 3. Cr. 3.

Industrialism, urbanism, populism, reform and their impact. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

HIST 4050 (5050) - The Transformation of Modern America, 1912-1945

Lec. 3. Cr. 3.

Wilsonian reform, World War I, New Era, New Deal, World War II, with emphasis on changes in politics, the economy, and society. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

HIST 4060 (5060) - Postwar America, 1945-Present

Lec. 3. Cr. 3.

Cold War diplomacy and society, troubled Sixties, post-Watergate politics, contemporary cultural, economic, and social changes. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

HIST 4090-4099 /5090-5099 - Studies in Popular Culture

Lec. 3 Cr. 3

Considers issues relating to the history of popular culture.

HIST 4110-4119(5110-5119) - Appalachian History and Culture

Lec. 3. Cr. 3.

Selected topics relating to the history and culture of Appalachia.

HIST 4200 (5200) - The Old South

Lec. 3. Cr. 3.

This course will focus upon the economic, cultural, educational, racial, and political developments in southern society from its colonial beginnings to the Civil War and Reconstruction. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

HIST 4210 (5210) - The New South

Lec. 3. Cr. 3.

This course will focus upon the economic, cultural, educational, racial, and political developments in southern society from the end of Reconstruction to the present. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

HIST 4230-4239 (5230-5239) - Topics in U.S. Economic History

Lec. 3. Cr. 3.

Selected topics in U.S. economic history. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

HIST 4250 (5250) - American Westward Movement

Lec. 3. Cr. 3.

The frontier experience in American history, with emphasis on the trans-Mississippi West. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

HIST 4290 (5290) - Science and Technology in America

Lec. 3. Cr. 3.

Origins and development of science and technology in the U.S. from the colonial period to the present. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

HIST 4310 (5310) - U.S. Diplomacy

Lec. 3. Cr. 3.

The background, origins, and developments of 20th century American foreign relations. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

HIST 4330-4339 (5330-5339) - Religious Studies

Lec. 3. Cr. 3.

Selected topics in religious history. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

HIST 4350-4359 (5350-5359) - Gender Studies

Lec. 3. Cr. 3.

Selected topics in gender history. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

HIST 4360-4369 (5360-5369) - U.S. Social History

Lec. 3. Cr. 3.

Selected topics in U.S. social history ranging from the colonial period to the present. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

HIST 4370 (5370) - Women in American History

Lec. 3. Cr. 3.

Public and private experiences of women in the United States from the colonial period to the present. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

HIST 4390-4399 (5390-5399) - Topics in African American Studies

Lec. 3-6. Cr. 3-6.

Selected topics in African American History. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

HIST 4400 (5400) - Film Studies

Lec. 2. Lab. 2. Cr. 3.

Selected topics in the history of films. A student may take HIST 4400 twice, provided the topic is different each time. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

HIST 4440-4449(5440-5449) - Native American Studies

Lec. 3. Cr. 3.

Selected topics in Native American history ranging from the earliest times to the present. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

HIST 4470-4479(5470-5479) - Sports Studies

Lec. 3. Cr. 3.

Selected topics in the history of sports. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

HIST 4520 (5520) - Medieval Europe

Lec. 3. Cr. 3.

Evolution of medieval culture from the fall of the Roman Empire to the 13th century and its dissolution during the late medieval period.

HIST 4530 (5530) - Renaissance and Reformation

Lec. 3. Cr. 3.

Europe during age of New Learning; Renaissance and Mannerist art; 16th century Reformation; Wars of Religion. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

HIST 4540 (5540) - Absolutism and Enlightenment

Lec. 3. Cr. 3.

Europe during 17th and 18th centuries; rise of centralized states; dynastic wars, rise of modern science; Enlightenment thought. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

HIST 4550 (5550) - French Revolution and Napoleon

Lec. 3. Cr. 3.

Europe from 1789 to 1815, centering on events in France and political, diplomatic, and military history of the period. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

HIST 4560 (5560) - 19th Century Europe

Lec. 3. Cr. 3.

European politics, diplomacy, society, war, and institutions from 1815 through World War I. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

HIST 4570 (5570) - World War II and the Cold War

Lec. 3. Cr. 3.

Problems of European powers during inter-war years; background, causes, and results of World War II and Cold War. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

HIST 4620 (5620) - Russia

Lec. 3. Cr. 3.

Political, cultural, social, and military history from the Kievan period to the present. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

HIST 4630/5630 - History of France

Lec. 3. Cr. 3.

Prerequisite: None. France has played a significant role in shaping European and world events, both through its international policies and internal developments. This course considers the historical development of France.

HIST 4640 (5640) - History of Modern Germany

Lec. 3. Cr. 3.

This course will primarily focus on the Germanic states and the rise of Germany in the nineteenth century, and the development, division, and reunification in the twentieth century.

HIST 4650 (5650) - England to 1688

Lec. 3. Cr. 3.

Roman, Anglo-Saxon, and Medieval England; Tudor and Stuart dynasties. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

HIST 4660 (5660) - Modern England

Lec. 3. Cr. 3.

England since the Glorious Revolution, with special emphasis on the nineteenth and twentieth centuries. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

HIST 4680 (5680) - The Holocaust

Lec. 3. Cr. 3.

Considers topics relating to the history of the Holocaust.

HIST 4690 (5690) - British Empire and Commonwealth

Lec. 3. Cr. 3.

Origin, development and decline of the British Empire. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

HIST 4710 (5710) - History of Africa

Lec. 3. Cr. 3.

History of Africa with an emphasis on the nineteenth and twentieth centuries.

HIST 4730 (5730) - The Modern Middle East

Lec. 3. Cr. 3.

Consideration of the traditional cultural background of the region, but with emphasis on the rapid changes experienced during the twentieth century. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

HIST 4740 (5740) - History of Japan

Lec. 3. Cr. 3.

Early Japanese history followed by a comprehensive investigation of the 20th century experience. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

HIST 4750 (5750) - History of China

Lec. 3. Cr. 3.

Early Chinese history followed by an emphasis on the 20th century revolutionary experience. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

HIST 4760 (5760) - Vietnam: Its Wars & Their Aftermath

Lec. 3. Cr. 3.

Overview of Vietnam, the French experience, the U.S. war and its impact on America, followed by developments since 1975. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

HIST 4790-4799(5790-5799) - Latin American Studies

Lec. 3. Cr. 3.

Selected topics in Latin American history.

HIST 4810 (5810) - Scientific Controversies

Lec. 3. Cr. 3.

Historical analysis of selected controversies in science and their impact within and outside the scientific community. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

HIST 4885 (5885) - History of Nursing and Healthcare

Lec. 3 3 Credit

This course examines the nature of healthcare and nursing in the United States. Healthcare providers who are not medical doctors are a major factor in filling gaps in healthcare needs, but are also a major contributor to economic production. Nursing is a key case study for this class to examine the politics, economics, and changing nature of professionalization in the United States. Examining the history of the nursing profession also allows students to contextualize and improve the providing of healthcare, through examining the contributions of a group of actors that are often omitted from narratives in the history of medicine. Being able to account for the historical needs and changing nature of the nursing profession allows students insights into potential improvements in healthcare policy and health

savings. Gender is a key analytical category as it allows us to ask larger questions, such as who can participate in the professions and how does gender play an important part in shaping those roles. Controlling analytics for gender also allows us to examine key issues in healthcare such as gaps in pay and unequal access to healthcare.

HIST 6100 - Interdisciplinary Cultural Training

Cross-listing: SOC 6100

Lec. 3. Credit 3.

This will be an active learning course focused on sociology, history, cultures, economics, and language of the Cherokee Nation and Appalachia. It will explore effective strategies to collaboratively solve complex food-energy-water challenges from a culturally responsive perspective.

Horticulture

AGHT 4510 (5510) - Fruit and Vegetable Production

Lec. 2. Lab. 2. Cr. 3.

Prerequisite: AGHT 3400 or 3410, AGRN 4210 (5210), or consent of instructor. Fundamental principles of tree fruit and small fruit, and field and greenhouse vegetable production. Cultural and environmental management; systems of harvesting, storing, marketing. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

AGHT 4530 (5530) - Greenhouse Crop Production

Lec. 2. Lab. 2. Cr. 3.

Prerequisite: AGHT 4420 or consent of instructor. Production, timing, harvesting, and marketing of bedding plants and floricultural crops grown in commercial greenhouses; nutrient film technique. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

AGHT 4940 (5940) - Horticulture Topics

Cr. 1-4.

Prerequisite: Consent of instructor. Special study in an approved area of horticulture under the supervision of a member of the School of Agriculture faculty. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

AGHT 4950 (5950) - Horticulture Topics

Cr. 1-4.

Prerequisite: Consent of instructor. Special study in an approved area of horticulture under the supervision of a member of the School of Agriculture faculty. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

Human Ecology

HEC 5010 - Principles of Nutrition Research

Lec. 3. Cr. 3.

Prerequisite: Admission to the MS in Community Health and Nutrition Program. Principles of research applied to the

study of nutrition-based research questions, including standards of responsible research and evidence-based practice. Students will be required to conduct, analyze, and present an evaluative or applied research project.

HEC 5011 - Personal and Family Finance Education

Lec. 3. Cr. 3.

Advanced study of financial literacy, consumer decision-making and financial responsibilities for individuals and families. Course prepares students for the Personal and Family Financial Educator exam, which with passage to Certification in Personal and Family Financial Educator (CPFFE).

HEC 5015 - Perspectives in Rural Community Health

Lec. 3. Cr. 3.

Emphasis on health promotion, health maintenance, and illness prevention among populations. Analysis of community health resources. Students will recognize and evaluate the interrelationships among individuals, families, and population groups within rural communities in determining health and nutrition needs.

HEC 5025 - Cultural Issues Influencing Health

Lec. 3. Cr. 3.

Identifying the formation and significance of cultural identity among populations as related to food choices, behaviors, and nutritional status. Examining the impact of cultural differences and disparities in health care faced by various groups, especially rural communities and assessment of strategies for disease prevention and intervention.

HEC 5066 - Family Violence Across the Lifespan

Lec. 3. Cr. 3.

A comprehensive review of family violence, abuse and maltreatment across the lifespan using a systems/ecological perspective.

HEC 5201 - Community Nutrition Programs and Services

Lec. 3. Cr. 3.

Introductory nutrition course. Synthesis of social, economic, cultural, and geographic factors on food and nutrition services for families. Analysis of community intervention programs and services as related to disease prevention and food policy issues.

HEC 5230 - Field Experience in Occupational Family and Consumer Sciences - Culinary Arts

Pra 3. Cr. 3.

Prerequisite: Advance approval of instructor. Supervised field experience and seminar in teaching Family and Consumer Sciences related occupations.

HEC 5235 - Principles of Food Production and Preparation

Lec 3. Cr. 3.

Prerequisite: Fundamental nutrition course or consent of instructor. Principles of food production and preparation including functions and sources of nutrients; factors that affect food quality and nutrient retention; cultural influences and global factors that affect production, supply and distribution of food; food acquisition, safety, sanitation, preparation and service of food to promote individual and family well-being.

HEC 5241 - Quantity Food Production

Lec. 2. Lab. 2. Cr. 3.

Prerequisite: HEC 3240 or appropriate food service work experience. Management and preparation of quality food in quantity; systems theory of management; advanced food safety and sanitation. Serv Safe certification offered.

HEC 5242 - Foodsystems Administration

Lec. 3. Cr. 3.

Prerequisite: HEC 5240 Systems approach to food service administration. Legal issues in food and nutrition services. Personnel management and employment topics.

HEC 5420 - Current Housing Issues

Lec. 3. Cr. 3.

New developments in housing including current and emerging trends: Age appropriate needs for housing throughout the human lifespan.

HEC 5430 - Textiles and Apparel in the Global Economy

Lec. 3. Cr. 3.

Evaluation of key issues facing textiles and apparel businesses operating supply chains and sourcing in the global economy considering economic, political, and social perspectives and professional implications.

HEC 5440 - New Developments in Textiles and Apparel

Lec. 3. Cr. 3.

New developments in textiles and apparel including fiber, yarn, fabric, apparel design, production, evaluation, quality control, retailing and forecasting.

HEC 5960 - Independent Study

Lec. 1-3

Special study of an approved topic (area) within Human Ecology under the supervision of a member of the Human Ecology graduate faculty. Up to six credit hours may be earned by Independent Study.

HEC 6010 - Theories of Human Development

Lec. 3. Cr. 3.

A study of Human Development theories across the lifespan with cross-cultural exploration. Application of developmental perspectives to research and professional practice in human development.

HEC 6020 - Nutrition Science

Lec. 3. Cr. 3.

Advanced concepts of nutrition and health. Emphasis upon the function, food sources, recommended intake, food safety and assimilation of each of the six nutrient classes. Application of nutrition education practices in the classroom and community.

HEC 6200 - Theories and Applications in Child Development

Lec. 3. Cr. 3.

A topical approach to theories and emerging issues in child development; an exploration of environmental and hereditary factors impacting child development with emphasis on at-risk population and children with exceptionalities.

HEC 6201 - Community Nutrition Programs and Services

Lec. 3. Cr. 3.

Prerequisite: HEC 5025. Synthesis of social, economic, cultural, and geographic factors on food and nutrition services for families. Analysis of community intervention programs and services as related to disease prevention and food policy issues; emphasis on rural communities.

HEC 6220 - Theories in Child Guidance and Behavior

Lec. 3. Cr. 3.

A theoretical approach to understanding environmental and hereditary factors impacting child guidance strategies and behavior with emphasis on at-risk population and children with exceptionalities.

HEC 6225 - Advanced Applications of Counseling Techniques

Lec. 3. Cr. 3.

An in depth exploration of historical and theoretical/philosophical foundations of delivering mental health counseling services in the context of the larger social services system. Also addresses issues of diversity in the application of counseling models, intervention, and service delivery to promote healthy behavior change.

HEC 6240 - Developmentally Appropriate Practice & Creative Play

Lec. 3. Cr. 3.

Developmentally appropriate practice and emphasis on creative play techniques in educational and social service areas. This course can be added to the 30 credit curriculum by professionals with licensure seeking endorsement in Early Child Care Services (451).

HEC 6250 - Experiential Learning Practicum: Foodservice Management/Extended Care

Cr. 3.

Application and integration of food systems management and extended care knowledge and skills in a professional setting.

HEC 6251 - Experiential Learning Practicum: Community Nutrition

Cr. 3.

Prerequisite: HEC 6250 and admission to the MS in Community Health and Nutrition program. Application and integration of community nutrition knowledge and skills to individuals, families and communities. Emphasis is placed on interaction with clients in rural community settings.

HEC 6252 - Experiential Learning Practicum: Clinical Nutrition

Cr. 3.

Prerequisite: HEC 6251 and admission to the MS in Community Health and Nutrition program. Integration and application of knowledge and skills in medical nutrition therapy in a professional setting.

HEC 6253 - Experiential Learning Practicum: Elective Experience

Cr. 3.

Prerequisite: HEC 6252 and admission to the MS in Community Health and Nutrition program. Integration and application of clinical, community and foodservice knowledge and skills in a variety of settings; including sports nutrition and professional meetings.

HEC 6300 - Aging and Gerontology: Issues Impacting our Society

Lec. 3. Cr. 3.

A topical approach to emerging issues in the aging population, with emphasis on advocacy and services for individuals and families in the later stages of the life span.

HEC 6405 - Nutrition Across the Life Cycle

Lec. 3. Cr. 3.

Prerequisite: HEC 6225 Examination of the nutritional needs of individuals during critical ages and stages of development. Assessing and promoting health throughout the life cycle, including consequences of over- and under-nutrition.

HEC 6410 - Nutrition and Aging

Lec. 3. Cr. 3.

Review of the major health issues and nutritional needs of older adults. Overview of human nutrient needs and the physiological, psychological, and sociological relationships with nutrition and aging.

HEC 6430 - Community Health and Nutrition Capstone

Lec. 3. Cr. 3.

Prerequisite: HEC 6405. Capstone project resulting in an in-depth synthesis of evidence-based knowledge in a community health and nutrition topic.

HEC 6440 - Leadership, Advocacy, and Nutrition Policy

Lec. 3. Cr. 3.

Synthesis of leadership and advocacy skills needed in health related professions. Application of knowledge of nutrition and health related issues and policies.

HEC 6600 - Family Theories and Issues Impacting Families

Lec. 3. Cr. 3.

Examination of selected family theories to provide context of understanding the family as a social system with emphasis on family-professional collaboration.

HEC 6610 - Families: Crisis Management and Intervention for Families

Lec. 3. Cr. 3.

In-depth study of crisis intervention including but not limited to, planning, implementation, and available resources. In addition, this course addresses implications of crises that professionals may face in their work with families.

HEC 6630 - Strategies and Advocacy for Families

Lec. 3. Cr. 3.

Survey of service delivery programs that serve and advocate for families.

HEC 6811 - Learning and Instructional Strategies in Family Consumer Sciences Education

Lec. 3. Cr. 3.

Responsibilities of the family and consumer sciences teacher in middle and secondary school. Selection, use and evaluation of learning experiences and material, program planning. Includes participation and observation in local schools and extension programs.

HEC 6820 - Practicum: Instructional Development and Teaching in Family and Consumer Sciences Education

Pra. 2. Cr. 2.

Prerequisite: HEC 6811 or Corequisite: HEC 6811. Observation and supervised teaching and participation in Family and Consumer Sciences Educational settings.

HEC 6841 - Occupational Family and Consumer Science / Field Experience

Lec. 3. Cr. 3.

Organization and operation of Occupational Family and Consumer Sciences Programs at middle school, high school and adult levels.

HEC 6900 - Special Topics

Lec. 3

Research in contemporary developments in Human Ecology. May be repeated. Maximum six credits.

HEC 6920 - Topics, Issues and Research in Human Ecology

Lec. 3. Cr. 3.

Advanced study of a topic or topics relevant to research and/or practice in the field of Human Ecology

HEC 6940 - Nutrition, Fitness, and Wellness

Lec. 3. Cr. 3.

Advanced principles of wellness promotion to include assessment and intervention strategies.

HEC 6945 - Advanced Sports Nutrition

Lec. 3. Cr. 3.

Prerequisite: HEC 5940 Role of health professionals in supporting health and performance for a variety of populations. Interpretation and application of evidence-based recommendations for nutrients, supplements, and fluids. Understanding scope of professional practice.

HEC 6990 - Professional Capstone Project

Lec. 3. Cr. 3.

Prerequisite: HEC 6920. Development of an integrated, culminating project that is a substantial piece of independent research or significant professional project that demonstrates the student's ability to use the knowledge gained from this program of study in the field of Human Ecology Employing strategies for the identification and research on problems in professional practice.

HEC 6995 - Sport Specific Nutrition Perspectives

Lec. 3. Cr. 3.

Specific nutrition strategies to support various types of training to include: resistance, power/sprint, middle distance/speed endurance, endurance, technical/skill, team and competition nutrition needs. Disordered eating and health complications in various athletic populations.

Instructional Leadership

INSL 4280 (5280) - Legal Aspects

Lec. 1. Cr. 1.

Special topics concerning school law and legal issues in education presented in workshop and seminar formats. Students may repeat the course for credit. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

INSL 6210 - School Finance, Facilities, and Auxiliary Services

Lec. 3. Cr. 3.

Financial issues and budgeting related to school operations, including facility development, transportation, and other auxiliary services.

INSL 6250 - School and Community Partnerships

Lec. 3. Cr. 3.

Techniques and procedures for interpreting school programs and building relationships between the school and community, and the improvement of the instructional program through community resources and involvement.

INSL 6280 - Public School Law

Lec. 3. Cr. 3.

A study of court cases, legal principles, school policies, law, and educational regulations applicable to school and classroom situations.

INSL 6400 - Effective Teaching and Supervision

Lec. 3. Cr. 3.

Principles and practices of effective teaching and supervisory techniques in the school environment enhancing student learning, growth, and development.

INSL 6420 - Professional Development in Instructional Leadership

Cr. 1-3.

The development of an individualized professional development plan designed to enhance skills as a school leader through an independent, supervised study.

INSL 6510 - School Leadership, Law, Ethics, and Diversity

Lec. 6. Cr. 6.

A study of content, topics, and competencies required for instructional leaders to engender student achievement and school success. Also, included are studies of court cases, legal principles, school policies, law, and educational regulations applicable to school classroom situations.

INSL 6520 - School-Based Management and Community Relations

Lec. 6. Cr. 6.

Financial issues and budgeting related to school operations, including facility development, transportation, and other auxiliary services. Techniques and procedures for interpreting the public schools to the community. Principles, practices, and functions of supervision in public schools. Field experience component.

INSL 6530 - Data Driven Curriculum: Development, Assessment and Evaluation

Lec. 6. Cr. 6.

Using current trends in curriculum development and advanced educational methods for K-12 education, this course is designed to assist Instructional Leadership candidates in the areas of defining objectives, planning for improvement, organization of instructional materials, curriculum evaluation, and a strong emphasis on current research and best practices.

INSL 6540 - Seminar in INSL: Effective Teaching and Supervision

Lec. 6. Cr. 6.

INSL 6550 - Internship and Culminating Experience in INSL

Lec. 6. Cr. 6.

Prerequisite: INSL 6540.

INSL 6560 - Technology for Administrators

Lec. 3. Cr. 3.

Course involves a survey of emerging and existing technologies related to school administration (operation), instruction, and planning. Emphasis is placed on effective knowledge, access, and use of available technology with ability to accurately retrieve, analyze, and disseminate school-related area.

INSL 6800 - School-Based Internship

Cr. 1-3.

School-based experiences to practice and reinforce knowledge and skills in instructional leadership.

INSL 6900 - Problems in Instructional Leadership

Cr. 3.

Research study of significant problems and issues in instructional leadership related areas.

INSL 6920 - Topics

Cr. 1-3.

An in-depth study of selected topics and case studies.

INSL 6990 - Research and Thesis

Cr. 3, 6.

INSL 7010 - Instructional Leadership

Lec. 3. Cr. 3.

A study of content, topics, and competencies required for instructional leaders to engender student achievement and school success.

INSL 7020 - School Personnel and Organizational Improvement

Lec. 3. Cr. 3.

Developing positive relationships, promoting student success, and an examination of organizational behavior, structures, and professional skills impacting on schools.

INSL 7250 - Public Relations for Schools

Lec. 3. Cr. 3.

Practical, research-based information focused on technology, reform movements, and communication techniques designed to prepare school personnel for positive public relations programs and support for schools.

INSL 7280 - Legal and Ethical Issues in Schools

Lec. 3. Cr. 3.

Legal and ethical issues impacting on instructional leadership, classroom activities, and other school practices.

INSL 7400 - School Leadership and Supervision

Lec. 3. Cr. 3.

Emphasis on teaching and leadership roles in the development of effective schools and student learning.

INSL 7430 - Seminar in Instructional Leadership

Lec. 3. Cr. 3.

A study and examination of relevant theories, problems, case studies, and issues in instructional leadership and classroom practices.

INSL 7440 - School Finance and Grantsmanship

Lec. 3. Cr. 3.

A study of revenue sources, budgeting techniques, financial management, grant development, and practices relevant to school finance.

INSL 7480 - Principalship and Leadership

Lec. 3. Cr. 3.

Concepts of school leadership, school operations, learning environment, and building level management.

INSL 7510 - School Leadership Law and Ethics

Lec. 3. Cr. 6.

A study of content, topics, and competencies required for instructional leaders to engender student achievement and school success. Also, included are legal and ethical issues impacting on instructional leadership, classroom activities, and other school practices.

INSL 7520 - Human Resources Management and Public Relations

Lec. 6. Cr. 6.

A study of revenue sources, budgeting techniques, financial management, grant development, and practices relevant to school finance. Emphasis on teaching and roles in the development of effective schools and student learning. Practical, research-based information focused on technology, reform movements, and communication techniques designed to prepare school personnel for positive public relations programs and support for schools. Field experience component.

INSL 7530 - Assessment and Evaluation: Improvement in Teaching

Lec. 6. Cr. 6.

Current trends in curriculum development; defining objectives; planning for improvement; organization of instructional materials; curriculum evaluation. Advanced study of innovations, recent trends, research findings, and evaluation relating to the improvement of teaching.

INSL 7540 - INSL Seminar: School-Based Leadership and Supervision

Lec. 6. Cr. 6.

A study and examination of relevant theories, problems, case studies, and issues in instructional leadership and classroom practices. Concepts of school leadership, school operations, learning environment, and building level management. Emphasis on Teaching and Roles in the development of effective schools and student learning.

INSL 7550 - INSL Apprenticeship and Portfolio Development

Lec. 6. Cr. 6.

Prerequisite: INSL 7540. Supervised practicums, laboratory, and case study experiences, observations, simulations, school site internships, and professional portfolio development.

INSL 7800 - Laboratory and Field Experience in Education

Cr. 3.

Supervised practicums, laboratory, and case study experiences, observations, simulations, and school site internships.

INSL 7900 - Reading and Research in Instructional Leadership

Cr. 3.

Reading and advanced research study in major concentration.

INSL 7910 - Advanced Research Project in Instructional Leadership

Cr. 3.

Supervised research study or approved project in major area of concentration.

Journalism

JOUR 4360 (5360) - Magazine Production and Design

Lec. 3. Cr. 3.

Current trends in magazine production and design. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

JOUR 4460 (5460) - Public Relations--Cases and Practices

Lec. 3. Cr. 3.

Prerequisite: JOUR 3460. Practical aspects of public relations emphasized. Case studies considered. Builds on knowledge and expertise acquired in JOUR 3460. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

JOUR 4500 (5500) - Advanced Multimedia Storytelling

Lec. 3. Credit 3.

Prerequisite: JOUR 2200, JOUR 2220, a "C" or higher in JOUR 3500 or consent of instructor. A fast-paced course in content creation for the web and broadcast. May include experience on student media outlets. Associated Press style will be used.

JOUR 4820 (5820) - Advanced Reporting

Lec. 3. Cr. 3.

Prerequisite: JOUR 3220. Writing and reporting for the commercial media. Students will serve as reporters for the campus newspaper. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

JOUR 4830 (5830) - Feature Writing

Cross-listing: PC 4830 (5830)

Lec. 3. Cr. 3.

Prerequisite: JOUR 2220. Recommended: JOUR 4820 (5820). An introductory course in the writing and marketing of feature stories, commentaries and articles for the print and digital media. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

JOUR 4840 (5840) - Special Problems

Cr. 3.

Prerequisite: Senior standing or consent of instructor. Independent work in mass media research and report writing, or internship programs in print or electronic media, public relations, and other areas. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

JOUR 4850 (5850) - Internship

Cr. 3,6,9,12.

Part-time or full-time employment in a business, industrial, or institutional communications setting, related to student academic and career goals. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

JOUR 4930 (5930) - Advanced Copy Editing

Lec. 2. Lab. 2. Cr. 3.

Prerequisite: JOUR 3220. Additional training in editing copy with emphasis on laboratory work on the university student newspaper. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

JOUR 4940 (5940) - Technical Editing

Lec. 3. Cr. 3.

Prerequisite: ENGL 4970 (5970)/PC 4970 (5970). Principles and practices of technical editing. (Same as PC 4940 (5940)). Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

JOUR 5030 - Field Experience in Event Management and Promotion

Lec. 3 Cr. 3

Prerequisite: Consent of instructor.

This course will provide students with the opportunity to implement skills learned to manage and promote an actual event, either in pairs or small groups.

JOUR 5710 - Literary Journalism

Lec. 3. Cr. 3.

Prerequisite: JOUR 2200 and 2220. Instruction in the form of the literary essay—both short and book length—through both reading and writing literary essays. Course may be repeated for credit provided content is different.

JOUR 5860-69 (6860-69) - Special Topics

Lec. 3. Cr. 3.

Seminar or lecture course on a selected topic, issue, or interest area in journalism not covered in existing courses. Course may be repeated for credit under a different subtitle, up to nine hours of credit.

JOUR 5870 - Independent Study

Cr. 1, 2, 3

Prerequisite: Senior standing or consent of instructor and JOUR 2200. Independent study of an approved topic (area) within mass media research and/or writing related to student academic and career goals under the supervision of a member of the journalism faculty. Up to nine credit hours may be earned by independent study.

JOUR 5871 - Independent Study

Cr. 1, 2, 3

Prerequisite: Senior standing or consent of instructor and JOUR 2200. Independent study of an approved topic (area) within mass media research and/or writing related to student academic and career goals under the supervision of a member of the journalism faculty. Up to nine credit hours may be earned by independent study.

JOUR 5872 - Independent Study

Cr. 1, 2, 3

Prerequisite: Senior standing or consent of instructor and JOUR 2200. Independent study of an approved topic (area) within mass media research and/or writing related to student academic and career goals under the supervision of a member of the journalism faculty. Up to nine credit hours may be earned by independent study.

JOUR 6450 - Public Relations Management

Cr. 3.

This program is meant to introduce many of the key aspects of public relations management through the readings of and understanding of public relations principles and case studies.

JOUR 6998 - Professional Project

Cross-listing: PRST 6998 COMM 6998

Lec. 3. Credit 3.

The Professional Project is the last requirement for the MPS Degree, serving as the integrative culmination of the program of study. It should be a substantial piece of independent research or a significant professional project that is logically consistent with the theme and content of the program of study. Student's work should demonstrate familiarity with and understanding of a body of professional literature related to a specific topic. The Project should grow out of the program of study and should demonstrate the student's ability to use the knowledge gained from this program of study.

Leadership

LDSP 6000 - Current Issues and Cases in Leadership

Cr. 3.

Based on a global and cross-discipline perspective, this course provides a study of the current trends and practices in public and private sector leadership. Students will read and discuss current news, research, and case studies and will be required to complete independent and collaborative projects. Instruction will be provided on where to track trends in leadership and how to use the case method. Specific topics may vary depending upon the current trends but will generally include personal mastery and leadership development, leading organizations into the future, values-based leadership and corporate citizenship, collaborative leadership, global leadership and diversity, stakeholder relations, knowledge management, a comparative study of the roles of leaders in business, public and nonprofit (civil society) organizations, leadership at the grassroots and board levels, the impact of technology on leadership.

Library Science

LSCI 4020 (5020) - Storytelling and Traditional Literature

Cross-listing: READ 4020 (5020)

Lec. 3. Cr. 3.

Storytelling techniques and literature presentation through storytelling. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

LSCI 4400 (5400) - Audio-Visual Aids to Teaching

Lec. 2. Cr. 2.

Prerequisite: EDPY 2200. Survey of educational media available to educators with emphasis given to effective

utilization. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

LSCI 4530 (5530) - Books and Related Materials for Infants and Toddlers

Lec. 1. Cr. 1.

Survey of developmentally appropriate books and materials for infants and toddlers. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

LSCI 4540 (5540) - Multiethnic Literature for Infants, Toddlers, and Preschoolers

Cross-listing: READ 4540 (5540)

Lec. 1. Cr. 1.

Introduction to preschool trade books and related materials reflecting an understanding of multiethnicity. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

LSCI 4550 (5550) - Multiethnic Literature for Children

Cross-listing: READ 4550 (5550)

Lec. 1. Cr. 1.

Introduction to children's trade books and related materials reflecting an understanding of multiethnicity. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

LSCI 4560 (5560) - Multiethnic Literature for Adolescents and Adults

Cross-listing: READ 4560 (5560)

Lec. 1. Cr. 1.

Introduction to adolescent and adult trade books and related materials reflecting an understanding of multiethnicity. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

LSCI 4570 (5570) - Young Adult Literature

Cross-listing: READ 4570 (5570)

Lec. 3. Cr. 3.

A survey of young adult literature appropriate for middle and high school students with a focus on contemporary and diverse works. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

LSCI 6010 - Classification and Cataloging of Media and Materials

Lec. 3. Cr. 3.

Procedures for selecting, organizing, classifying, and cataloging school library materials. Collection development of print, digital, and other resources for the school library.

LSCI 6550 - Contemporary Children's Literature

Cross-listing: READ 6550

Lec. 3. Cr. 3.

Through the lens of the psychology of reading, a survey of contemporary and diverse children's literature and the authors and illustrators who create the books.

LSCI 6600 - Literature Across the Curriculum

Cross-listing: READ 6600

Lec. 3. Cr. 3.

Uses of literature in English/language arts, science, social studies, math, and other curricular areas. Equal emphasis on enhancement of content areas and integration across content areas.

LSCI 6800 - Library Practicum

Cr. 3.

Supervised field experience for students in library science in two (2) or more school libraries at various grade levels. 100 hours of experience required. A minimum grade of B is required to meet requirements for licensure candidates.

LSCI 7000 - Information Literacy Tools and Services

Lec. 3. Cr. 3.

A thorough analysis of the AASL National School Library Standards and how the school librarian uses them to support the learning community and its stakeholders.

LSCI 7030 - Administration of the School Library

Lec. 3. Cr. 3.

An examination of the roles the school librarian in leadership, collaboration, advocacy, professional networking, and professional learning through the management of the school library.

LSCI 7040 - Technology Engagement and Support for Libraries

Lec. 3. Cr. 3.

Active engagement with emerging technologies and makerspaces appropriate for modern school libraries and their support of learning communities.

LSCI 7570 - Contemporary Young Adult Literature

Lec. 3 Cr. 3

Engagement and research into contemporary young adult literature, issues of diversity and inclusion, and incorporating YAL into the literacy goals of the learning community.

LSCI 7800 - Library Practicum

Cr. 3

Supervised field experience for students in library science in two (2) or more school libraries at various grade levels. 100 hours of experience required. A minimum grade of B is required to meet requirements for licensure candidates.

Linguistics

LING 4511 (5511) - Introduction to Descriptive Linguistics

Cross-listing: ENGL 4511 (5511)

Lec. 3. Cr. 3.

Introduction to descriptive analysis of language: phonology, morphology, lexicon, and syntax. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

LING 4521 (5521) - History of the English Language

Cross-listing: ENGL 4521 (5521)

Lec. 3. Cr. 3.

History of English from its origins to the present, emphasis upon historical development of English sounds, word

structure, and syntax. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

LING 4531 (5531) - Grammar and Language

Cross-listing: ENGL 4531 (5531)

Lec. 3. Cr. 3.

Grammatical structure of English in relation to dialect and register with some emphasis on historical and potential changes in grammar. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

LING 4541 (5541) - Topics in Linguistics/Language

Cross-listing: ENGL 4541 (5541)

Lec. 3. Cr. 3.

Examination of specific aspects of language and/or linguistic study, such as Old and Middle English, the language of dialect literature, or American English dialects. Course may be repeated, provided the content is different each time. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

LING 4561 (5561) - American English

Lec. 3 Cr. 3.

This class will examine American English from multiple cultural and linguistic angles and allow the students to develop their own understanding of how the language around them shapes their lives.

Literacy

EDUL 7000 - Seminar in Reading and Language Arts

Lec. 3. Cr. 3.

Prerequisite: Admission to Doctoral Program. Discussion of current issues and materials in reading and language arts.

EDUL 7100 - Literacy History, Theory, and Policy

Lec. 3. Cr. 3.

Prerequisite: Admission to doctoral program. Exploration of the history and theory related to reading and writing instruction. Policies influencing literacy instruction, past and present, will also be examined.

EDUL 7200 - Equity Literacy

Lec. 3. Cr. 3.

Prerequisite: Admission to doctoral program. Promotes understanding of deficit thinking in education as it relates to students who are disadvantaged by poverty and guides students to develop language, skills, and competencies for countering deficit thinking in order to promote equity in education.

EDUL 7300 - Multiliteracies

Lec. 3. Cr. 3.

Prerequisite: Admission to doctoral program. Explores multiple and new literacies, moving beyond traditional reading and writing to examine the multimodal ways of meaning making and communicating and their place in pedagogy and practice.

EDUL 7400 - Literacies of Culturally & Linguistically Diverse Populations

Lec. 3. Cr. 3.

Prerequisite: Admission to doctoral program. Literacies of culturally and linguistically diverse groups through a critical lens.

EDUL 7500 - Linguistic Perceptions

Lec. 3. Cr. 3.

Prerequisite: Admission to doctoral program. Explores perceptions of the world through the language that we use and belief systems we create.

EDUL 7600 - The Literacy Professional

Lec. 3. Cr. 3.

Prerequisite: Admission to doctoral program. Exploring the various roles of the literacy professional. Preparing for grant and article submission.

EDUL 7700 - Theory, Methodology, & Trends in Literacy Research

Lec. 3. Cr. 3.

Prerequisite: Admission to doctoral program. Examines major theories and methodologies in literacy research and explores new trends in the field.

EDUL 7800 - Professional Development in the Educational Setting

Lec. 3. Cr. 3.

Prerequisite: Admission to Doctoral Program. Supervised practicums, observation, simulation, internships, and externships in education.

EDUL 7900 - Community Literacy

Lec. 3. Cr. 3.

Prerequisite: Admission to doctoral program. Working to explore and participate in various literacy initiatives within the community.

READ 6200 - Foundations of Literacy

Lec. 6. Cr. 6.

Prerequisite: Full admission to the Teacher Education Program. This course is an integration of concepts fundamental to the development, instruction, and assessment of literacy in the elementary grades. It integrates theory, children's literature, language development and communication skills, language arts, and the assessment and selection of appropriate instructional strategies based upon student need. Practicum embedded into course. A minimum grade of B is required to meet requirements for licensure candidates.

READ 6700 - Diversity and Equity in Literacy

Lec. 3. Cr. 3.

Framed within a culturally responsive instruction model, the focus of this course is on diversity and equity among learners. It will address instructional needs of diverse linguistic speakers of English as well as those of English

Language Learners. Additionally, it will examine pedagogy and methodology, including the use of children's and young adult literature, for students with wide-ranging learning styles and needs and from various socio-economic backgrounds.

READ 7500 - Leadership in Literacy Education

Lec. 3. Cr. 3.

Prerequisite: Full admission to the Teacher Education Program; READ 6310, READ 6340, and READ 6350. This course explores the roles of the literacy specialist and coach, and, in particular, their positions as school leaders in the field of literacy. Leadership skills related to literacy program design, evaluation, and supervision are emphasized as well as a focus on advocacy, reflection, research, policy, and practice. Practicum embedded into course. A minimum grade of B is required to meet requirements for licensure candidates.

READ 7800 - Practicum Experiences in Literacy

Cr. 3.

Prerequisite: Full admission to the Teacher Education Program; READ 6340 and READ 6350. Practical field experience in student's major area of emphasis. A minimum grade of B is required to meet requirements for licensure candidates.

Manufacturing and Engineering Technology

MET 4060 (5060) - CNC Concepts, Advanced Techniques and Applications

Lec. 2. Lab 2. Cr. 3.

Prerequisite: MET 3060. An in-depth study of programming systems, techniques and applications. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MET 4200 (5200) - Industrial Electronics

Lec. 2. Lab 2. Cr. 3.

Prerequisite: MET 3200. The fundamentals of process control, transducers, signal processing, feedback loops, activators, and analog and digital controllers. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MET 4210 (5210) - Programmable Logic Controllers and Process Control

Lec. 2. Lab 2. Cr. 3.

Prerequisite: MET 4200. Programmable logic controllers (PLC's) and automated process control; design and implementation of an automatic controlled industrial process. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MET 4220 (5220) - Industrial Automation and Robotics

Lec. 2. Lab 2. Cr. 3.

Prerequisite: MET 3060. Studies in the theory and application of industrial automation relating to manufacturing. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MET 4250 (5250) - Applied Mechatronics

Cr. 3.

Prerequisite: MET 3250 or Consent of Instructor. Introduction to mechatronics systems; modeling of mixed mechatronics systems; microcontroller programming and interfacing; theory, selection, and implementation of sensors and actuators commonly used in mechatronics system; control architectures and case studies in mechatronics system; Introduction of robotics; robot programming; machine vision. Students taking 5000-level need a special project and a paper.

MET 4300 (5300) - Advanced CAD Techniques

Lec. 2. Lab 2. Cr. 3.

Prerequisite: MET 3301. An in-depth course using CAD as a design tool that examines multiview drawings, layers, dimensioning, blocks, and sectional views. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MET 4310 (5310) - Plant Layout and Materials Handling

Lec. 2. Lab 2. Cr. 3.

Prerequisite: MET 3301, MET 3710. An analysis of materials movement within industrial organizations. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MET 4400 (5400) - Geometric Dimensioning and Tolerancing

Lec. 2. Lab 2. Cr. 3.

Prerequisite: ENGR 1110, MET 3301. This course will cover the geometric conformance and tolerancing theory and application pertaining to ANSI/ASME Y14.5M-1994 via computer graphics and other electronic data systems for design, manufacture, verification, and similar processes. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MET 4430 (5430) - Industrial Supervision

Lec. 3. Cr. 3.

Prerequisite: Senior. Supervisory responsibilities in an organization and procedures for meeting these responsibilities. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MET 4450 (5450) - Additive Manufacturing

Lec. 2. Lab 2. Cr. 3.

Prerequisite: MET 3301. This course prepares students to create a rapid prototyping file from a computer aided design file, determine the prototype for the model or part, and create a production plan for the part. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MET 4500 (5500) - Tool Design

Lec. 2. Lab 2. Cr. 3.

Prerequisite: MET 2063, MET 3301. This course covers and integrated treatment of tool design, specification and application by the use of standard tooling data. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MET 4550 (5550) - Maintenance, Replacement and Reliability Engineering

Lec. 3. Cr. 3.

Prerequisite: Senior or graduate standing in engineering, engineering technology or business. Reliability networks, failure mode and effect analysis, apportionment, availability, maintainability, fault trees and human reliability. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MET 4600 (5600) - Product Design and Development

Lec. 3. Cr. 3.

Prerequisite: Senior or graduate standing in engineering, engineering technology or business. This is a project-based course that covers modern tools and methods for product design and development. Topics include identifying customer needs, concept generation, product architecture, industrial design, and design-for-manufacturing. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MET 4650 (5650) - Lean Six Sigma Manufacturing

Lec. 3. Cr. 3.

Prerequisite: Senior or graduate standing in engineering, engineering technology or business. Review of current engineering and technology techniques relevant to manufacturing, service, quality and productivity. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MET 4990 (5990) - Special Problems

Lec. 2. Lab. 2. Cr. 3.

Prerequisite: Senior Standing. Investigations of industrial topics in the students area of interest. May be taken under different subtitles to a maximum of six credits. A particular topic may be offered at most twice under the MET 4990 number. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MET 6010 - Environmental Policy

Lec. 3. Cr. 3.

Prerequisite: Admission to graduate program or consent of instructor. This course provides an overview of environmental policy, policy process, behavior of interest groups and political parties and the actions of policymakers. In addition, the course will examine significant environmental issues such as pollution control, climate change, conservation and biodiversity.

MET 6100 - Manufacturing Strategy for Sustainability

Lec. 2. Lab 2. Cr. 3.

Prerequisite: Consent of instructor. This course examines the concept of "Manufacturing Strategy for Sustainability" using green materials, methods and technologies that are energy efficient, sustainable and friendly to the environment. It will cover topics on carbon footprint management, sustainable manufacturing process design, and life-cycle assessment.

MET 6200 - Energy Management Principles

Lec. 3. Cr. 3.

Prerequisite: Consent of instructor. Principles and technical details of the efficient and effective use of energy to maximize profits, minimize cost and enhance competitive positions.

MET 6300 - Alternative Energy Production

Lec. 3. Cr. 3.

Prerequisite: Consent of instructor.

Principles and technical details of various renewable energy technologies (solar, biomass, wind, hydroelectric, geothermal, tidal and wave energy) for the sustainable future. Process design, energy analysis, engineering economics and environmental assessment of renewable energy systems.

MET 6990 - Internship

Cr. 3.

Full-time or part-time, on-the-job work performed at a sponsoring entity while under the supervision of an approved advisor in an area related to manufacturing sustainability. Written objectives, a written internship analysis, and a public presentation are required.

Marine Biology

MBIO 4030 (5030) - Marine Invertebrate Zoology

Summer. Cr. 6.

Prerequisite: 16 semester hours of biology. Structure, classification, phylogeny, and function in Protozoa through the Lophophorata. Observation of their ecology and behavior. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MBIO 4040 (5040) - Parasites of Marine Animals

Summer. Cr. 6.

Prerequisite: BIOL 3110, or 3130, or consent of instructor. Morphology, taxonomy, life histories, and host-parasite relationships. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MBIO 4050 (5050) - Marine Ecology

Summer. Cr. 5.

Prerequisite: 16 semester hours of biology, including General Zoology, General Botany, and Invertebrate Zoology. Relationship of marine organisms to their environment. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MBIO 4060 (5060) - Fauna and Faunistic Ecology of Tidal Marshes

Summer. Cr. 4.

Prerequisite: 16 semester hours of biology and Junior standing, or consent of instructor. Taxonomy, distribution, trophic relationships, reproductive strategies and adaptations. emphasis on northern Gulf marshes. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MBIO 4070 (5070) - Marine Aquaculture

Summer. Cr. 6.

Prerequisite: 16 semester hours of zoology, including invertebrate and vertebrate zoology of ichthyology. Technology,

principles, and problems of aquaculture. Emphasis of marine species. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MBIO 4080 (5080) - Marine Ichthyology

Summer. Cr. 6.

Prerequisite: 12 semester hours of biology and junior standing. Marine Chordata, including lower groups and the mammals and birds. Emphasis on fishes. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MBIO 4090 (5090) - Marine Microbiology

Summer. Cr. 5.

Prerequisite: BIOL 3110 or consent of instructor. Sampling procedures, taxonomy of marine bacteria, mineralization, microbial, fouling, pollution, and diseases of marine animals. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MBIO 4100 (5100) - Marine Fisheries Management

Summer. Cr. 4.

Prerequisite: Consent of instructor. Overview of practical marine fishery management program. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MBIO 4200 (5200) - Marine Phycology

Summer. Cr. 4.

Prerequisite: 8 semester hours of biology, including introductory botany, or consent of instructor. Survey of the principal groups of marine algae and maritime flowering plants. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MBIO 4210 (5210) - Coastal Vegetation

Summer. Cr. 3.

Prerequisite: 10 semester hours of biology, including general biology. Aspects of coastal vegetation. Emphasis on local examples. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MBIO 4220 (5220) - Salt Marsh Plant Ecology

Summer. Cr. 4.

Prerequisite: General botany, plant taxonomy, plant physiology, general ecology, or consent of instructor. Identification, composition, structure, distribution, primary productivity, ecology, and development. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MBIO 4300 (5300) - Comparative Histology of Marine Organisms

Cr. 1-6.

Prerequisite: Consent of instructor. Processing tissues using light, transmission electron, and scanning electron microscopy. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MBIO 4410 (5410) - Marine Chemistry

Summer. Cr. 6.

Prerequisite: 16 semester hours of chemistry, 3-6 semester hours of biology and geology or consent of instructor. Chemical aspects of oceans and interactions of chemistry, biology, and geology in marine environments. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MBIO 4440 (5440) - Behavior and Neurobiology of Marine Animals

Summer. Cr. 4.

Prerequisite: 16 semester hours of zoology and/or psychology, or consent of instructor. Behavior, neuroanatomy, and neurophysiology. Emphasis on neural mechanisms underlying behavior. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MBIO 4570 (5570) - Marine Science for Teachers

Summer. Cr. 3.

Prerequisite: Biology background or consent of instructor. Introduction to marine science. For public school teachers. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MBIO 4580 (5580) - Marine Science for Elementary Teachers

Summer. Cr. 3.

Prerequisite: 6 semester hours of biology. Materials and methods in teaching marine science to elementary students. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MBIO 4900 (5900) - Special Problems in Marine Science

Cr. 1-6.

Prerequisite: To be set by problem director. Research oriented problems reported in writing. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MBIO 4910 (5910) - Special Topics in Marine Science

Cr. 1-6.

Prerequisite: To be set by topics advisor. Special study in a field topic approved by the GCRL topics advisor and the student's institutional advisor. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MBIO 5990 - Coastal Ecology for Teachers

Summer. Cr. 4.

Designed to provide teachers with a background in coastal ecology.

MBIO 6040 - Early Life History of Marine Fishes

Summer. Cr. 4.

Prerequisite: Ichthyology, Fisheries, Biology, Ecology and/or consent of instructor. Reproductive strategies and early developmental processes.

Marketing

MKT 5200 - Basic Marketing

Lec. 3. Cr. 3.

The structure of markets, techniques, and tools available to the marketing manager; motivations of buyers.

MKT 6100 - Strategic Marketing

Lec. 3. Cr. 3.

Strategic marketing issues and opportunities that impact both the marketing process and marketing program. Decisions will also consider environmental variables as well as the internal elements of an organization.

MKT 6500 - Advanced Marketing Analysis

Lec. 3. Cr. 3.

Prerequisite: MKT 6100 . A case course including an intensive study of analysis of marketing information for marketing decisions.

MKT 6510 - Services Marketing

Cr. 3.

This course will focus on service organizations and services marketing issues to make students aware of the unique challenges involved in marketing and managing organizations in sectors such as finance, health care, entertainment, hospitality, professional services, retailing, education and transportation. Specific topics will include learning and developing strategies for real life business cases to close potential service gaps such as customer, knowledge, service development/design, performance, and communication gaps that have negative impact on service performance and quality perceptions of customers about the service offering.

MKT 6630 - Entrepreneurship and Small Business Management

Lec. 3. Cr. 3.

A case course concentrating on the salient issues and management decisions covering entrepreneurship, the formation and management of new business ventures, and the complex managerial process of small business ownership.

MKT 6900 - Special Topics

Lec. 3. Cr. 3.

A case course dealing with current topics in business.

MKT 6930 - International Marketing

Lec. 3. Cr. 3.

International markets, instruments, and global marketing strategies. This course will focus on the study of consumer behavior and buying cultures in all major regions of the world, and it relates this information to the creation of international marketing plans and strategies.

Mathematics

MATH 4010 (5010) - Modern Algebra I

Lec. 3. Cr. 3.

Prerequisite: Prerequisite: C or better in MATH 2010 or equivalent and C or better in MATH 3400. Groups and subgroups including cyclic, abelian, finite, permutation groups, group homomorphisms, cosets and Lagrange's Theorem, normal subgroups and factor groups. Rings including integral domains, unique factorization domains and Euclidean domains, ideals and factor rings, ring homomorphisms, fields and their extensions, geometric constructions. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MATH 4020 (5020) - Modern Algebra II

Lec. 3 Cr. 3.

Prerequisite: Prerequisite: C or better in MATH 4010 (5010) . Groups and subgroups including cyclic, abelian, finite, permutation groups, group homomorphisms, cosets and Lagrange's Theorem, normal subgroups and factor groups. Rings including integral domains, unique factorization domains and Euclidean domains, ideals and factor rings, ring homomorphisms, fields and their extensions, geometric constructions. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MATH 4050 (5050) - Number Theory

Lec. 3. Cr. 3.

Prerequisite: Consent of instructor. Properties of integers, division algorithms, prime numbers, diophantine equations, congruences. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MATH 4060 (5060) - Topics in Cryptography

Lec. 3. Credit 3.

Prerequisite: C or better in MATH 2010 and C or better in either MATH 3400 or CSC 2700. Fundamental concepts of cryptography presented with mathematical background (including groups, fields, elements of number theory, probability and statistics). Special attention will be given to the RSA algorithm, Elliptic Curve Cryptography, the ElGamal public key cryptosystem, Diffie-Hellman key exchange and pseudo random number generators.

MATH 4110 (5110) - Advanced Calculus I

Lec. 3. Rec. 1. Cr. 3.

Prerequisite: MATH 4110 (5110): C or better in MATH 3400 or consent of instructor; MATH 4120 (5120): C or better in MATH 4110 (5110). Rigorous treatment of functions of one and several variables, improper integrals, sequences, infinite series, uniform convergence and applications. Students are expected to improve their ability to work in an abstract setting using precise definitions and formal proofs and to present their work in class. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MATH 4120 (5120) - Advanced Calculus II

Lec. 3. Rec. 1. Cr. 3.

Prerequisite: MATH 4110 (5110): C or better in MATH 3400 or consent of instructor; MATH 4120 (5120): C or better in MATH 4110 (5110). Rigorous treatment of functions of one and several variables, improper integrals, sequences, infinite series, uniform convergence and applications. Students are expected to improve their ability to work in an abstract setting using precise definitions and formal proofs and to present their work in class. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MATH 4210 (5210) - Numerical Analysis I

Lec. 3. Cr. 3.

Prerequisite: MATH 4210 (5210): C or better in MATH 1920 (or consent of instructor for MATH 5210); MATH 4220 (5220): C or better in MATH 2120 or consent of instructor. Iterative methods for nonlinear equations, computational error analysis, convergence of iterative techniques, interpolation, numerical differentiation and integration, approximate solutions of initial-value problems, boundary-value problems, and nonlinear systems, direct and iterative methods for linear systems. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MATH 4220 (5220) - Numerical Analysis II

Lec. 3. Cr. 3.

Prerequisite: MATH 4210 (5210): C or better in MATH 1920 (or consent of instructor for MATH 4210 (5210)); MATH 4220 (5220): C or better in MATH 2120 or consent of instructor. Iterative methods for nonlinear equations, computational error analysis, convergence of iterative techniques, interpolation, numerical differentiation and integration, approximate solutions of initial-value problems, boundary-value problems, and nonlinear systems, direct and iterative methods for linear systems. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MATH 4250 (5250) - Advanced Ordinary Differential Equations I

Lec. 3. Cr. 3.

Prerequisite: MATH 4250 (5250): C or better in MATH 2110 and MATH 2120 (or consent of instructor for MATH 5250); MATH 4260 (5260): C or better in MATH 4250 (5250). Systems of ordinary differential equations, matrix methods, approximate solutions, stability theory, basic theory of nonlinear equations and differential systems, trajectories, phase space stability, construction of Liapunov functions. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MATH 4260 (5260) - Advanced Ordinary Differential Equations II

Lec. 3. Cr. 3.

Prerequisite: MATH 4250 (5250): C or better in MATH 2110 and MATH 2120 (or consent of instructor for MATH 4250 (5250)); MATH 4260 (5260): C or better in MATH 4250 (5250). Systems of ordinary differential equations, matrix methods, approximate solutions, stability theory, basic theory of nonlinear equations and differential systems, trajectories, phase space stability, construction of Liapunov functions. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MATH 4310 (5310) - Introduction to Topology I

Lec. 3. Cr. 3.

Prerequisite: MATH 4310 (5310): C or better in MATH 3400 (or consent of instructor for MATH 5310); MATH 4320 (5320): C or better in MATH 4310 (5310). Topological spaces, continuity, connectedness, compactness, separation axioms, function spaces, and fundamental groups. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MATH 4320 (5320) - Introduction to Topology II

Lec. 3. Cr. 3.

Prerequisite: MATH 4310 (5310): C or better in MATH 3400 (or consent of instructor for MATH 4310 (5310)); MATH 4320 (5320): C or better in MATH 4310 (5310). Topological spaces, continuity, connectedness, compactness, separation axioms, function spaces, and fundamental groups. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MATH 4350 (5350) - Introductory Combinatorics

Lec. 3. Cr. 3.

Prerequisite: C or better in MATH 3400 or consent of instructor. Topics to be covered include permutations, combinations, multisets, partitions, recurrence relations, generating functions, and the principle of inclusion-exclusion. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MATH 4360 (5360) - Graph Theory

Lec. 3. Cr. 3.

Prerequisite: C or better in MATH 3400 or consent of instructor. Fundamental concepts of undirected and directed graphs, trees, connectivity, traversability, planarity, colorability, network flows, and matching theory. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MATH 4410 (5410) - Differential Geometry

Lec. 3. Cr. 3.

Prerequisite: C or better in MATH 2010, 2110, and 3400 (or consent of instructor for MATH 5410). Geometry of curves and surfaces in three dimensional space. Calculus on surfaces, curvature and Riemannian geometry. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MATH 4470 (5470) - Probability and Statistics I

Lec. 3. Cr. 3.

Prerequisite: C or better in MATH 2110 or consent of instructor. Mathematical foundations of elementary statistical methods, application and theory, probability in discrete and continuous distribution, correlation and regression, sampling distributions, significance tests. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MATH 4480 (5480) - Probability and Statistics II

Lec. 3. Cr. 3.

Prerequisite: C or better in MATH 2110 or consent of instructor. Mathematical foundations of elementary statistical methods, application and theory, probability in discrete and continuous distribution, correlation and regression, sampling distributions, significance tests. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MATH 4510 (5510) - Advanced Mathematics for Engineers

Lec. 3. Cr. 3.

Prerequisite: C or better in MATH 2120 and MATH 2120. Fourier series, Sturm-Liouville problems, orthogonal functions, Legendre polynomials, Bessel functions, separable partial differential equations (e.g., heat, wave, and Laplace equations), and other topics. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MATH 4530 (5530) - Linear Algebra I

Lec. 3. Cr. 3.

Prerequisite: MATH 4530 (5530): C or better in MATH 2010 and MATH 3400; MATH 4540 (5540): C or better in MATH 4530 (5530). A theoretical study of vector spaces, bases and dimension, subspaces, linear transformations,

dual spaces, eigenvalues and eigenvectors, inner product spaces, spectral theory, duality, quadratic and bilinear forms. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MATH 4540 (5540) - Linear Algebra II

Lec. 3. Cr. 3.

Prerequisite: MATH 4530 (5530): C or better in MATH 2010 and MATH 3400; MATH 4540 (5540): C or better in MATH 4530 (5530). A theoretical study of vector spaces, bases and dimension, subspaces, linear transformations, dual spaces, eigenvalues and eigenvectors, inner product spaces, spectral theory, duality, quadratic and bilinear forms. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MATH 4550 (5550) - Mathematics of Investment I

Lec. 3. Credit 3.

Prerequisite: C or better in MATH 1920 or consent of instructor Topics include examination of annuities, loans, bonds and other securities, portfolio, immunization, interest rate swaps.

MATH 4560 (5560) - Mathematics of Investment II

Cross-listing: C or better in both MATH 4550 (5550) and MATH 4470 (5470), or consent of instructor.

Lec. 3. Credit 3.

Topics include derivative securities, mathematical models of financial risk management, and corporate finance.

MATH 4610 (5610) - History of Mathematics I

Lec. 3. Cr. 3.

Prerequisite: C or better in MATH 3400 (or consent of instructor for MATH 5610). The development of mathematics and its relation to the development of civilization prior to the beginnings of calculus. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MATH 4620 (5620) - History of Mathematics II

Lec. 3. Cr. 3.

Prerequisite: C or better in MATH 3400 (or consent of instructor for MATH 5620). History of mathematics from the beginnings of calculus through the modern times. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MATH 4710 (5710) - Vector Analysis

Lec. 3. Cr. 3.

Prerequisite: C or better in MATH 2110. The algebra and the differential and integral calculus of vectors; applications to geometry and mechanics. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MATH 4750 (5750) - Category Theory of Sets

Lec. 3. Cr. 3.

Prerequisite: C or better in MATH 3400 (or consent of instructor for MATH 5750). Abstract sets and mappings, categories, sums, universal property, monomorphisms and parts, finite inverse limits, colimits, epimorphisms, the Axiom of Choice, mapping sets and exponentials, covariant and contravariant functoriality of function spaces,

Cantor's diagonal argument, power sets, variable sets, models of additional variation, selected applications. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MATH 4850 (5850) - Computational Algebraic Geometry I

Lec. 3. Cr. 3.

Prerequisite: C or better in MATH 2010, and C or better in MATH 3400 or equivalent; or consent of instructor.

Additional recommended prerequisite: MATH 3510 or any other 4000/5000 level mathematics course in which proofs are required. Affine varieties and polynomial ideals. Groebner bases, elimination theory, Hilbert's Nullstellensatz, Zariski closure, decomposition into irreducible varieties.

MATH 4860 (5860) - Computational Algebraic Geometry II

Lec. 3. Cr. 3.

Prerequisite: C or better in MATH 4850 (5850). Polynomial and rational functions on a variety, projective varieties, the dimension of a variety, selected applications in robotics, automatic theorem proving, and invariant theory of finite groups.

MATH 4910 (5910) - Directed Readings

Cr. 1-3.

Prerequisite: Consent of instructor. These courses provide an opportunity for individual reading and study under the supervision of a qualified staff member. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MATH 4920 (5920) - Directed Readings

Cr. 1-3.

Prerequisite: Consent of instructor. These courses provide an opportunity for individual reading and study under the supervision of a qualified staff member. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MATH 4950 (5950) - Topics in Mathematics

Lec. 3. Cr. 3.

Prerequisite: Consent of instructor. A formal course in any area where there is no other course offering. May be taken more than once, provided that the topic is different. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MATH 6001 - Communicating Mathematics I

Lab. 2. Credit 1.

This course provides practical training in the teaching of mathematics at the pre-calculus level and the uses of technology in the mathematics classroom.

MATH 6002 - Communicating Mathematics II

Lab 2. Credit 1.

This course provides practical training in typesetting mathematics and the written and oral presentation of mathematical papers.

MATH 6010 - Functional Analysis I

Lec. 3. Cr. 3.

Prerequisite: C or better in MATH 4120 (5120) or consent of instructor. Metric spaces, normed and Banach spaces, inner product and Hilbert spaces. Fundamental theorems for normed and Banach spaces and their applications. Linear operators on normed and Hilbert spaces.

MATH 6020 - Functional Analysis II

Lec. 3. Cr. 3.

Prerequisite: C or better in MATH 6010. Metric spaces, normed and Banach spaces, inner product and Hilbert spaces. Fundamental theorems for normed and Banach spaces and their applications. Linear operators on normed and Hilbert spaces.

MATH 6070 - Applied Linear Statistical Methods I

Lec. 3. Cr. 3.

Prerequisite: Consent of instructor. Regression analysis in the context of classical linear, nonlinear, generalized linear, and time series models.

MATH 6080 - Applied Linear Statistical Methods II

Lec. 3. Cr. 3.

Prerequisite: B or better in MATH 6070 or consent of instructor. Regression analysis in the context of classical linear, nonlinear, generalized linear, and time series models.

MATH 6110 - Abstract Algebra I

Lec. 3. Cr. 3.

Prerequisite: C or better in MATH 4010 (5010) or consent of instructor. An extensive treatment of groups, semigroups, integral domains, rings and ideals, fields, and Galois fields.

MATH 6120 - Abstract Algebra II

Lec. 3. Cr. 3.

Prerequisite: C or better in MATH 4020 (5020) and C or better in MATH 6110, or consent of instructor. An extensive treatment of groups, semigroups, integral domains, rings and ideals, fields, and Galois fields.

MATH 6150 - Mathematical Modeling

Lec. 3. Cr. 3.

Prerequisite: Consent of instructor. Applications of mathematics to real world problems with emphasis on problem definition, research, solution, and written report presentation.

MATH 6170 - Experimental Design I

Lec. 3. Cr. 3.

Prerequisite: Consent of instructor. Introduction to basic concepts of experimental design, fundamental assumptions in analysis of variance, multiple comparison tests, complete randomized design, general linear model approach to ANOVA, various experimental designs, incomplete block designs, factorial experiments, fractional factorial experiments, response surface methods, repeated measure designs.

MATH 6180 - Experimental Design II

Lec. 3. Cr. 3.

Prerequisite: C or better in MATH 6170. Introduction to basic concepts of experimental design, fundamental assumptions in analysis of variance, multiple comparison tests, complete randomized design, general linear model approach to ANOVA, various experimental designs, incomplete block designs, factorial experiments, fractional factorial experiments, response surface methods, repeated measure designs.

MATH 6210 - Topology I

Lec. 3. Cr. 3.

Prerequisite: C or better in MATH 4320 (5320) or consent of instructor. Topics in point-set topology, homotopy theory, triangulated spaces, homology theory, other topics in topology.

MATH 6220 - Topology II

Lec. 3. Cr. 3.

Prerequisite: C or better in MATH 6210. Topics in point-set topology, homotopy theory, triangulated spaces, homology theory, other topics in topology.

MATH 6240 - Representations and Characters of Groups I

Lec. 3. Cr. 3.

Prerequisite: C or better in MATH 4010/5010 while C or better in MATH 4530/5530 is recommended, or consent of instructor. FG-modules, reducibility, group algebras, FG-homomorphisms, Maschke's Theorem, Schur's Lemma, irreducible modules, characters, inner products of characters, character tables, orthogonality relations.

MATH 6250 - Representations and Characters of Groups II

Lec. 3. Cr. 3.

Prerequisite: C or better in MATH 6240. Normal subgroups and lifted characters, tensor products, restriction to a subgroup, induced modules and characters, Frobenius reciprocity relation, applications to group theory such as real representations, groups of order pq , p -groups, characters of $GL(2, q)$, symmetric groups, Burnside's Theorem, and molecular vibrations.

MATH 6270 - Mathematical Statistics

Lec. 3. Cr. 3.

Prerequisite: Consent of instructor. Statistical hypothesis, uniform most powerful tests, sufficient statistics, completeness, Rao-Cramer inequality, sequential probability ratio test, analysis of variance, multiple comparisons, nonparametric techniques.

MATH 6310 - Complex Analysis I

Lec. 3. Cr. 3.

Prerequisite: C or better in MATH 4120 (5120) or consent of instructor. Complex numbers, calculus of complex variables, analytic function. Cauchy's Theorem and complex integration, power series including Taylor's and Laurent's, residue theory with applications, conformal mapping with physical applications.

MATH 6320 - Complex Analysis II

Lec. 3. Cr. 3.

Prerequisite: C or better in MATH 6310. Complex numbers, calculus of complex variables, analytic function. Cauchy's Theorem and complex integration, power series including Taylor's and Laurent's, residue theory with applications, conformal mapping with physical applications.

MATH 6370 - Probability Theory and Stochastic Processes I

Lec. 3. Cr. 3.

Prerequisite: C or better in MATH 4480 (5480) or consent of instructor. Probability theory of sets, random variable distribution and characteristic functions, convergence, limits and law of large numbers, convolutions, compound distribution, recurrent events, random walk models, Markov chains, homogeneous, nonhomogeneous, and queuing processes.

MATH 6380 - Probability Theory and Stochastic Processes II

Lec. 3. Cr. 3.

Prerequisite: C or better in MATH 6370. Probability theory of sets, random variable distribution and characteristic functions, convergence, limits and law of large numbers, convolutions, compound distribution, recurrent events, random walk models, Markov chains, homogeneous, nonhomogeneous, and queuing processes.

MATH 6410 - Real Analysis I

Lec. 3. Cr. 3.

Prerequisite: C or better in MATH 4120 (5120) or consent of instructor. Theory of Lebesgue measure and integration, L_p spaces. Integration in locally compact space.

MATH 6420 - Real Analysis II

Lec. 3. Cr. 3.

Prerequisite: C or better in MATH 6410. Theory of Lebesgue measure and integration, L_p spaces. Integration in locally compact space.

MATH 6450 - Advanced Theory of Computation

Cross-listing: CSC 6450

Lec. 3. Cr. 3.

Prerequisite: Consent of the instructor (previous coursework involving proofs and some programming experience are needed). A rigorous treatment of the theory of computation. Topics such as: computable functions, the Church-Turing thesis, complexity theory, and P vs. NP.

MATH 6460 - Computational Methods for Graphics and Modeling

Cross-listing: CSC 6460

Lec. 3. Cr. 3.

Prerequisite: Consent of the instructor (previous coursework involving proofs and some programming experience are needed). Mathematical methods for graphics and modeling. Topics such as: 3-D transformations, ray tracing, rendering, image processing, and compression.

MATH 6470 - Environmental Statistics

Lec. 3. Cr. 3.

Prerequisite: MATH 6070 or MATH 6170 or their equivalents. This course covers statistical analysis used in environmental modeling. Topics include finite population parameter estimation, spatial sampling techniques, animal population size estimation, variogram estimation, kriging, logistic regression, and survival analysis. Familiarity with

computers is necessary. Also necessary is a background in calculus including differentiation and integration of transcendental functions and series.

MATH 6510 - Finite Difference Solutions of Partial Differential Equations

Lec. 3. Cr. 3.

Prerequisite: C or better in MATH 4510 (5510) or consent of instructor. Approximate solutions of boundary and initial value problems using the finite difference method. Elliptic, parabolic, and hyperbolic PDE's. Numerical differentiation. Solution methods for linear systems.

MATH 6520 - Finite Element Solutions of Partial Differential Equations

Lec. 3. Cr. 3.

Prerequisite: C or better in MATH 4510 (5510) or consent of instructor. Mathematical foundations of the finite element method. Approximate solutions of PDE's. Polynomial interpolation. Variational techniques. Numerical integration. Solution methods for linear systems. Isoparametric technique.

MATH 6530 - Integral Equations and Applications

Lec. 3. Cr. 3.

Prerequisite: Consent of instructor. Volterra and Fredholm equations. Green's functions, Hilbert-Schmidt and Fredholm theories. Neumann series, iterative methods.

MATH 6540 - Calculus of Variations and Applications

Lec. 3. Cr. 3.

Prerequisite: Consent of instructor. Euler equation, constraints, Lagrange multipliers, Ritz method, applications.

MATH 6610 - Operational Mathematics

Lec. 3. Cr. 3.

Prerequisite: Consent of instructor. Integral transforms (Laplace, Fourier) inversion and convolution theorems, applications.

MATH 6700 - Graph Theory

Lec.3. Credit 3.

Prerequisite: C or better grade in MATH 3400 or consent of instructor. Fundamental concepts of undirected and directed graphs, trees, connectivity, traversability, colorability, network flows, matchings and coverings, Ramsey theory, and graph minors.

MATH 6810 - Partial Differential Equations

Lec. 3. Cr. 3.

Prerequisite: Consent of instructor. First and second order PDE's, wave, heat, and Laplace's equations, applications to boundary and eigen-value problems of mathematics, physics, and engineering.

MATH 6900 - Mathematics Seminar

Lec. 1. Cr. 0-1.

MATH 6910 - Special Topics in Mathematics

Lec. 3. Cr. 3.

Prerequisite: Consent of the instructor. Individual study of advanced mathematical topics in fields of interest under the supervision of a qualified staff member.

MATH 6920 - Special Topics in Mathematics

Cr. 1-3.

Prerequisite: Consent of instructor. Individual study of advanced mathematical topics in fields of interest under the supervision of a qualified staff member.

MATH 6950 - Advanced Topics in Mathematics

Lec. 3. Cr. 3.

Prerequisite: Consent of instructor. A formal course in any area in which there is no other course offering. May be taken more than once provided the content is different.

MATH 6990 - Research and Thesis

Cr. 3,6.

MATH 6991 - Research and Independent Study

Lec. 1-3. Cr. 1-3.

Prerequisite: Consent of instructor. The purpose of this course is to foster research and independent study at the graduate level in mathematics or statistics. Students will independently study a chosen area of mathematics, explore open and significant problems, draw conclusions, and, if applicable, participate in problem solving via consulting. Students will be required to give presentations on their own investigations and conclusions, and write a research paper.

Mechanical Engineering

ME 4020 (5020) - Applied Machine Design

Lec. 2. Lab. 2. Cr. 3.

Prerequisite: ME 4010. Design for strength and rigidity under dynamic loads; shaft design; design of joints (threaded fasteners, welds, springs, keys, etc.); design of gear trains; lubrication and bearing design; finite element analysis; and optimization, and statistical consideration in design. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ME 4060 (5060) - Machine Vibrations

Lec. 3. Cr. 3.

Prerequisite: ME 3050. Linear vibration of machine elements, lumped parameter multidegree of freedom, and continuous system solutions; computer-aided solutions of linear and nonlinear systems; simple laboratory vibration measurement and comparative vibration analysis. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ME 4120 (5120) - Intermediate Dynamics

Lec. 3. Cr. 3.

Prerequisite: ME 2330. Rigid-body kinematics, plane and three-dimensional rigid-body kinetics, Lagrangian mechanics, orbital motions, variable mass rockets. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ME 4140 (5140) - Introduction to Robotics

Lec. 3. Cr. 3.

Prerequisite: ECE 3810, 3860; ME 3050, 3060. Robotic concepts and subsystems; mechanics of robots; sensors and intelligence; actuators; trajectory planning and control. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ME 4160 (5160) - Experimental Stress Analysis

Cross-listing: CEE 4160 (5160)

Lec. 2. Lab. 2. Cr. 3.

Prerequisite: CEE 3110, MATH 2910. Introduction to theory of elasticity; photoelasticity; theory and application of strain gages and rosettes; brittle coatings; holographic interferometry; moire' analysis. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ME 4180 (5180) - Finite Element Methods in Mechanical Design

Lec. 3. Cr. 3.

Prerequisite: CEE 3110. Fundamental concepts; displacement-based finite element formulation using energy methods; one-dimensional and two-dimensional finite elements; modeling considerations and convergence; programming and an introduction to a commercial program. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ME 4190 (5190) - Advanced Mechanics of Materials

Cross-listing: CEE 4190 (5190)

Lec. 3. Cr. 3.

Prerequisite: CEE 3110, MATH 2120, or consent of instructor. Advanced topics; fracture mechanics, elastic support, noncircular shafts, curved beams, thick-walled cylinders, introduction to plates, thin shells of revolution. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ME 4210 (5210) - Refrigeration and Air Conditioning

Lec. 3. Cr. 3.

Prerequisite: ME 3220, ME 3710, and ME 3720. Refrigeration systems and HVAC design concepts; air-conditioning systems, principles of psychrometrics, human comfort, and principles for building load calculations and annual energy use simulations. Students enrolled at the 5210 level will be required to complete additional work as stated in the syllabus.

ME 4220 (5220) - Air Conditioning Design

Lec. 3. Cr. 3.

Prerequisite: ME 3220, ME 3710, and ME 3720. Design of heating, cooling and ventilation systems for buildings. Duct system design, pipe system layout, and equipment selection. Students enrolled at the 5220 level will be required to complete additional work as stated in the syllabus.

ME 4260 (5260) - Energy Conversion and Conservation

Lec. 3. Cr. 3.

Prerequisite: ME 3220, 3710, or equivalent An in-depth study of industrial steam, pumping and compressed air systems in terms of how to reduce system energy consumption.

ME 4310 (5310) - Gas Dynamics

Lec. 3. Cr. 3.

Prerequisite: ME 3220 and ME 3720. Balance laws, shock waves, Prandtl/Meyer expansion, flow through ducts and nozzles, unsteady wave motion, linearized supersonic thin airfoil theory.

ME 4370 (5370) - Mechatronics and Intelligent Machines Engineering

Lec. 2. Lab. 2. Cr. 3.

Prerequisite: ECE 2050 (or ECE 2850); ME 3050; and ME 3060. Mechatronics; number systems; microcontroller technology and architecture of 8-bit microcontrollers (e.g. Motorola MC 68H110); assembly language programming; A/D and D/A conversion; parallel I/O; programmable timer operation; interfacing sensors and actuators; applications; team project on design and implementation of a mechatronic system. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ME 4380 (5380) - Introduction to Data Acquisition and Signal Processing

Lec. 2. Lab 1. Cr. 3.

Prerequisite: ME 3023, ME 3050, and ME 3060, or consent of instructor. LabVIEW programming and data acquisition with commercial hardware; digital signal processing basics including sampling, analog-to-digital conversion, quantization, aliasing, and Fourier analysis.

ME 4450 (5450) - Design for Manufacturability

Lec. 3. Lab. 2. Cr. 3.

Prerequisite: ME 3010, CEE 3110. Material and manufacturing process constraints on design shape, size, and quantity; plastic and fibrous composite parts manufacturing; rapid prototyping; design for X; dimensions and tolerances. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ME 4460 (5460) - Mechanical Properties of Materials

Lec. 3. Cr. 3.

Prerequisite: CEE 3110, ME 3010, or consent of instructor. Elastic and anelastic properties, dislocations, slip, plastic deformation, fracture mechanics, creep, fatigue and fatigue crack propagation, materials testing, and introduction to failure analysis.

ME 4470 (5470) - Interdisciplinary Studies in Ceramic Materials Processing

Cross-listing: CHE 4470 (5470)

Lec. 2. Lab. 2. Cr. 3.

Prerequisite: Senior standing in engineering, mathematics, chemistry (calculus-based), or physics. Selected materials synthesis for metals, ceramics and their composites, application of fracture mechanics and failure models, mechanical, chemical, and morphological characterization theory and practice, and materials design. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ME 4480 (5480) - Microstructure Analysis

Lec. 2. Lab. 2. Cr. 3.

Prerequisite: ME 4460 (5460). Techniques and applications of microstructural analysis; optical microscopy; metallography; electron microscopy; and fractography and failure analysis. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ME 4490 (5490) - Properties and Selection of Engineering Materials

Lec. 3. Cr. 3.

Prerequisite: ME 3010. An intermediate course in materials engineering emphasizing the interrelations among material properties, microstructure and optimum material selection for design applications. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ME 4510 (5510) - Aerodynamics

Lec. 3. Cr. 3.

Prerequisite: ME 3720. Atmospheric fluid statics, ideal fluid dynamics, potential flow, lift and drag estimation, powered flight, glides, takeoffs, landings.

ME 4610 (5610) - Steam Power Plants

Lec. 3. Cr. 3.

Prerequisite: ME 3220, ME 3710, and ME 3720. Energy sources, fuels, firing methods, boilers, turbine characteristics, cooling water and cooling towers, dust collection, new developments in energy generation, plant trip. Students enrolled at the 5610 level will be required to complete additional work as stated in the syllabus.

ME 4620 (5620) - Turbomachinery

Lec. 3. Cr. 3.

Prerequisite: ME 3720. Presents a generalized description and unified theory pertaining to the classification, operation, selection and basic design of rotating turbomachines - pumps, fans, compressors, and turbines; topics of current interest. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ME 4630 (5630) - Internal Combustion Engines

Lec. 3. Cr. 3.

Prerequisite: ME 3220, ME 3710, and ME 3720. Ideal fuel/air cycles, heat loss, friction, combustion and detonation, carburetion and fuel injection; air flow, normal overall performance, and extreme performance. Students enrolled at the 5630 level will be required to complete additional work as stated in the syllabus.

ME 4640 (5640) - Dynamics of Machinery—II

Lec. 3. Cr. 3.

Prerequisite: ME 3610. Graphical and analytical synthesis of linkage mechanisms for function generation, motion generation, and path generation. Kinetostatic analysis of linkage mechanisms; engine dynamics, balancing; rigid-body dynamics, time response analysis. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ME 4720 (5720) - Thermal Design

Lec. 3. Cr. 3.

Prerequisite: ME 3220, ME 3710, and ME 3720. Introduction to the design of thermofluid devices and systems; general design methodology, modeling, simulation, and optimization; and heat exchangers and prime movers in systems. Students enrolled at the 5720 level will be required to complete additional work as stated in the syllabus.

ME 4730 (5730) - Numerical Heat Transfer

Lec. 3. Cr. 3.

Prerequisite: ME 3710, ME 3720. Fundamentals of numerical methods; steady and unsteady one-dimensional heat conduction; steady and unsteady multidimensional heat conduction; fully-developed duct flows; one- and two-dimensional convection heat transfer; flow through porous media. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ME 4810 (5810) - Automatic Control

Lec. 3. Cr. 3.

Prerequisite: ME 3050. Mathematical modeling of physical systems, control algorithms, stability, transient response, and frequency response.

ME 4900 (5900) - Special Topics

Cr. 1-3.

Special topics of current interest in mechanical engineering that are not covered in existing courses. Students enrolled at the 5900 level will be required to complete additional work as stated in the syllabus.

ME 4930 (5930) - Noise Control

Cross-listing: CEE 4930 (5930)

Lec. 2. Lab. 2. Cr. 3.

Prerequisite: MATH 2120 and PHYS 2110. Identification and description of noise sources and noise radiation, methods of noise measurement and criteria for noise levels, principles and techniques of noise control. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

ME 5710 - Propulsion

Lec. 3 Cr. 3

Prerequisite: ME 3220 and ME 3720 This course presents aerospace propulsive devices as systems, with functional requirements and engineering and environmental limitations along with requirements and limitations that constrain design choices. Both air-breathing and rocket engines are covered, at a level which enables rational integration of the propulsive system into an overall vehicle design. Mission analysis, fundamental performance relations, and exemplary design solutions are presented. Additional assignment is required for graduate students.

ME 6010 - Conduction Heat Transfer

Lec. 3. Cr. 3.

Conduction in steady, periodic, and transient systems; analytical and numerical techniques. Undergraduate level courses in heat transfer and introduction to partial differential equations needed for this course.

ME 6030 - Radiation Heat Transfer

Lec. 3. Cr. 3.

Properties and laws of radiation; black and gray absorbing and emitting media, real and ideal systems.
Undergraduate level courses in heat transfer and introduction to partial differential equations needed for this course.

ME 6040 - Intermediate Fluid Mechanics

Cross-listing: CEE 6040, CHE 6040

Lec. 3. Cr. 3.

Formulation of mass and momentum transfer equations; exact solutions of laminar parallel flows; similarity and approximate solutions; potential flow; laminar momentum boundary layers. Undergraduate level courses in fluid mechanics and introduction to partial differential equations needed for this course.

ME 6050 - Convection Heat Transfer

Lec. 3. Cr. 3.

Prerequisite: ME 6040, or consent of instructor. Formulation of energy equation; forced and natural convection heat transfer; heat and momentum transfer analogies, exact and approximate solutions; thermal boundary layers.

ME 6210 - Advanced Thermodynamics

Lec. 3. Cr. 3.

Thorough, in-depth study of the first and second laws of thermodynamics from a macroscopic perspective, concept of energy and availability, general thermodynamic property relationships, property representation for computerized analyses, mixtures and solutions, chemical reactions. One (1) year of undergraduate thermodynamics is needed for this course.

ME 6350 - Finite Element Analysis

Cross-listing: CEE 6350

Lec. 3. Cr. 3.

Prerequisite: CEE 4130/5130 or CEE 4190/5190 or ME 4180/5180 or consent of instructor Introduction to analysis of stresses in a continuum by the finite element method. Computer applications.

ME 6360 - Introduction to Continuum Mechanics

Cross-listing: CEE 6360

Lec. 3. Cr. 3.

Prerequisite: Consent of instructor. Tensors, balance, laws, constitutive equations, thermodynamic restrictions, applications.

ME 6370 - Vibrations of Continuous Media

Cross-listing: CEE 6370

Lec. 3. Cr. 3.

Governing equations for strings, bars, and membranes; natural frequencies; normal modes; series solutions; wave propagation; transform methods; characteristics. Undergraduate level courses in mechanics of materials, introduction to partial differential equations, and vibrations are needed for this course.

ME 6430 - Fundamentals of Acoustics

Lec. 3. Cr. 3.

Prerequisite: MATH 4510 (5510) or consent of instructor. Wave equation and one-dimensional solutions; Reflection and transmission; Absorption of sound waves; sources and receivers.

ME 6440 - Applied Acoustics

Lec. 3. Cr. 3.

Three-dimensional plane, cylindrical, and spherical waves; waves in enclosures, in horns; architectural acoustics; ultrasonics. Undergraduate introduction to partial differential equations or consent of instructor needed for this course.

ME 6510 - Motion Programming of Planar Mechanisms

Lec. 3. Cr. 3.

Structural analysis and synthesis of mechanisms; mobility of mechanisms; Burmester theory; instantaneous kinematics and curvature theory; design of planar mechanisms for prescribed finite positions, higher order motions, mixed positions, and complex motions; computer aided linkage synthesis. Undergraduate level courses in Dynamics of Machinery, Dynamics of Machinery II, or Robotics needed for this course.

ME 6610 - Fatigue and Wear in Mechanical Design

Lec. 3. Cr. 3.

Design for life and reliability, consideration of stress-life fatigue, strain-life fatigue, fatigue crack growth, and wear; applications and analysis tools. Undergraduate level course in applied machine design or consent of instructor needed for this course.

ME 6620 - Plasticity and Creep in Mechanical Design

Lec. 3. Cr. 3.

Design for static strength and creep resistance, consideration of plastic mechanical and thermal stress-strain states; applications and analysis tools. Undergraduate level courses in applied machine design or consent of instructor needed for this course.

ME 6640 - Advanced Robotics

Lec. 2. Lab.2. Cr. 3.

Design, analysis, programming, dynamics, and control of robotic systems; mobile robots; walking robots; redundancy and manipulability, applications and projects. Undergraduate level courses in robotics needed for this course.

ME 6710 - Advanced Dynamics of Machinery

Lec. 3. Cr. 3.

Prerequisite: ME 4640 (5640). Relative motion of two- and three-dimensional systems; dynamics of particles and machine elements; Lagrangian mechanics; energy methods, equations of motion and computer-aided solution methods, analysis and synthesis of linear and nonlinear mechanical dynamic systems; dynamics of planar linkages, gear trains, and cam-follower systems; balancing of rotors and mechanisms; engine dynamics.

ME 6730 - Modal Vibration Analysis

Lec. 2. Lab. 2. Cr. 3.

Fourier transforms. Linear vibration analysis of n degree of freedom mechanical structures. Laboratory experience with rectangular and curved structures. Evaluation of mode shape, natural frequencies and damping coefficients. Computer model compared to a laboratory solution. Undergraduate level course in machine vibrations needed for this course.

ME 6760 - Smart Materials and Structures

Lec. 3. Cr. 3.

Prerequisite: Undergraduate courses in Differential Equations, Mechanics of Materials, and System Dynamics, or consent of instructor. Governing physical principles of ceramic, metallic, and polymeric smart materials; constitutive modeling of piezoelectric ceramics; static and dynamic modeling of piezoelectric material systems. Piezoelectrics, shape memory alloys, and electroactive polymers will be discussed. Undergraduate level courses in differential equations, mechanics of materials, and system dynamics (e.g. Dynamic Modeling and Control) required for this course.

ME 6810 - Advanced Materials Science-I

Lec. 3. Cr. 3.

Diffusion in the solid state, binary and ternary phase diagrams, reaction kinetics, alloy design, and advanced materials characterization. Undergraduate level course in materials and processing needed for this course.

ME 6830 - Advanced Computer-Aided Design and Manufacturing

Lec. 2. Lab. 2. Cr. 3.

Modeling and simulation methods to understand the impact of product design on manufacturing; transforming CAD geometry into useful modeling representations; thermal and dynamics loads, geometric and material; and structural optimization. Undergraduate level course in machine design and finite element analysis or consent of instructor needed for this course.

ME 6910 - Introduction to Graduate Research

Lec. 1. Cr. 1.

Prerequisite: Graduate student standing. Research tools and written and oral presentations in Mechanical Engineering; graduate thesis; ethics in research.

ME 6920 - Security of Networked Control Systems

Lec. 3 Cr. 3

Prerequisite: Undergraduate courses in Differential Equations, Control Systems, and System Dynamics, or consent of instructor This course is an introduction to the security of networked control systems. It covers communication protocols and network security issues related to networked control systems. The stability of networked control systems will be investigated to examine the robustness of the control systems. It also covers common types of attacks, model-based and learning detection and compensation techniques for designing secure networked control system.

ME 6930 - Theory of Elasticity

Cross-listing: CEE 6930

Lec. 3. Cr. 3.

Prerequisite: Consent of instructor. Fundamental laws of continuum mechanics; Cartesian tensors; analysis of stress and strain; two-dimensional problems in rectangular and polar coordinates; torsion of various shaped shafts.

ME 6960 - Non-Thesis Project

Cr. 3.

Individual project-based course which demonstrates the student's capability to engage in independent learning.

ME 6970 - Selected Topics

Cr. 1-3.

Prerequisite: Approval by departmental chairperson. Selected topics of current interest in graduate-level mechanical engineering that are not covered in existing graduate courses.

ME 6980 - Directed Study

Cr. 1-3.

Prerequisite: Approval by departmental chairperson. Individual or small-group study of topics of current interest in graduate-level mechanical engineering.

ME 6990 - Research and Thesis

Cr. 1, 3, 6, 9.

ME 7040 - Mass Transfer

Lec. 3. Cr. 3.

Prerequisite: ME 6050. Mass diffusion in solids, liquids, and gases; transport equations for multicomponent systems; laminar forced and natural convective mass transfer; mass transfer in turbulent flows; interface mass transports.

ME 7070 - Fluid Mechanics of Suspensions

Lec. 3. Cr. 3.

Prerequisite: ME 6040, or ME 6360, or consent of instructor. Balance laws; constitutive equations; exact solutions; applications.

ME 7080 - Advanced Viscous Flow

Lec. 3. Cr. 3.

Prerequisite: ME 6040, or ME 6360, or consent of instructor. Steady and transient solutions of Navier- Stokes equations; advanced similarity solutions; flows with variable thermal properties and viscous dissipation; elementary non-Newtonian flow; stability of laminar flow and transition to turbulence.

ME 7090 - Computational Fluid Dynamics

Lec. 3. Cr. 3.

Prerequisite: ME 6040, or ME 6360, or consent of instructor. Computation of inviscid, boundary-layer, supersonic, and transonic flows; models of turbulence; compressible Navier-Stokes equations.

ME 7100 - Turbulence

Lec. 3. Cr. 3.

Prerequisite: ME 6040, or ME 6360, or consent of instructor. Balance laws; Reynolds stresses; microscale transport equations; shear layers, statistical theories, measurements.

ME 7510 - Space Mechanisms

Lec. 3. Cr. 3.

Prerequisite: ME 6360, or ME 6930, or consent of instructor. Methods of analysis and synthesis of spherical and

spatial manipulators/mechanisms using displacement matrices, screw vectors, screw matrices and quaternions, type of space mechanisms, mobility criteria; and transmission criteria.

ME 7600 - Theory of Plates and Shells

Cross-listing: CEE 7510

Lec. 3. Cr. 3.

Prerequisite: CEE 6930 or consent of instructor. Bending and buckling of thin plates and shells. Vibration analysis of plates and shells.

ME 7620 - Advanced Finite Element Analysis

Cross-listing: CEE 7620

Lec. 3. Cr. 3.

Prerequisite: ME 6350 or consent of instructor. Finite element analysis of coupled differential equations. Higher order and isoparametric element formulations. Applications to problems in stress analysis, vibrations, heat transfer and fluid mechanics. Introduction to commercial programs.

ME 7640 - Theory of Inelastic Material Behavior

Cross-listing: CEE 7640

Lec. 3. Cr. 3.

Prerequisite: CEE 6930 or ME 6360. Constitutive equations for classical viscoelasticity. Exact solutions for simple constitutive laws. Incremental stress-strain relations for plasticity; yield surface and deformation theories. Application to engineering problems.

ME 7650 - Continuum Theories of Materials

Cross-listing: CEE 7650

Lec. 3. Cr. 3.

Prerequisite: CEE 6930 or ME 6360 or consent of instructor. Continuum thermodynamics; balance laws and constitutive equations; applications for simple fluids, solids, thermoelastic solids, thermodiffusion and electrodynamics.

ME 7660 - Fracture Mechanics

Cross-listing: CEE 7710

Lec. 3. Cr. 3.

Prerequisite: CEE 6930/ME 6930 Griffith-Irwin Theory, stress intensity factors; crack tip stresses; plasticity; fatigue crack propagation; fracture toughness testing; experimental aspects; design applications; special topics.

ME 7670 - Fiber-Reinforced Composite Materials

Cross-listing: CEE 7720

Lec. 2. Lab. 2. Cr. 3.

Prerequisite: ME 6930/CEE 6930 Properties of orthotropic lamina; lamination theory; micromechanics; engineering tests; lamina strength theories; laminate strength theories, laminate strength; stress concentration effects.

ME 7680 - Theory of Elastic Stability

Cross-listing: CEE 7820

Lec. 3. Cr. 3.

Prerequisite: CEE 6930 or consent of instructor. Beams-columns; elastic buckling of bars and frames; torsional buckling of thin-walled structures; lateral buckling of beams; bending and buckling of thin plates and shells.

ME 7720 - Transfer Function Synthesis of Dynamic Systems

Lec. 2. Lab. 2. Cr. 3.

Prerequisite: ME 6710, ME 6730. Analysis of transfer function derivation, signature analysis of pulse excitation, transfer function synthesis from experimental data.

ME 7810 - Advanced Materials Science-II

Lec. 3. Cr. 3.

Prerequisite: ME 6810 or equivalent. Advanced materials science with emphasis on solid state theories. Free electrons. The crystal lattice. Electrons in the lattice. Defect interactions.

ME 7970 - Selected Topics

Cr. 1-3.

Prerequisite: Approval by departmental chairperson. Selected topics of current interest in graduate-level mechanical engineering that are not covered in existing graduate courses.

ME 7980 - Directed Study

Cr. 1-3.

Prerequisite: Approval by departmental chairperson. Individual or small-group study of topics of current interest in graduate-level mechanical engineering.

ME 7990 - Research and Dissertation

Cr. 1,3,6,9.

Music

MUS 4110 (5110) - History and Literature of Jazz

Lec. 2. Cr. 2.

Jazz traced from its multiethnic origin to its present day form and its influences on American culture. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MUS 4120 (5120) - Contemporary Music

Lec. 2. Cr. 2.

Prerequisite: MUS 3010 or 3020, MUS 2110-2120. The culture of musical pluralism since World War II, including art music, jazz, rock, and folk. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MUS 4150 (5150) - Computer Applications in Music

Lec. 3. Lab. Arr. Cr. 3.

Prerequisite: MUS 2130. An introduction to computer applications in music performance, composition, teaching, and related fields. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MUS 4250 (5250) - Recording Techniques

Lec. 2. Lab. Arr. Cr. 2.

Prerequisite: MUS 2130. An introduction to sound recording, including analog and digital formats. Emphasis on applications appropriate to performing musicians. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MUS 4400 (5400) - Composition

Cr. 1-3.

Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MUS 4500 (5500) - Conducting

Cr. 1-3.

Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MUS 4710 (5710) - Supervised Teaching Experience I

Cr. 1-3.

Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MUS 4720 (5720) - Supervised Teaching Experience II

Cr. 2.

Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MUS 5075 - Afro-Caribbean Ensemble

lec. 2. Cr. 0-1

Students will explore and learn about the Afro-Caribbean culture through a hands-on study of Afro-Caribbean instruments, imported from Trinidad and Tobago, as well as other authentic resources. This hands-on pedagogical approach will enhance the students' educational interest, understanding, and appreciation for the Afro-Caribbean diaspora, while increasing their involvement with the campus and community. As part of the students' assessment, members of this ensemble will be expected to participate in public concerts, educational workshops, and assembly presentations. These service opportunities will provide students with an enriched educational experience and promote personal growth as they become community ambassadors for cultural diversity.

MUS 6000 - Ensemble Performance

Lab. 2-5. Cr. 1.

Participation in music ensemble with the area of specialization. May be repeated for credit.

MUS 6010 - Research Techniques in Music

Lec. 3. Cr. 3.

An overview of bibliographic sources in music research. Scholarly writing and presentation in area of emphasis.

MUS 6100 - Proseminar in Style and Analysis

Lec. 3. Cr. 3.

In-depth analysis of all parameters of selected musical examples; compositional procedures as a means of developing an intelligent rationale for interpretation.

MUS 6110 - Score Study and Realization

Lec. 3. Cr. 3.

Techniques, principles, and practices of musical score preparation and analysis including solfeggio and appropriate keyboard skills.

MUS 6120 - Seminar in Music Education

Lec. 3. Cr. 3.

A study of current methods and materials in Music Education (K-12) with an emphasis on research findings and applications.

MUS 6200 - Seminar in Music History

Lec. 3. Cr. 3.

Focus on major genre, styles, or selected composers for an in-depth study of a particular topic.

MUS 6220 - Survey of Literature for Homogeneous Ensembles

Lec. 3. Cr. 3.

A survey of the history and development of literature for homogeneous ensembles from early origins to the present.

MUS 6330 - Advanced Choral/Instrumental Techniques

Lec. 3. Cr. 3.

Techniques and methodologies for teaching performing ensembles, grades 6-12.

MUS 6400 - Applied Study

Lec. 1-2. Cr. 1-2.

Private study in the specialized medium of performance. May be repeated for credit.

MUS 6800 - Graduate Recital Performance

Cr. 1.

Performance of representative literature for the appropriate area of specialization.

MUS 6900 - Graduate Performance Document

Cr. 2.

A scholarly paper reporting the results of research into problems such as style or analysis, which correlates with the Graduate Recital Performance MUS 6800.

Music Education

MUED 4850 (5850) - Workshop in Music Education

Cr. 1-3.

Laboratory approach providing opportunities for experienced music education personnel to study in depth music educational problems. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

MUED 6600 - Foundations of Music Education

Lec. 3. Cr. 3.

A study of the historical foundations, aesthetic philosophies, practices, and reforms in music education.

MUED 6920 - Topics

Cr. 1-6.

Laboratory approach providing opportunities for experienced music educators to study specialty areas.

Nursing

NRSE 5314 - ADVANCED APPLICATION IN DELIVERY OF ADVANCED PEDIATRIC PRIMARY CARE – PRECEPTORSHIP & CERTIFICATION PREP

Lec. 3. Credit 3.

Prerequisite: NRSE 5315, 5305, 5306, 5316, 5311, 5312, 5317 Integration of pediatric primary care knowledge development and evidence-based advanced pediatric primary care concepts with application and preceptorship experiences. Includes preparation for the PNCB certification exam.

NRSE 5315 - HEALTH PROMOTION OF THE GROWING CHILD

Lec. 2 Credit 2.

Prerequisite: Admission to the graduate program. The role of the advanced practice pediatric nurse in health promotion of the growing child is explored. Lifespan, growth, behavior, and development from birth to adolescence is examined in the context of lifespan development and population-specific approach to pediatric health care visits in the primary care setting.

NRSE 5316 - PEDIATRIC PRIMARY CARE III – CHRONIC ILLNESS, DISABILITY, AND COMPLEX CONDITIONS

Lec. 3. Credit 3.

Prerequisite: NRSE 5009, 5010, 5016, 5018, 5315, 5305, 5311 Corequisite: NRSE 5317 The role of the advanced practice pediatric nurse in care of the child with chronic illness, disability, and complex conditions is explored. Pathophysiology, epidemiology, risk factors, screening and diagnostics, management and patient education around chronic illness, disability, and complex conditions is examined. The importance of continuity of care is emphasized.

NRSE 5317 - ADVANCED PEDIATRIC NURSING PRACTICUM III

Lec. 3. Credit 3.

Prerequisite: NRSE 5009, 5010, 5016, 5018, 5315, 5305, 5311 Corequisite: NRSE 5316 Precepted practicum in pediatric primary care. Integration of advanced practice primary care pediatric concepts for healthy and ill children including management of children with chronic illness, disability, and complex child health conditions.

NRSE 5612 - ACUTE CARE & PHARMACOTHERAPEUTICS

Lec. 3. Credit 3.

Prerequisite: Per instructor discretion. This course covers current pharmacotherapeutics used in designing care of adults and older adults with complex acute, chronic, and critical conditions.

NRSE 5613 - ADVANCED PATHOPHYSIOLOGY AND CLINICAL REASONING FOR ACUTE DISEASE MANAGEMENT Practicum 1

Lec. 2 Credit 2.

Prerequisite: Per Instructor's Discretion Corequisite: NRSE 5604 This course provides students with the opportunity to apply advanced knowledge of complex disease processes and management issues to a hospitalized population of adults and older adults.

NRSE 5614 - ADVANCED PATHOPHYSIOLOGY & CLINICAL REASONING FOR ACUTE CARE MANAGEMENT PRACTICUM II

Lec. 2 Credit 2.

Prerequisite: Per instructor' discretion. Corequisite: NRSE 5608 This course provides students with the opportunity to apply advanced knowledge of selected complex disease processes and management issues to a critical care population of adults and older adults.

NRSE 5616 - Internship in Acute Care NP Practice

Lec. 2 Credit 2.

Prerequisite: Permission of instructor. This internship experience focuses on the synthesis of previously gained knowledge and skills to provide advanced nursing care for individuals, families, and communities. Emphasis is placed on health promotion, disease prevention and clinical management of clients with common acute and chronic illness in acute care settings.

NRSE 5617 - Diagnostic Interpretation & Therapeutic Modalities Practicum

Lec. 2 Credit 2.

Prerequisite: NRSE 5616 and NRSE 6021 Corequisite: NRSE 5610 This course applies advanced assessment skills to incorporate diagnostic testing and current therapies to provide complex care for adults and older adults with complex acute, chronic and critical conditions.

NRSE 5711 - Women's Health for Advance Practice IV Practicum

Lec. 2 Credit 2.

Prerequisite: Permission of instructor. This cumulating clinical course provides students with the opportunity to apply advanced knowledge of complex female disease processes and management issues to patients across the lifespan in the clinical setting.

NRSE 5712 - Women's Health for Advanced Practice II: OB

Lec. 4 Credit 4

Prerequisite: NRSE 5016, 5009, 5010, 5018 Corequisite: NRSE 5715 Knowledge development and integration of advanced care concepts utilizing evidence-based concepts in the diagnosis and management of the obstetrical client.

NRSE 5713 - Complex Issues in Women's Health

Lec. 3. Credit 3.

Prerequisite: NRSE 5016, 5009, 5010, 5018 Corequisite: NRSE 5716 Application of advanced knowledge of selected complex disease processes and management issues in women's health.

NRSE 5714 - Women's Health for Advanced Practicum I: GYN

Lec. 2 Credit 2.

Prerequisite: NRSE 5016, 5009, 5010, 5018 Corequisite: NRSE 5702 Integration of knowledge development and advanced care concepts utilizing evidence-based concepts in the diagnosis, management, and treatment of the gynecological client across the life span in the clinical setting.

NRSE 5715 - Women's Health for Advanced Practicum II: OB

Lec. 2 Credit 2.

Prerequisite: NRSE 5016, 5009, 5010, 5018 Corequisite: NRSE 5712 Integration of knowledge development and advanced care concepts utilizing evidence-based concepts in the diagnosis, management, and treatment of the obstetric client across the life span in the clinical setting.

NRSE 5716 - Women's Health for Advanced Practice III: Practicum

Lec. 2 Credit 2.

Prerequisite: NRSE 5016, 5009, 5010, 5018 Corequisite: NRSE 5713 Integration and application of advanced care concepts utilizing evidence-based concepts in the diagnosis, management, and treatment of the female client across the lifespan in the clinical setting.

NRSE 6021 - Application of Advanced Skills in Acute Care

Lec. 2 Credit 2.

Prerequisite: Permission of Instructor Transition into the DNP role and the development of advanced practice skills and their integration in the diagnosis and management of acute and chronic clinical problems in acute care settings in adults and older adults.

NRSE 6022 - Strategic Planning for Health Care

Lec. 2 Credit 2.

Prerequisite: Permission of Instructor. Applies the concepts of strategic planning within the context of the health care industry. Issues associated with competing in a changing health care environment are explored with a focus on the development of solutions to problems associated with his change. The strategic management of health care delivery will be addressed from a variety of perspectives, ranging from those of the insurance industry, to public health facilities, to large health care networks, to small practices of health care providers.

NRSE 6023 - Palliative/End of Life Care and the APN

Lec. 2 Credit 2.

Prerequisite: Permission of Instructor. Applies the concepts of culturally congruent palliative and end-of-life care within the context of the advance practice nurse . Issues associated with families and persons who are severely ill or dying in the health care environment are explored with a focus on the APN (APN) and assessment, management, and evaluation of ethical palliative and EOLC solutions to problems associated with being severely ill and dying.

NRSE 6024 - ADVANCED CONCEPTS IN PATHOPHYSIOLOGY

Lec. 2 Credit 2.

Prerequisite: Permission of Instructor. Application and integration of advanced pathophysiologic concepts in the management of acute care problems in the adult and older populations.

NURS 4210 - Health Care Research

Cr. 3.

Prerequisite: Statistics and/or permission of the instructor. This course builds upon the student's liberal arts background and basic health care knowledge, utilizing systematic inquiry and analysis by reinforcing the problem-solving method to utilize research in the improvement of health care practice to effect positive outcomes.

NURS 4211 - Nursing Leadership and Management

Cr. 3.

Prerequisite: Admission to RODP-MSN program as a "bridge" student, or special permission; current RN licensure; completed bachelor's degree. This course examines managerial and leadership concepts, issues, roles, and functions as applied to the role of the professional nurse in various healthcare settings.

NURS 4212 - Trends and Issues in Nursing and Healthcare

Cr. 3.

Prerequisite: Admission to RODP-MSN as a "bridge" student, or special permission; RN licensure; bachelor's degree. This course explores and analyzes socioeconomic and political variables that affect professional nursing and healthcare.

NURS 4213 - Community Health

Cr. 3.

Prerequisite: Admission to the RODP-MSN program as a "bridge" student. Community Health provides a theoretical background for the study of community health nursing and is based on the synthesis of nursing theory and public health science. Emphasis is on health promotion, health maintenance and disease prevention among populations. The course assists students to recognize and analyze the interrelationships between individuals, families, population groups, and communities in determining the health status of each. The impact of political, economic, social, environmental, and cultural concerns on the health of populations is examined.

NURS 4350 (5350) - Healthcare of Communities

Lec.4. Cr. 4.

This course focuses on the nursing process and dynamics of family, community, national and international groups. This course encompasses knowledge of growth and development, culture, family and pathophysiology from the natural and social sciences and liberal arts. The epidemiological process is explored and applied to various diseases in a variety of populations. Emphasis is placed on the three level of prevention as it holistically applies to community groups and problems.

NURS 5009 - Health Assessment Throughout the Lifespan

Cross-listing: NRSE 5009

Lec. 3. Cr. 3.

Advanced health assessment focuses on the assessment of the total health status of individual and family clients throughout the life span. Emphasis is placed on the decision-making processes to differentiate normal from abnormal health status. Content includes predictable pathological findings and the mechanisms underlying them.

NURS 5305 - PEDIATRIC PRIMARY CARE I- WELL CHILD

Lec. 3. Credit 3.

Prerequisite: NURS 6101, 6102, 6103, 6104 Corequisite: NURS 5311 Health promotion within the context of illness, disease, or injury prevention is examined. The importance of frequent wellness assessments and early intervention in relation to developmental risk and disability is emphasized. The role of the advanced practice pediatric nurse in care of the well child is explored.

NURS 5306 - PEDIATRIC PRIMARY CARE II- EPISODIC AND MINOR ACUTE ILLNESS

Lec. 3. Credit 3.

Prerequisite: NURS 6101, 6102, 6103, 6104, 5305 & 5311 Corequisite: NURS 5312 The role of the advanced practice pediatric nurse in care of the child with episodic and minor acute illness is explored. Pathophysiology, epidemiology, risk factors, screening and diagnostic tests, management, and patient education around episodic and minor acute illness is emphasized.

NURS 5311 - PEDIATRIC PRIMARY CARE I- WELL CHILD PRACTICUM

Lec. 3. Credit 3.

Prerequisite: NURS 6101, 6102, 6103, 6104 Corequisite: NURS 5305 Health promotion within the context of illness, disease, or injury prevention is examined. The importance of frequent wellness assessments and early intervention in relation to developmental risk and disability is emphasized. The role of the advanced practice pediatric nurse in care of the well child is explored.

NURS 5312 - Advanced PEDIATRIC NURSING PRACTICUM II

Lec. 3. Credit 3.

Prerequisite: NURS 6101, 6102, 6103, 6104, 5305 & 5311 Corequisite: NURS 5306 Precepted practicum in pediatric primary care. Advanced practice clinical experiences in differential diagnosis and management of episodic and minor acute illnesses are emphasized.

NURS 5314 - ADVANCED APPLICATION IN DELIVERY OF ADVANED PEDIATRIC PRIMARY CARE-PRECEPTORSHIP & CERTIFICATION PREP

Lec. 2; Lab 1 Credit 3.

Prerequisite: NURS 6101, 6102, 6103, 6104, 5305, 5311, 5306, 5312, 5316 & 5317 Integration of pediatric primary care knowledge development and evidence-based advanced pediatric primary care concepts with application and preceptorship experiences. Includes preparation for the PNCB certification exam.

NURS 5315 - HEALTH PROMOTION OF THE GROWING CHILD

Lec. 2 Credit 2.

Prerequisite: NURS 6101, 6102, 6103, 6104 The role of the advanced practice pediatric nurse in health promotion of the growing child is explored. Lifespan, growth, behavior, and development from birth to adolescence is examined in the context of lifespan development and population-specific approach to pediatric health care visits in the primary care setting.

NURS 5316 - PEDIATRIC PRIMARY CARE III-CHRONIC ILLNESS, DISABILITY, AND COMPLEX CONDITIONS

Lec. 3. Credit 3.

Prerequisite: NURS 6101, 6102, 6103, 6104, 5305, 5311, 5306 & 5312 Corequisite: NURS 5317 The role of the advanced practice pediatric nurse in care of the child with chronic illness, disability, and complex conditions is explored. Pathophysiology, epidemiology, risk factors, screening and diagnostics, management and patient education around chronic illness, disability, and complex conditions is examined. The importance of continuity of care is emphasized.

NURS 5317 - ADVANCED PEDIATRIC NURSING PRACTICUM III

Lec. 3. Credit 3.

Prerequisite: NURS 6101, 6102, 6103, 6104, 5305, 5311, 5306 & 5312 Corequisite: NURS 5316 Precepted practicum in pediatric primary care. Integration of advanced practice primary care pediatric concepts for healthy and ill children including management of children with chronic illness, disability, and complex child health conditions.

NURS 5604 - ADVANCED PATHOPHYSIOLOGY AND CLINICAL REASONING FOR ACUTE DISEASE MANAGEMENT

Lec. 3. Credit 3.

Prerequisite: NURS 6101, 6102, 6103, 6104 Corequisite: NURSE 5613

NURS 5608 - ADVANCED PATHOPHYSIOLOGY AND CLINICAL REASONING FOR ACUTE DISEASE MANAGEMENT II

Lec. 3. Credit 3.

Prerequisite: NURS 6101, 6102, 6103, 6104, 5604, 5613 Corequisite: NURS 5614 This course provides in-depth study of complex disease processes to diagnosis and manage acute and chronic clinical problems in critically ill adults using current evidence.

NURS 5610 - DIAGNOSTIC INTERPRETATION & THERAPEUTIC MODALITIES

Lec. 3. Credit 3.

Prerequisite: NURS 6101, 6102, 6103, 6104, 5604, 5613, 5608 & 5614 Corequisite: NURS 5617 This course builds on advanced assessment skills to incorporate diagnostic testing and current therapies to provide complex care for adults and older adults with complex acute, chronic and critical conditions.

NURS 5612 - ACUTE CARE & PHARMACOTHERAPEUTICS

Lec. 3. Credit 3.

Prerequisite: NURS 6101, 6102, 6104 This course covers current pharmacotherapeutics used in designing care of adults and older adults with complex acute, chronic, and critical conditions,

NURS 5613 - ADVANCED PATHOPHYSIOLOGY AND CLINICAL REASONING FOR ACUTE DISEASE MANAGEMENT Practicum I

Lec. 2 Credit 2.

Prerequisite: NURS 6101, 6102, 6103, 6104 Corequisite: NURS 5604 This course provides students with the opportunity to apply advanced knowledge of complex disease processes and management issues to a hospitalized population of adults and older adults.

NURS 5614 - ADVANCED PATHOPHYSIOLOGY AND CLINICAL REASONING FOR ACUTE DISEASE MANAGEMENT II PRACTICUM

Lec. 2 Credit 2.

Prerequisite: NURS 6101, 6102, 6103, 6104, 5604, 5613 Corequisite: NURS 5608 This course provides students with the opportunity to apply advanced knowledge of selected complex disease processes and management issues to a critical care population of adults and older adults.

NURS 5616 - INTERNSHIP IN ACUTE CARE NP PRACTICE

Lec. 2 Credit 2.

Prerequisite: NURS 6101, 6102, 6103, 6104, 5604, 5613, 5608, 5614, 5610 & 5617 Corequisite: NURS 6021 This internship experience focuses on the synthesis of previously gained knowledge and skills to provide advanced nursing care for individuals, families, and communities. Emphasis is placed on health promotion, disease prevention and clinical management of clients with common acute and chronic illness in acute care settings.

NURS 5617 - DIAGNOSTIC INTERPRETATION & THERAPEUTIC MODALITIES Practicum

Lec. 2 Credit 2.

Prerequisite: NURS 6101, 6102, 6103, 6104, 5604, 5613, 5608 & 5614 Corequisite: NURS 5610 This course applies advanced assessment skills to incorporate diagnostic testing and current therapies to provide complex care for adults and older adults with complex acute, chronic and critical conditions.

NURS 5701 - PHARMACOLOGY FOR WOMEN'S HEALTH

Lec. 2 Credit 2.

Prerequisite: NURS 6101, 6102, 6103, 6104 Knowledge development and integration of advanced care concepts utilizing evidence-based concepts in the diagnosis and management of the gynecological client across the life span.

NURS 5702 - WOMEN'S HEALTH FOR ADVANCED PRACTICE I: GYN

Lec. 3. Credit 3.

Prerequisite: NURS 6101, 6102, 6103, 6104 Corequisite: NURS 5714 Knowledge development and integration of advanced care concepts utilizing evidence-based concepts in the diagnosis and management of the gynecological client across the life span.

NURS 5710 - PRIMARY CARE FOR WOMEN'S HEALTH

Lec. 3. Credit 3.

Prerequisite: NURS 6101, 6102, 6103, 6104 Integration of pathophysiology, assessment, and diagnosis in the management of common primary health care needs of women.

NURS 5711 - WOMEN'S HEALTH FOR ADVANCED PRACTICE IV PRACTICUM

Lec. 2 Credit 2.

Prerequisite: NURS 6101, 6102, 6103, 6104, 5702/5714, 5712/5715, 5713/5716 This cumulating clinical course provides students with the opportunity to apply advanced knowledge of complex female disease processes and management issues to patients across the lifespan in the clinical setting.

NURS 5712 - WOMEN'S HEALTH FOR ADVANCED PRACTICE II: OB

Lec. 4 Credit 4

Prerequisite: NURS 6101, 6102, 6103, 6104 Corequisite: NURS 5715 Knowledge development and integration of advanced care concepts utilizing evidence-based concepts in the diagnosis and management of the obstetrical client.

NURS 5713 - Complex Issues in Women's Health

Lec. 3. Credit 3.

Prerequisite: NURS 6101, 6102, 6103, 6104 Corequisite: NURS 5716 Application of advanced knowledge of selected complex disease processes and management issues in women's health.

NURS 5714 - WOMEN'S HEALTH FOR ADVANCED PRACTICUM I: GYN

Lec. 2 Credit 2.

Prerequisite: NURS 6101, 6102, 6103, 6104 Corequisite: NURS 5702 Integration of knowledge development and advanced care concepts utilizing evidence-based concepts in the diagnosis, management, and treatment of the gynecological client across the life span in the clinical setting.

NURS 5715 - WOMEN'S HEALTH FOR ADVANCED PRACTICUM II: OB

Lec. 2 Credit 2.

Prerequisite: NURS 6101, 6102, 6103, 6104 Corequisite: NURS 5712 Integration of knowledge development and advanced care concepts utilizing evidence-based concepts in the diagnosis, management, and treatment of the obstetric client across the life span in the clinical setting.

NURS 5716 - WOMEN'S HEALTH FOR ADVANCED PRACTICE III: PRACTICUM

Lec. 2 Credit 2.

Prerequisite: NURS 6101, 6102, 6103, 6104 Corequisite: NURS 5713 Integration and application of advanced care concepts utilizing evidence-based concepts in the diagnosis, management, and treatment of the female client across the lifespan in the clinical setting.

NURS 5900 - Independent Study in Nursing

Lec. Credit: 1-3

Prerequisite: Admission to the MSN program and consent of instructor. Advanced study on an individual basis focusing on an area/topic related to nursing.

NURS 6000 - Theoretical Foundations

Cr. 3.

Prerequisite: Admission to the MSN program or permission of Coordinator. This course provides the student with the theoretical foundations for advanced nursing. The focus of the course is on the critical components of contemporary nursing knowledge; exploration of the nature of theory development in nursing; examination of relevance of concepts from basic and applied sciences; analysis and evaluation of nursing and related theories; and relevance of theory in terms of impact on professional nursing practice, and individuals, families, groups as clients in health care systems.

NURS 6001 - Health Care Policy

Cr. 3.

Prerequisite: Admission to the MSN program or permission of Coordinator. The primary focus of this course is the analysis of healthcare systems. Public and private healthcare delivery systems are examined. Students explore future challenges and processes to improve systems.

NURS 6002 - Advanced Nursing Research

Cross-listing: NRSE 5001.

Cr. 3.

Prerequisite: Admission to the MSN program or permission of Coordinator. Pre- or corequisite: NURS 6000. This course involves the systematic examination and application of the research process. The concept of evidenced-based practice and its application to nursing is critically examined.

NURS 6003 - Advanced Role Development

Cross-listing: NRSE 5006.

Cr. 3.

Prerequisite: Admission to the MSN program. This course provides students with an in-depth understanding of the legal, historical, political, social, and ethical aspects of advanced nursing. Traditional and emerging roles for advanced nursing are examined.

NURS 6021 - APPLICATION OF ADVANCED SKILLS IN ACUTE CARE

Lec. 2 Credit 2.

Prerequisite: NURS 6101, 6102, 6103, 6104, 5604, 5613, 5608, 5614, 5610 & 5617 Corequisite: NURS 5616

Transition into the NP role and the development of advanced practice skills and their integration in the diagnosis and management of acute and chronic clinical problems in acute care settings in adults and older adults.

NURS 6023 - PALLIATIVE/ END OF LIFE CARE AND THE APN

Lec. 2 Credit 2.

Prerequisite: Program Coordinator Approval Applies the concepts of culturally congruent palliative and end-of-life care within the context of the advance practice nurse. Issues associated with families and persons who are severely ill or dying in the health care environment are explored with a focus on the APN (APN) and assessment, management, and evaluation of ethical palliative and EOLC solutions to problems associated with being severely ill and dying.

NURS 6101 - Advanced Health Assessment

Cross-listing: NRSE 5009

Cr. 3.

Prerequisite: Admission to the MSN program. Corequisite: NURS 6102. The focus of this course is on the development of advanced health assessment skills. Emphasis is on the application of acquired diagnostic reasoning skills in the presence of abnormal findings uncovered during the physical exam of individuals across the lifespan.

NURS 6102 - Advanced Health Assessment: Clinical Lab

Cr. 1.

Prerequisite: Admission to the MSN program or permission of coordinator. Corequisite: NURS 6101. This clinical lab course emphasizes the application of advanced assessment techniques to perform focused and comprehensive health assessments of clients across the lifespan. Clinical analysis and synthesis of physical assessment data and diagnostic reasoning skills are developed.

NURS 6103 - Advanced Pathophysiology

Cross-listing: NRSE 5016.

Cr. 3.

Prerequisite: Admission to the MSN program. An in-depth scientific knowledge base relevant to selected pathophysiological states confronted by advanced practice nurses is explored. This course provides a basis for the

foundation of clinical decisions related to selected diagnostic tests and the initiation of therapeutic regimens. Pathophysiology across the lifespan is correlated to clinical diagnoses and management.

NURS 6104 - Advanced Pharmacology

Cross-listing: NRSE 5018.

Cr. 3.

Prerequisite: Admission to the MSN program. This course provides advanced pharmacology and therapeutics used in the treatment of selected health conditions commonly encountered by the advanced practice nurse. Emphasis focuses on the decision making process utilized to prescribe and monitor pharmacotherapeutics appropriate to the client situation.

NURS 6204 - Curriculum Design & Education Theory

Lec. 3. Cr. 3.

Prerequisite: Admission to the MSN Program and NURS 6000. This course introduces the student to traditional and contemporary considerations for curriculum planning and design as applied to nursing education. An emphasis is placed on curriculum designs and explores major research based theories of adult and nursing education. These concepts will be applied to a variety of settings/and or levels of education.

NURS 6205 - Evaluation Methods in Nursing Education

Lec. 2. Cr. 2.

Prerequisite: Admission to the MSN program, NURS 6002. Pre or co-requisite NURS 6204. Analysis of testing, benchmarking, and evaluation methods in the clinical practice of nursing across the classroom, seminar, and electronic formats; includes evaluation methods to insure competency in the clinical area.

NURS 6207 - Clinical Focus Practicum

Cr. 2.

Prerequisite: NURS 6103, 3 credit hour course in selected clinical focus area This practicum experience focuses on the synthesis of previously gained knowledge and skills in the provision of advanced nursing care to individuals, families and communities. Emphasis is placed on management of clients within a clinical focus area.

NURS 6209 - Nursing Education Practicum

Cr. 4.

Prerequisite: All MSN coursework. Corequisite: NURS 6990 This practicum experience is designed to integrate theory in a reality context of the teaching role. Opportunities are provided to participate in all phases of the teaching role, including clinical instruction in an area of specialization, and to experiment with different teaching methods.

NURS 6210 - Innovative Teaching Strategies

Cr. 2.

Prerequisite: NURS 6000, 6001, 6003, 6101, 6103, 6104. This course is designed to introduce students to foundational education concepts, principles, and theories while exploring creative teaching and student learning approaches. Students will examine concepts of learning styles, student engagement, evolving technology, and adult learning.

NURS 6211 - Trends in Healthcare Management

Cr. 2.

This course is designed to equip the student with an overview of advanced nursing knowledge in current trends, best practice guidelines, and available resources related to the care of those with chronic and acute diseases. Consideration will be given to major chronic and acute health problems and the factors that influence care management across the life span.

NURS 6212 - Preparation for Certification

Cr. 1.

All MSN coursework, excluding NURS 6990, NURS 6207, and NURS 6209. This course will provide a survey of various concepts surrounding the certification exam for nurse educators.

NURS 6301 - Nursing Administration I

Cr. 3.

Prerequisite: Admission to the MSN program. Pre- or co-requisites NURS 6000, NURS 6001, NURS 6002, NURS 6003 Comprehensive analysis of concepts required for effective performance of the nurse executive's role in organizations. Management as a function of the total organizational system is evaluated. Organizational designs and interpersonal relationships in the healthcare organization are critiqued.

NURS 6302 - Nursing Administration II

Cr. 3.

Prerequisite: NURS 6301. The primary focus of this course is a synthesis of concepts used for effective performance of the nurse executive's role in organizations. The use of human and financial resources in organizational development is explored.

NURS 6303 - Health Care Finance

Cr. 3.

Prerequisite: NURS 6000 This course will enable you to learn the basics of current finance theory and tools to practice in managing healthcare on a day-to-day basis.

NURS 6304 - Human Resources Management

Cr. 3.

Prerequisite: NURS 6301. Personnel and human resource issues including labor management in nursing and health care settings.

NURS 6305 - Quality Management in Nursing and Health Care

Cr. 3.

Prerequisite: NURS 6301, NURS 6302. This course provides a multidisciplinary background in the science of health care quality management. The history and evolution of the quality movement, theories and thought leaders, current quality of care issues, research and innovations, intervention strategies, and instruments will be covered; as well as an analysis of quality management system models in health care. The student will learn to develop and plan for execution of quality improvement plans and will use a quality indicator assessment program, such as Agency for Healthcare Research and Quality (AHRQ) or National Database for Nursing Quality Indicators (NDNQI), as the framework to develop a paper that identifies quality indicators, their measurements and the nursing interventions to improve the quality measurement. Value based purchasing will be defined and interventions to optimize value based purchasing will be discussed.

NURS 6307 - Nursing Management Practicum

2 Cr. 2.

Prerequisite: NURS 6000, NURS 6001, NURS 6002, NURS 6003, NURS 6301, NURS 6302, NURS 6304. NURS 6305 This practicum experience integrates theory into a reality context of the nurse manager's role. Students will participate in various functions and phases of the nurse manager role. Students, faculty, and preceptors will evaluate the student's strengths and weaknesses related to the skills and competencies of nursing management. Course includes 120 clock hours of clinical time.

NURS 6309 - Nursing Administration Practicum

Cr. 4.

Prerequisite: NURS 6301, NURS 6302, NURS 6303, NURS 6304, NURS 6305. Pre- or co-requisite NURS 6990. This practicum experience is designed to integrate theory in a reality context of the administrator's role. Opportunities are provided to participate in all phases of the executive role in different administrative settings.

NURS 6401 - Introduction to Healthcare Informatics

Cr. 3.

Prerequisite: Digital Literacy. This course is the foundation of informatics study. It provides the theoretical framework for information management within various healthcare settings. Topics will include an overview of healthcare information systems and applications and national healthcare information management initiatives.

NURS 6402 - Health Care Information Systems and Technology Integration

Cr. 3.

Corequisite: Corequisite by instructor/advisor permission only. NURS 6401. This course focuses the healthcare professional on the foundations of information system hardware and software interaction inclusive of the structure and function of networks and the Internet. Strategic planning tactics for technology assessment and integration will prepare students to lead technology integration projects in practice. Additional topics will include computer hardware found in healthcare information systems, interface standards, as well as human-computer interaction, such as ergonomics and workflow analysis.

NURS 6403 - Project Management in Systems Analysis and Design

Cr. 3.

Prerequisite: NURS 6401. This course will explore the project management concepts and skills related to the analysis and design of information systems. Topics will include project management, systems lifecycle and solution design, vendor and system selection, and evaluating solutions against strategic objectives.

NURS 6404 - Project Management in System Implementation and Evaluation

Cr. 3.

Prerequisite: NURS 6403. This course will explore the project management concepts and skills related to the implementation and evaluation of information systems. Topics will include project management, systems testing, implementation strategies, and solution valuation.

NURS 6406 - Health Care Data Analysis and Evidence-Based Practice

Cr. 3.

Prerequisite: MS NURS 6002 and NURS 6402; MPS Prerequisite STAT 5140 and NURS 6402. This course presents the concepts related to complex data analysis within the healthcare environment and will focus on healthcare practice

outcomes for quality improvement. Principles of data collection, organization, statistical analysis and interpretation will be presented. Students will use data analysis as a tool for problem identification and data mining.

NURS 6407 - Informatics Applications I

Cr. 2.

Prerequisite: NURS 6402. This applications course integrates informatics concepts with tools used in healthcare informatics practice. Topics include database design, concept mapping, workflow analysis, and solution modeling.

NURS 6409 - Informatics Applications II

Cr. 2.

Prerequisite: NURS 6404. This applications course integrates further informatics concepts with tools used in healthcare informatics practice. Topics include web applications, website and media design, and data presentation.

NURS 6410 - Informatics Practicum

Cr. 4.

This practicum provides students with the opportunity to gain informatics-related experiences in the healthcare setting. Students will complete a minimum of 200 hours in the clinical setting functioning under the supervision of an informatics professional. Specific learning objectives will be developed based upon the clinical placement. Students will be eligible to write the ANCC certification exam following this practicum course.

NURS 6501 - Advanced Adult Health Nursing I

Cr. 3.

Prerequisite: NURS 6000. This course focuses on the theoretical and conceptual basis for nursing management of the acutely ill client from social, cultural, psychological, physical, spiritual and economic perspectives.

NURS 6503 - Advanced Adult Health Nursing II

Cr. 3.

Prerequisite: NURS 6000, NURS 6103, NURS 6501. This course focuses on the theoretical and conceptual basis for nursing management of clients experiencing chronic illness from social, cultural, psychological, physical, spiritual, and economic perspectives.

NURS 6505 - Advanced Adult Health Nursing

Lec. 3. Cr. 3.

Prerequisite: Admission to MSN program. Pre- or co-requisites: NURS 6101, NURS 6102, NURS 6103, and NURS 6104. This course focuses on the theoretical and conceptual basis of the advanced practice nurse role in the delivery of care to adult populations experiencing acute and chronic illness from a social, cultural, psychological, physical, spiritual, and economic perspective.

NURS 6511 - Psychiatric Nursing Care I

Cr. 3.

Prerequisite: NURS 6103. This course will provide a foundation in the specialty care of individuals and families experiencing a psychiatric disorder.

NURS 6513 - Psychiatric Nursing Care II

Cr. 3.

Prerequisite: NURS 6103. This course provides students with a conceptual theory-base for implementing advanced practice psychiatric nursing psychotherapy interventions.

NURS 6515 - Advanced Psychiatric/Mental Health Nursing

Lec. 3. Cr. 3.

Prerequisite: Admission to the MSN program. Pre- or co-requisites: NURS 6101, NURS 6102, NURS 6103, and NURS 6104. This course focuses on advanced principles and concepts related to mental health nursing. The course emphasizes the roles and functions of the advanced practice nurse in meeting the needs of individuals/families/groups/communities who are experiencing alterations in psychosocial functioning. It includes management strategies from the domains of nursing, medicine and pharmacological therapeutics. Evidence-based practices, research, culture diversity, ethics and legal issues are integrated into this course.

NURS 6522 - Core Concepts in Critical Care I

Cr. 3.

Prerequisite: NURS 6103. This course focuses on advanced concepts of critical care related to multiorgan/ system function and dysfunction. Nursing care relating to physiology, assessment, pathophysiology, system failure, and clinical management of the cardiovascular system, pulmonary system, renal system, and endocrine system are addressed. Core concepts of complex pathophysiology, current treatment modalities, and advanced nursing roles are integrated in discussions of providing care to critically ill patients.

NURS 6523 - Core Concepts in Critical Care II

Cr. 3.

Prerequisite: NURS 6103. This course focuses on advanced concepts of critical care related to multi organ/system function and dysfunction. Nursing care relating to physiology, assessment, pathophysiology, system failure, and clinical management of the defense systems (infection, sepsis, organ/bone marrow transplant), shock, trauma, neurological system, hepatic system and gastrointestinal systems are addressed. Integrative core concepts with more complex pathophysiology and advanced treatment modalities of advanced nursing care are integrated to provide care to critically ill patients.

NURS 6525 - Advanced Critical Care Nursing

Lec. 3. Cr. 3.

Prerequisite: Admission to the MSN program. Pre- or co-requisites: NURS 6101, NURS 6102, NURS 6103, NURS 6104. This course focuses on advanced concepts related to multi-organ/system function and dysfunction. Physiology, assessment, pathophysiology, system failure, and clinical management of major body systems are addressed.

NURS 6541 - Women's Health and Perinatal Nursing I

Cr. 3.

Prerequisite: NURS 6103. This course focuses on evidence-based care of the women experiencing common health alterations and developmental transitions. Nursing strategies will include health promotion, prevention of disease, maintenance, and restoration.

NURS 6543 - Women's Health and Perinatal Nursing II

Cr. 3.

Prerequisite: NURS 6103, NURS 6541. This course focuses on evidence-based management and care of the pre-

gestational, antepartum, intrapartum, and the puerperium woman. Focus will include selected alterations of pregnancy. In addition, management and care of the adaptive transitional stages of the newborn and parenting education are explored.

NURS 6545 - Advanced Women's Health & Perinatal Nursing

Lec. 3. Cr. 3.

Prerequisite: Admission to the MSN program. Pre- or co-requisites: NURS 6101, NURS 6102, NURS 6103, and NURS 6104. This course focuses on the care of women's health issues and the pre, peri, and post natal care of both mother and newborn. Nursing strategies for illness prevention, health promotion, and clinical management of both acute and chronic conditions are addressed.

NURS 6601 - Family Nurse Practitioner I

Cr. 3.

Prerequisite: NURS 6101, NURS 6102, NURS 6103, NURS 6104. Corequisite: NURS 6602. This course focuses on advanced practice nursing and health care management of women in diverse populations. Course content includes bio-psychosocial interactions, affecting women throughout the lifespan.

NURS 6602 - Family Nurse Practitioner I - Clinical

Cr. 2.

Prerequisite: NURS 6101, NURS 6102, NURS 6103, NURS 6104. Corequisite: NURS 6601. The focus of this clinical course is delivery of advanced nursing care to women. Various clinical settings with diverse populations will be employed for clinical practice.

NURS 6603 - Family Nurse Practitioner II

Cr. 3.

Prerequisite: NURS 6101, NURS 6102, NURS 6103, NURS 6104. Corequisite: NURS 6604. This course focuses on advanced practice nursing and healthcare management of adults and older adults in diverse populations. Course content includes developmental, physiological, pathological, and psychosocial changes relative to health maintenance, acute and chronic illnesses and life transitions.

NURS 6604 - Family Nurse Practitioner II - Clinical

Cr. 4.

Prerequisite: NURS 6101, NURS 6102, NURS 6103, NURS 6104. Corequisite: NURS 6603. This clinical course is designed to provide the student with opportunities to deliver advanced nursing care to adults and older adults. The student is expected to complete health assessments of adults and older adults and develop comprehensive plans of care.

NURS 6605 - Family Nurse Practitioner III

Cr. 3.

Prerequisite: NURS 6101, NURS 6102, NURS 6103, NURS 6104. Corequisite: NURS 6606. The focus of this course is on advanced nursing and healthcare management of children and adolescents. Course content includes developmental, physiological, pathological, and psychosocial changes relative to health maintenance, acute and chronic illnesses, and developmental transitions within the family context.

NURS 6606 - Family Nurse Practitioner III - Clinical

Cr. 2.

Prerequisite: NURS 6101, NURS 6102, NURS 6103, NURS 6104. Corequisite: NURS 6605. This clinical course is designed to provide the student with opportunities to deliver advanced nursing care to children and adolescents in families and communities. In collaboration with nursing faculty and clinical preceptors various primary care settings will be employed for clinical practice.

NURS 6609 - Advanced Family Nurse Practitioner Practicum

Cr. 4.

Prerequisite: NURS 6000, NURS 6101, NURS 6102, NURS 6103, NURS 6104, NURS 6605, NURS 6606. This practicum experience focuses on the synthesis of previously gained knowledge and skills in the provision of advanced nursing care to individuals, families and communities. Emphasis is placed on health promotion, disease prevention and clinical management of clients with common acute and chronic illness.

NURS 6610 - Adult Health Primary Care I

Lec. 3. Cr. 3.

Prerequisite: NURS 6104; NURS 5009/6101; NURS 6102; NURS 6103. Corequisite: NURS 6611. This course focuses on care of young and middle adults through primary and secondary prevention, diagnosis and treatment of common clinical problems using evidence in primary care settings including developmental, physiological, pathological and psychosocial changes relative to health maintenance in both acute and chronic illnesses.

NURS 6611 - Adult Health Primary Care I Practicum

Lab 3. Cr. 3.

Prerequisite: NURS 6104; NURS 5009/6101; NURS 6102; NURS 6103. Corequisite: NURS 6610. This course focuses on care of young and middle-aged adults in underserved, rural, and urban populations, and is designed to provide opportunities to apply theoretical and/or scientific knowledge to health promotion, diagnosis and management. Students will apply their knowledge of advanced assessment, pathophysiology, and evidence-based practice in a clinical setting.

NURS 6612 - Adult Health Primary Care II

Lec. 3. Cr. 3.

Prerequisite: NURS 6104; NURS 5009/6101; NURS 6102; NURS 6103, NURS 6610/6611. Corequisite: NURS 6613. This course focuses on care of older adults through primary and secondary prevention, diagnosis and treatment of common clinical problems using evidence in primary care settings including developmental, physiological, pathological and psychosocial changes relative to health maintenance in both acute and chronic illnesses. This course places emphasis on the geriatric population.

NURS 6613 - Adult Health Primary Care II Practicum

Lab 3. Cr. 3.

Prerequisite: NURS 6104; NURS 5009/6101; NURS 6102; NURS 6103; NURS 6610/6611. Corequisite: NURS 6612. This course focuses on care of older adults, including the underserved, rural, and urban settings emphasizing clinical prevention and the treatment of acute/chronic illness. It is designed to provide opportunities to apply theoretical and/or scientific knowledge to health promotion, diagnosis and management. Students will apply their knowledge of advanced assessment, pathophysiology, and evidence-based practice in a clinical setting.

NURS 6614 - Primary Care Pediatrics & Women's Health

Lec. 3. Cr. 3.

Prerequisite: NURS 6104; NURS 5009/6101; NURS 6102; NURS 6103; NURS 6610/6611. Corequisite: NURS 6615.

This course focuses on care of women during developmental transitions in their overall health and wellness, including family planning and infertility issues, as well as pregnancy and menopausal issues. This course also focuses on advanced nursing and healthcare management of children and adolescents. Course content includes developmental, physiological, pathological, and psychosocial changes relative to health maintenance, acute and chronic illnesses, and developmental transitions within the family context.

NURS 6615 - Primary Care of the Family: Practicum

Lec. 3. Credit 3.

Prerequisite: NURS 6104; NURS 5009/6101; NURS 6102; NURS 6103; NURS 6610/6611. Corequisite: NURS 6614.

This course addresses primary health care needs of the entire family with a focus on children, adolescents, and women in rural, urban and underserved populations. Strategies for prevention, health promotion, and clinical management of both acute and chronic health concerns are examined across the lifespan of the client and family health populations.

NURS 6616 - Final FNP Preceptorship

Lab 3. Cr. 3.

Prerequisite: NURS 6104; NURS 5009/6101; NURS 6102; NURS 6103; NURS 6610/6611; NURS 6612/6613; NURS 6614/6615. This course focuses on the integration of previously gained knowledge and skills in the care of individuals, families, and communities, including the underserved, rural, and urban settings emphasizing clinical prevention and the treatment of acute/chronic illness. It is designed to provide opportunities to apply theoretical and/or scientific knowledge to health promotion, diagnosis and management.

NURS 6631 - Pediatric Nursing I

Cr. 3.

Prerequisite: NURS 6000, NURS 6101, NURS 6102. This course focuses on health maintenance and health promotion for well children and their families.

NURS 6633 - Pediatric Nursing II

Cr. 3.

Prerequisite: NURS 6000, NURS 6101, NURS 6102. This course is designed to provide the advanced practice nurse with the necessary knowledge base to provide care for children and their families experiencing minor acute illness and chronic illness/disabilities. Content will emphasize common minor acute illnesses and chronic illness/disabilities typically seen in the ambulatory clinic site.

NURS 6635 - Advanced Pediatric Nursing

Cross-listing: Admission to the MSN program. Prerequisites: NURS 6101, NURS 6102, NURS 6103, and NURS 6104.

Lec. 3. Cr. 3.

This course focuses on health maintenance and health promotion for children and their families. Care for children and families experiencing both acute and chronic illness/disabilities are addressed.

NURS 6710 - Advanced Family Psychiatric Nursing I

Cr. 3.

Prerequisite: NURS 6101, NURS 6102, NURS 6103, NURS 6104. Corequisite: NURS 6711. This course is the first of

three in the sequence of intervention and case management courses. It provides the foundation for the diagnosis and management of common psychiatric illnesses, behavioral health and developmental problems, and substance use disorders across the lifespan.

NURS 6711 - Advanced Family Psychiatric Nursing I: Practicum

Cr. 3.

Prerequisite: NURS 6101, NURS 6102, NURS 6103, NURS 6104. Corequisite: NURS 6710. This course focuses on care of adults in underserved, rural, and urban populations, and is designed to provide opportunities to apply theoretical and/or scientific knowledge to health promotion, diagnosis and management of identified mental illnesses. Students will apply their knowledge of advanced assessment, pathophysiology, and evidence based practice in a clinical setting.

NURS 6712 - Advanced Family Psychiatric Nursing II

Cr. 3.

Prerequisite: NURS 6101, NURS 6102, NURS 6103, NURS 6104, NURS 6710, NURS 6711. Corequisite: NURS 6713.

This course provides an approach to advance nursing in the specialty care of individuals and families experiencing a psychiatric disorder utilizing different psychiatric health care delivery models.

NURS 6713 - Advanced Family Psychiatric Nursing II: Practicum

Cr. 3.

Prerequisite: NURS 6101, NURS 6102, NURS 6103, NURS 6104, NURS 6710, NURS 6711. Corequisite: NURS 6712. This course focuses on the advance nursing care of individuals and families experiencing a psychiatric disorder. Students will apply their knowledge of advanced assessment, pathophysiology and evidence-based practice in a clinical setting.

NURS 6714 - Advanced Family Psychiatric Nursing III

Cr. 3.

Prerequisite: NURS 6101, NURS 6102, NURS 6103, NURS 6104, NURS 6710, NURS 6711, NURS 6712, NURS 6713. Corequisite: NURS 6715. This course focuses on management of common psychiatric illnesses in both adults and children.

NURS 6715 - Advanced Family Psychiatric Nursing III: Practicum

Cr. 3.

Prerequisite: NURS 6101, NURS 6102, NURS 6103, NURS 6104, NURS 6710, NURS 6711, NURS 6712, NURS 6713. Corequisite: NURS 6714. This course incorporates psychotherapeutic and psychopharmacological intervention in the identification and management of complex psychiatric/mental health issues for diverse clients across the lifespan. Students will apply their knowledge of advanced assessment, pathophysiology and evidence-based practice in a clinical setting. 140 Direct Patient Contact Hours.

NURS 6716 - Final Psychiatric Nursing Preceptorship

Cr. 3.

Prerequisite: NURS 6101, NURS 6102, NURS 6103, NURS 6104, NURS 6710, NURS 6711, NURS 6712, NURS 6713, NURS 6714, NURS 6715. This course builds on and synthesizes knowledge gained in the previous semesters.

Psychotherapeutic and psychopharmacological interventions are integrated in the identification and management of complex psychiatric/mental health issues for diverse clients across the lifespan.

NURS 6910 - Role Transition to Certification and Practice

Lec. 2. Cr. 2

Prerequisite: NURS 6104; NURS 5009/6101; NURS 6102; NURS 6103; NURS 6610/6611; NURS 6612/6613; NURS 6614/6615. The primary goal of this course is to prepare the FNP student for the AANP or ANCC Certification exam. Topics such as test plan and format, registration process, test taking strategies, and post exam procedures are addressed. Students will explore common primary care diagnoses tested on the certification exams and take standardized tests to identify areas of weakness. All students will submit a post-graduation preparation plan that is approved by the instructors.

NURS 6911 - Role Transition to Certification and Practice for the Psychiatric Mental Health Nursing Practitioner

Cr. 2.

Prerequisite: NURS 6101, NURS 6102, NURS 6103, NURS 6104, NURS 6710, NURS 6711, NURS 6712, NURS 6713, NURS 6714, NURS 6715. The primary goal of this course is to prepare the PMHNP student for the ANCC Certification exam. Topics such as test plan and format, registration process, test taking strategies, and post exam procedures are addressed. Students will explore common psychiatric mental health diagnoses tested on certification exams and take standardized tests to identify areas of weakness. All students will submit a post-graduation preparation plan that is approved by the instructors.

NURS 6990 - Scholarly Synthesis

Cr. 3.

Prerequisite: All MSN coursework Corequisite: Based on area of concentration NURS 6209 or NURS 6309 As a culminating experience, this course provides the student with the opportunity to synthesize knowledge in the major or concentration area of study.

Nursing Practice (DNP)

These are classes for the new joint DNP degree program with ETSU, NRSE classes.

NRSE 5000 - Conceptual Systems for Advanced Nursing Practice

Lec. 2. Cr. 3.

The philosophical dimensions of the processes of ways of knowing and conceptualization which are linked to research and practice are introduced. Analysis and evaluation of nursing and related concepts, theories, and models are correlated with theory development, research, and practice.

NRSE 5001 - Nursing Research for Evidence-Based Practice

Cross-listing: NURS 6002.

Lec. 3. Cr. 3.

This course provides DNP students with an understanding of the methodology of research in nursing, evaluation of research design and the critical appraisal of the results of research. Application to clinical problems is central to the course.

NRSE 5006 - Advanced Role Development

Cross-listing: NURS 6003.

Cr. 3.

Explore, analyze, and evaluate issues in nursing and other discipline relevant to clinical practice, administration, education, and research issues. Discussion will focus on issues generated by role conflict and ambiguities in practice. Topics promoting the development of negotiation, entrepreneurial, contract development, and financial management skills are addressed in relation to roles of advanced nursing.

NRSE 5009 - Health Assessment Throughout the Lifespan

Cross-listing: NURS 5009

Lec. 3. Cr. 3.

Advanced health assessment focuses on the assessment of the total health status of individual and family clients throughout the life span. Emphasis is placed on the decision-making processes to differentiate normal from abnormal health status. Content includes predictable pathological findings and the mechanisms underlying them.

NRSE 5010 - Health Assessment Throughout the Lifespan Practicum

Lec. 3. Cr. 3.

This practicum provides the student with opportunities to conduct advanced health assessment focusing on the assessment of the total health status of individual and family clients throughout the life span. Emphasis is placed on the decision-making processes which differentiate normal from abnormal health status. The practicum includes extensive laboratory practice and clinical placements.

NRSE 5011 - Health Promotion, Diagnosis, Treatment, and Clinical Management: Nurse Practitioner I

Lec. 3. Cr. 3.

Prerequisite: NRSE 5009, NRSE 5010, NRSE 5016, NRSE 5018. This course focuses on advanced nursing care of young and middle age adults through primary and secondary prevention, diagnosis and treatment of common clinical problems using evidence in primary care settings.

NRSE 5012 - Health Promotion, Diagnosis, Treatment, and Clinical Management: Nurse Practitioner I Practicum

Lec. 3. Cr. 3.

Prerequisite: NRSE 5009, NRSE 5010, NRSE 5016, NRSE 5018. Corequisite: NRSE 5011. This course is designed to provide opportunities to apply theoretical and/or scientific knowledge to health promotion, diagnosis and management of common clinical problems in individuals and families across the lifespan in underserved, rural, and urban populations.

Notes: Enrollment is restricted to the College of Nursing students.

NRSE 5013 - Health Promotion, Diagnosis, Treatment, and Clinical Management: Nurse Practitioner II

Lec. 3. Cr. 3.

Prerequisite: NRSE 5000, NRSE 5009, NRSE 5010, NRSE 5011, NRSE 5012, NRSE 5016, NRSE 5018.

Corequisite: NRSE 5014 This course provides the nurse practitioner student with knowledge of health promotion, diagnosis and management of chronic illness of individuals and families across the lifespan as well as the recognition and management of those with complex and multiple chronic conditions.

Notes: Enrollment is restricted to the College of Nursing students.

NRSE 5014 - Health Promotion, Diagnosis, & Clinical Management of Older Adults Practicum

Lec. 3. Cr. 3.

This course is designed to provide opportunities to deliver advanced nursing care to older adults, including the underserved, in rural and urban settings emphasizing clinical prevention and the treatment of acute/chronic illness.

NRSE 5016 - Advanced Pathophysiology

Cross-listing: NURS 6103.

Lec. 3. Cr. 3.

The focus is on alterations in biological processes which affect the body's dynamic equilibrium and a conceptual approach that is designed to integrate knowledge from the basic and clinical sciences. Alterations at the cellular and organ level are presented. These alterations include metabolic, infectious, immunologic, degenerative, and neoplastic processes.

NRSE 5018 - Advanced Clinical Pharmacology

Cross-listing: NURS 6104.

Lec. 3. Cr. 3.

The philosophical dimensions of the processes of ways of knowing and conceptualization which are linked to research and practice are introduced. Analysis and evaluation of nursing and related concepts, theories, and models are correlated with theory development, research, and practice.

NRSE 5021 - Lifespan Assessment and Clinical Management: Women's Health

Lec. 2. Cr. 2.

This course focuses on the current and evolving role of the professional in case management in the managed care environment. Dimensions of the case management role will be examined through online discussion and oral and written presentation. Students will have the opportunity to explore the process of case management from a variety of theoretical perspectives, understand the practical aspects of case management as well as the emerging trends in health care delivery.

NRSE 5022 - Lifespan Assessment and Clinical Management: Women's Health Practicum

Lec. 3. Cr. 3.

The focus of this practicum is delivery of advanced nursing care to women. Various clinical settings with underserved, rural, and urban populations will be employed for clinical practice. The role of an advanced nurse generalist in case management is undertaken by the student, in collaboration with nursing faculty and clinical preceptors. The student will provide care, coordinate services, and collaborate with others as appropriate.

NRSE 5023 - Health Promotion and Clinical Management of Children and Adolescents

Lec. 3. Cr. 3.

This course focuses on the delivery of advanced practice nursing care to children and adolescents in rural, urban, and underserved populations.

NRSE 5024 - Health Promotion, Diagnosis and Clinical Management of Children and Adolescents Practicum

Lec. 3. Cr. 3.

Prerequisite: NRSE 2023 This practicum is designed to provide the student with opportunities to deliver advanced nursing care to children and adolescents in families and communities. Various primary care settings, including rural and urban, and underserved populations will be employed for clinical practice. The role of an advanced practice nurse is undertaken by the student in collaboration with nursing faculty and clinical preceptors.

Notes: Enrollment is restricted to the College of Nursing students.

NRSE 5030 - Scholarly Writing

Cr. 1.

This didactic course is designed to provide nursing graduate students with the knowledge and skills to master professional writing. Students focus on the components of academic writing that are required for the development of a dissertation or scholarly project proposal as well as future publications. The development of evidence tables, critical literature reviews and peer review will be covered.

NRSE 5040 - Telehealth for Interprofessional Healthcare

Cr. 3.

This course provides an introduction to telehealth designed for students enrolled in health-related programs or healthcare professionals seeking additional knowledge in telehealth to enhance the provision of quality of care. The course provides an introduction to use of telehealth to improve access to care and to improve patient health outcomes. A special emphasis is placed on interprofessional collaboration and the use of technology-based modalities to optimize healthcare delivery especially to patients in rural and underserved populations.

NRSE 5100 - Principles of Population Health & Data Analysis for Advanced Nursing Practice

Cr. 4.

This course will explore the ever-changing world of population health. Students will explore the role of age, gender, race, genetics, lifestyle, and environmental factors in regards to health and outcomes. Rates, prevalence and incidence of disease will be examined, and the role of technology in population health will be discussed. Students will use evidence-based research to identify needs of specific populations, and use best practice guidelines to propose ways to address these needs.

NRSE 5301 - Pediatric Variations on Health Assessment & Measurement

Lec. 1. Cr. 1.

Builds on knowledge of advanced practice health assessment skills to assist the advanced practice pediatric nurse in varying health assessment techniques and diagnostic interpretation for the pediatric patient. Developmental, age-appropriate, and opportunistic approaches are emphasized.

NRSE 5302 - Pediatric Pharmacotherapeutics

Lec. 2. Cr. 2.

Builds on knowledge of advanced clinical pharmacology to assist the advanced practice pediatric nurse in application of pharmacotherapeutics specific to the pediatric patient. The impact of pediatric physiology on pharmacotherapeutics and the advanced practice pediatric nurse's role in prescribing safety is emphasized.

NRSE 5303 - Psychopharmacology

Lec. 4. Cr. 4.

Prerequisite: Admission to the master's nursing program or permission of instructor. This course is designed to familiarize health profession students with the basic principles of psychopharmacology and to explore medications used to treat psychiatric disorders. The physiological basis of mental illness will be reviewed and the pharmacologic, pharmacodynamic principles of medications used in mental health care examined.

NRSE 5304 - Health Promotion of the Growing Child

Lec. 3. Cr. 3.

Lifespan growth, behavior, and development from birth to adolescence are examined. Health promotion within the context of lifespan development is emphasized. Psychosocial, family, and attachment theories in relation to child and family health are explored.

NRSE 5305 - Pediatric Primary Care I: Well Child

Lec. 3. Cr. 3.

Health promotion within the context of illness, disease, or injury prevention is examined. The importance of frequent wellness assessments and early intervention in relation to developmental risk and disability is emphasized. The role of the advanced practice pediatric nurse in care of the well child is explored.

NRSE 5306 - Pediatric Primary Care II: Episodic & Minor Acute Illness

Lec. 3. Cr. 3.

The role of the advanced practice pediatric nurse in care of the child with episodic and minor acute illness is explored. Pathophysiology, epidemiology, risk factors, screening and diagnostic tests, management, and patient education around episodic and minor acute illness is emphasized.

NRSE 5307 - Pediatric Primary Care III: Chronic Illness, Disability, & Complex Conditions

Lec. 2. Cr. 2.

The role of the advanced practice pediatric nurse in care of the child with chronic illness, disability, and complex conditions is explored. Pathophysiology, epidemiology, risk factors, screening and diagnostics, management and patient education around chronic illness, disability, and complex conditions is examined. The importance of continuity of care is emphasized.

NRSE 5308 - Contemporary Issues in School-Age & Adolescent Health Care

Lec. 2. Cr. 2.

Current and contemporary issues in school-age and adolescent health care are addressed. The impact of environment, peer dynamic, psychosocial, and biophysical changes on these age groups is emphasized.

NRSE 5309 - Pediatric Behavioral & Mental Health Issues

Lec. 2. Cr. 2.

Common pediatric behavioral and mental health issues are examined. Integrative management approaches are identified and evaluated. Models and systems of pediatric behavioral and mental health care are explored.

NRSE 5310 - The Abused or Neglected Child

Lec. 2. Cr. 2.

Using a case-based approach, the abused or neglected child is discussed. Risk factors for child abuse or child neglect are identified. The short-term and long-term consequences are explored. Legal issues and role of the advanced practice nurse are emphasized.

NRSE 5311 - Advanced Practice Nursing: Pediatric Primary Care Practicum I

Lec. 3. Cr. 3.

Precepted practicum in pediatric primary care. Advanced practice clinical experiences in pediatric health promotion and disease and injury prevention. Management of well-child visits and patient and family education is emphasized.

NRSE 5312 - Advanced Practice Nursing: Pediatric Primary Care Practicum II

Lec. 3. Cr. 3.

Precepted practicum in pediatric primary care. Advanced practice clinical experiences in differential diagnosis and management of episodic and minor acute illnesses are emphasized.

NRSE 5404 - Advanced Family Psychiatric Nursing Care I

Lec. 3. Cr. 3.

This course provides a foundation for the use of diagnostic reasoning and advanced therapeutics in the specialty care of individuals and families experiencing or at risk of experiencing psychiatric disorders.

NRSE 5405 - Advanced Family Psychiatric Nursing Care I Practicum

Lec. 3. Cr. 3.

This course provides a synthesis and application of specific knowledge and the development of advanced clinical judgment in the specialized care of adults and families experiencing a psychiatric disorder or at risk of experiencing a psychiatric disorder.

NRSE 5408 - Advanced Family Psychiatric Nursing Care II

Lec. 3. Cr. 3.

This course will build on foundational knowledge in the use of diagnostic reasoning and advanced therapeutics in the care of special populations, particularly children, adolescents, and geriatric patients, building on the previously acquired foundational knowledge of care of the adult patient.

NRSE 5409 - Advanced Family Psychiatric Nursing Care II Practicum

Lec. 3. Cr. 3.

This course provides the clinical experiences to acquire, synthesize and apply specific knowledge in the specialized care of children, adolescents and geriatric patients experiencing a psychiatric disorder, or at risk for developing a psychiatric disorder.

NRSE 5410 - Interpersonal Treatment Modalities for Advanced Practice Nurse

Lec. 3. Cr. 3.

This course provides students with a conceptual theory-base for implementing advanced practice psychiatric nursing psychotherapy interventions.

NRSE 5411 - Interpersonal Treatment Modalities for Advanced Practice Nurse Practicum

Lec. 3. Cr. 3.

This course provides students clinical experiences in implementing supervised selected therapy interventions for specific patients. The intervention is based on the assessment, diagnosis, and treatment of the patient's mental health condition, congruent with the analysis of the best evidence.

NRSE 5500 - Executive Leadership Practicum

Lec. 1-7. Cr. 1-7.

The executive leadership practicum provides an in-depth, individualized practicum experience with approved nurse administrator preceptors. Each credit = 70 clock hours. (variable credit)

NRSE 5501 - Leadership in Nursing Administration

Lec. 1. Cr. 1.

Leadership theories and concepts are explored, analyzed, and evaluated. The course focuses on personal leadership philosophy and how it impacts organizational members.

NRSE 5502 - Executive Leadership Practicum I

Cr. 3.

Prerequisite: NRSE 5501 and NRSE 5510. This first of three practicums introduces the student to the nurse executive role through collaboration with a nurse administrator preceptor.

NRSE 5503 - Executive Leadership Practicum II

Cr. 3.

Prerequisite: NRSE 5501, NRSE 5502, and NRSE 5510. This second practicum continues to explore the role of the nurse executive while strengthening nursing leadership skills.

NRSE 5504 - Executive Leadership Practicum III

Cr. 3.

Prerequisite: NRSE 5501, NRSE 5502, NRSE 5503, and NRSE 5510.

This third practicum of three provides an opportunity for the student to integrate leadership skills and best practice guidelines to improve organizational effectiveness and patient outcomes.

NRSE 5510 - Organizational Theory and Nursing Administration

Lec. 3. Cr. 3.

Analyzes organizational theory and the role of the nurse administrator. Examines alternative forms of organizational structure, organizational culture, design parameters, and forces for and against change.

NRSE 5520 - Fiscal Management in Nursing Administration

Lec. 3. Cr. 3.

Examines management of fiscal resources in nursing service settings.

NRSE 5530 - Health Care Organizations & Law

Lec. 3. Cr. 3.

Prerequisite: Permission of instructor. This interdisciplinary course is part of the Health Care Management Certificate Program that is totally online. The focus of the course is to provide an overview of the role of law in the health care system for health care administration.

NRSE 5550 - Human Resource Management in Health Organizations

Lec. 3. Cr. 3.

This course focuses on the skills and concepts required in managing people in health service organizations, as well as on the human resource implications of changes in the external environment. Emphasis will be placed on the technical aspects of human resource management as well as the managerial skills required to manage people.

NRSE 5560 - Nursing Administration Practicum I

Lec. 3. Cr. 3.

This first capstone course provides in-depth practicum experiences with approved preceptors in nursing administrative role similar to those in which students will practice following program completion.

NRSE 5570 - Nursing Administration Practicum II

Lec. 3. Cr. 3.

This second capstone course provides in-depth practicum experiences with approved preceptors in nurse administrator roles similar to those in which students will practice following program completion. Students will complete a project and will analyze nursing administration and leadership roles.

NRSE 5580 - Project Management of Nurse Leaders

Lec. 3. Cr. 3.

This course focuses on all major aspects and components of project management. Processes include assessing, initiating, planning, executing, controlling, and closing.

NRSE 5604 - Advanced Pathophysiology & Clinical Reasoning for Acute Disease Management I

Lec. 3. Cr. 3.

This course focuses on developing knowledge and using evidence-based practice concepts on the integration of pathophysiological and advanced assessment findings needed to delineate diagnoses and in management of complex acute and chronic clinical problems in hospitalized adults.

NRSE 5608 - Advanced Pathophysiology & Clinical Reasoning for Acute Disease Management II

Lec. 3. Cr. 3.

This course provides in-depth study of complex disease processes to diagnose and manage acute and chronic clinical problems in critically ill adults using current evidence.

NRSE 5610 - Diagnostic Interpretation and Therapeutic Modalities

Cr. 3.

Prerequisite: Graduate Status. Builds on advanced assessment skills to incorporate diagnostic testing and current therapies to provide complex care for adults with complex acute, chronic and critical conditions.

NRSE 5610 (6610) - The Illness Experience

Lec. 3. Cr. 3.

This course examines the illness experience from the perspective of the patient. Particular emphasis is placed on distinguishing illness from disease and the role of narrative in enhancing healing relationships and environments.

NRSE 5701 - Pharmacology for Women's Health

Lec. 2. Cr. 2.

Application of advanced pharmacological concepts to address the health needs of the female client across the life span.

NRSE 5702 - Women's Health for Advanced Practice I: GYN

Lec. 3. Cr. 3.

Knowledge development and integration of advanced care concepts utilizing evidence-based concepts in the diagnosis and management of the gynecological client across the life span.

NRSE 5710 - Primary Care in Women's Health

Lec. 3. Cr. 3.

Integration of pathophysiology, assessment, and diagnosis in the management of common primary health care needs of women.

NRSE 5900 - Independent Study in Nursing

Prerequisite: Admission to the DNP program and consent of instructor. Advanced study on an individual basis focusing on an area/topic related to nursing.

NRSE 6002 - Health Policy Leadership

Lec. 3. Cr. 3.

This course is designed to help students develop skill in analyzing health policy development, evaluating current health policy, and providing leadership to influence health policy at various governmental levels. A special focus on rural health policy is included.

NRSE 6004 - Advanced Quality Management

Lec. 3. Cr. 3.

This course prepares nurse leaders to direct complex health care systems within a customer-focused, ethical framework using advanced quality management skills.

* This course will not be offered after Fall 2020.

NRSE 6014 - Measurement of Clinical Outcomes

Lec. 3. Cr. 3.

This course is designed to help students develop skills in systematic evaluation, and development of clinical outcome measures in order to improve health.

* This course will not be offered after Fall 2020.

NRSE 6019 - Collaborative Approaches to Practice

Lec. 3. Cr. 3.

This course is designed to help the student understand the collaborative process, to develop skills in analyzing the

politics of collaboration, and to evaluate related theoretical frameworks in order to provide leadership in the development of collaborative relationships.

* This course will not be offered after Fall 2020.

NRSE 6050 - Quality/Translation

Lec. 3. Cr. 3.

Prerequisite: NRSE 5001 This course is designed to provide DNP students with theoretical and applied knowledge in the translation of nursing science into practice with the goal of improving the outcomes, quality, efficiency and cost effectiveness of care.

NRSE 6210 - Development of DNP Practice in Women's Health

Lec. 3. Cr. 3.

Role transition and practice development in both the independent and collaborative practice setting.

NRSE 6211 - Advanced Nursing Care of the Vulnerable Woman

Lec. 3. Cr. 3.

Identification of vulnerability and incorporation of best practices in women's health to meet the special needs of vulnerable women.

NRSE 6213 - Integrative Approaches to Women's Health

Lec. 3. Cr. 3.

Integration of complementary and holistic care in women's health across the lifespan.

NRSE 6311 - Advanced Family System Assessment and Evaluation

Lec. 3. Cr. 3.

This course focuses on child health in the context of the family system. Building on knowledge of family system theory, the role of the advanced practice pediatric nurse in family health promotion is explored. Advanced family assessment skills are utilized to identify family system issues as barriers to optimal child health.

NRSE 6317 - Integrated Applications of Leadership & Pediatric Healthcare Delivery

Lec. 4. Cr. 3.

Prerequisite: NRSE 5315, 5305, 5306, 5316, 5311, 5312, 5317 and successful DNP Proposal Defense This course focuses on the role of the advanced practice pediatric nurse in the larger context of pediatric healthcare delivery models of service. Complexity science and other relevant leadership theories in context of DNP leadership development are explored. Leadership and its impact on interprofessional collaboration to influence pediatric health outcomes and complex healthcare delivery is emphasized.

NRSE 6400 - Improving Mental Health Outcomes in Primary Care

Lec. 3. Cr. 3.

Prerequisite: Admission to the Graduate Nursing Program. This course provides advanced practice nurses with the necessary knowledge base to provide care for adults and their families experiencing mental health problems encountered in the primary care setting.

NRSE 6412 - Clinical Prevention in Mental Health Services

Lec. 3. Cr. 3.

This course will focus on theoretical foundations in mental health promotion, mental illness prevention and maintenance of function across the health-illness continuum with the individual, family, and community.

NRSE 6413 - Advanced Communication Skills

Lec. 3. Cr. 3.

This course focuses on the theory, techniques, and application of communication skills for advanced communication skills of groups to improve mental health outcomes.

NRSE 6414 - Neurobiology Psychiatric Disorder

Lec. 3. Cr. 3.

This course will provide essential neurobiology of psychiatric disorders for the Psychiatric Mental Health Nurse Practitioner. The structural, biochemical, and molecular mechanisms of the normal nervous system in relationship to neuropsychiatric dysfunction and neurodegeneration will be emphasized.

NRSE 6415 - Mental Health Care Delivery Systems

Lec. 3. Cr. 3.

This course focuses on the role of the advanced practice psychiatric nurse in the larger context of mental health care by examining models of service delivery regionally, nationally and internationally.

NRSE 6513 - Case Management

Lec. 3. Cr. 3.

Prerequisite: Graduate status or permission of instructor. This course focuses on the current and evolving role of the professional in case management and in the managed care environment. Dimensions of the case management role will be explored through class discussion, oral and written presentation, and expert testimony. Students will have the opportunity to explore the process of case management from a variety of theoretical perspectives, and they also will have the opportunity to examine emerging trends.

NRSE 6612 - Principles of Nurse Practitioner Practice

Lec. 3. Cr. 3.

The establishment, maintenance and evaluation of a nurse practitioner practice will be discussed.

NRSE 6613 - Advanced Nursing of Rural/Underserved Populations

Lec. 3. Cr. 3.

This course examines the relationship between pathophysiologic processes and complex disease states across the life span, with special attention to conditions and areas of health disparities common to rural and underserved populations.

NRSE 6614 - Advanced Intervention DNP Practice

Lec. 3. Cr. 3.

This internship experience focuses on the synthesis of previously gained knowledge and skills to provide advanced nursing care for individuals, families and communities. Emphasis is placed on health

promotion, disease prevention and clinical management of clients with common acute and chronic illness in primary care settings.

NRSE 6711 - Health Care Informatics and Technology

Lec. 3. Cr. 3.

This course covers applications of informatics and technology in individual health care, for health care providers, and within health care systems.

* This course will not be offered after Fall 2020.

NRSE 6712 - Strategic Fiscal Management

Lec. 3. Cr. 3.

This course examines strategic fiscal management in nursing service settings with an emphasis on balancing fiscal accountability with quality.

NRSE 6713 - Systems Management

Lec. 3. Cr. 3.

This course focuses on the role of the nurse administrator/executive in systematic management within complex organizations. Management is viewed from a systems approach.

NRSE 6714 - Executive Leadership

Lec. 3. Cr. 3.

This course focuses on current and emerging theories impacting the role of the nurse administrator/executive at an aggregate/systems/organizational level.

NRSE 6715 - Contemporary Problems in Executive Leadership in Nursing

Lec. 3. Cr. 3.

Prerequisite: Admission to the DNP program. This course examines contemporary problems and opportunities in executive leadership for the DNP at the aggregate/systems/organization level.

NRSE 6800 - DNP Residency Internship

Lec. 1-7. Cr. 1-7.

This course is a practicum immersion where students integrate and synthesize the essentials and specialty requirements necessary to demonstrate competency in an area of specialized nursing practice. Includes at least 500 hours of supervised practice-related experiences.

* This course will not be offered after Fall 2020.

NRSE 6801 - Residency I DNP Project Identification

Cr. 3.

Prerequisite: Admission into the DNP program or permission of instructor. This course is a practicum immersion where students integrate and synthesize the essentials and specialty requirements necessary to demonstrate

competency in an area of specialized nursing practice. This course includes at least 40 hours of supervised practice-related experiences.

NRSE 6802 - DNP Project Development

Cr. 3.

Prerequisite: Admission into the DNP program and completion of Residency I. This course is a practicum immersion where students integrate and synthesize the essentials and specialty requirements necessary to demonstrate competency in an area of specialized nursing practice. This course serves to complete, in part, the 500 hours of supervised practice-related experiences required to complete program of study and prepare for subsequent residency completion courses.

NRSE 6803 - DNP Project Implementation

Cr. 3.

Prerequisite: NRSE 6802. This course is a practicum immersion where students integrate and synthesize the essentials and specialty requirements necessary to demonstrate competency in an area of specialized nursing practice. Includes at least 500 hours of supervised practice-related experiences.

NRSE 6804 - DNP Project Analysis and Dissemination

Cr. 3.

Prerequisite: NRSE 6803. This course is a practicum immersion where students integrate and synthesize the essentials and specialty requirements necessary to demonstrate competency in an area of specialized nursing practice. Includes at least 500 hours of supervised-related experiences.

NRSE 6860 - Capstone

Lec. 3. Cr. 3.

This course provides an opportunity for the student to apply advanced theoretical, policy, and specialty knowledge and skills to a clinical or systems-level problem. It is expected that students will propose a capstone project that will demonstrate advanced levels of systems thinking in designing, delivering and evaluating evidenced-based strategies to influence care provision or system changes and improve outcomes for individuals, groups, or populations.

* This course will not be offered after Fall 2020.

NRSE 6950 - Internship in Advanced Nursing Practice

Lec. 3. Cr. 3.

This internship experience focuses on the synthesis of previously gained knowledge and skills to provide advanced nursing care for individuals, families and communities. Emphasis is placed on health promotion, disease prevention and clinical management of clients with common acute and chronic illness in psychiatric care settings.

Physics

PHYS 5900 - Selected Topics in Physics

Cr. 3,6,9.

Topics covered will be chosen on the basis of student interest and need.

Pop Culture

POPC 4010 (5010) - Topics

Lec. 1-3. Cr. 1-3.

Special topics in popular culture. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

POPC 4050 (5050) - Science Fiction and Fantasy

Lec. 3. Cr. 3.

Analysis and discussion of themes, conventions, and stereotypes in short stories, novels, and films. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

POPC 4060 (5060) - Detective Fiction

Lec. 3. Cr. 3.

Private detectives, policemen, spies in fiction. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

Professional Administration

PADM 6310 - Leadership in Organizations

Cr. 3.

This course is structured in survey format in order to inform the student about organizational theories and administrative behavior practices pertinent to organizations in America. The purpose of this course is to familiarize the student with a theoretical base for understanding organizations in America. Furthermore, this course will attempt to instruct the student on how to apply organizational theory to the practice of everyday life experiences within their respective organizations. Students will be expected to display their knowledge of “why” and “how” organizations look and function the way they do in various discussions, presentations, papers, and examinations.

Professional Communications

PC 4850 (5850) - Internship

Cr. 3,6,9,12.

Part-time or full-time employment in a business, industrial, or institutional communications setting, related to student academic and career goals. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

PC 4940 (5940) - Technical Editing

Lec. 3. Cr. 3.

Prerequisite: PC 4970 (5970)/ENGL 4970 (5970) Principles and practices of technical editing. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

PC 4950 (5950) - Topics in Professional and Technical Communication

Cross-listing: ENGL 4950(5950)

L. 3 CR. 3

Prerequisite: ENGL 3250 OR PC 3250. In-depth study of topics relevant to the field of Professional and Technical Communication. Course may be repeated provided the content is different.

PC 4970 (5970) - Professional Communication II

Lec. 3. Cr. 3.

A continuation of PC 3250 with emphasis on more complex reports. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

PC 4990 (5990) - Business and Grant Proposal Writing

Lec. 3. Cr. 3.

Theory and practical experience developing business and grant proposals. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

PC 6030 - Core Issues and Research in Professional and Technical Communication

Lec. 3. Cr. 3.

Focuses on ways social action, political contexts, and participants within workplace environments produce successful communication genres in the fields of Professional and Technical Communication. The course also provides perspectives on current research methodologies and practices.

PC 6040 - Special Topics in Professional and Technical Communication and Industry

Lec. 3. Cr. 3.

Prerequisite: Completed B.A. in English and admission to the English M.A. Program, or permission of the graduate advisor. Focuses on theories, principles, and practices relevant to professional and technical communication industries. Includes research components as well as workplace applications. Course may be repeated twice provided the topic is different.

PC 6050 - The Rhetoric of STEM Professions

Lec. 3. Cr. 3.

Highlights the production of scientific writing, such as engineering, legal, and medical discourses, including social contexts that produce them. Includes instruction in field-specific technical writing documents, formats, and styles, including documentation styles and presentation of research.

Professional Studies

PRST 5100 - Adult Learning

Lec. 3. Cr. 3.

Prerequisite: Graduate status. Exploration of the principles of adult learning and the application of these principles to teaching, training, and personal development.

PRST 6040 - Human Resources Management

Cr. 3.

Analysis of theories, policies, procedures, practices and regulations relevant to attracting, retaining and directing a competent work force. Analysis of the basic personnel function with emphasis on the fact that all managers are "personnel managers." Integration of scientific theory, procedures, instruments, and federal regulations into personnel selections, placement, and security programs.

PRST 6100 - Professional Environment: Issues and Ethics

Cr. 3.

Overview of ethics in general, with practical tools for assessing ethical dimensions of professional life, diagnosing or identifying the moral issues at hand, and then developing reasonable options to address particular moral and ethical issues.

PRST 6105 - Project Planning and Scheduling

Cr. 3.

Contemporary methods used in project planning and scheduling; emphasis on critical path method (CPM) with computer application; solution of actual problems stressed. This graduate level course has a required text that includes a trial version of MS Project software that will be used during the semester. The course is project based.

PRST 6110 - Leadership and Communication

Cr. 3.

This course focuses on leadership as a function of communication behavior. Through discussion, cases and exercises, participants will explore effective communication strategies within an organizational setting. The course will cover team leadership skills, rhetorical sensitivity, charisma and practical suggestions for improving leadership effectiveness.

PRST 6200 - Globalization and the Professions

Cr. 3.

The purpose of this course is to assess the impact of globalization on professional life. The course examines globalization as it relates to commerce, information flow, mass media, government, health care and education.

PRST 6300 - Research Methods

Cr. 3.

The student and application of research methods appropriate to professional studies. The course will provide a general introduction to research methods, as well as providing practical exposure to Problem Statements, Literature Reviews, Writing the Research Proposal, and Organization of the Research Report. Quantitative and Qualitative Research methodologies will be covered.

PRST 6310 - Leadership in Organization

Cr. 3.

Designed to inform the individual about the structure and behavior of actors at all levels of the organization. Through

various exercises such as written assignments and discussion, the student will be able to understand "why" and "how" organizations operate and function under dynamic leadership.

PRST 6320 - Comparative Issues in Higher Education

Lec. 3. Cr. 3.

Beginning Fall 2016:

This course begins with a history of the origins of the university and the development of higher education in the West. The modern higher education setting will then be examined within a comparative framework considering such topics as higher education access, equity, finance, accountability, and leadership. The course will conclude with current issues and trends in Western Europe and the United States, as well as other parts of the developed and developing world.

PRST 6330 - International Issues in Education Policy and Practice

Lec. 3 Cr. 3.

Starting spring 2017:

This course examines the policy and practice of primary and secondary education in select OECD countries as well as the developing world. It will cover issues of pedagogy, professionalism, leadership, finance, accountability, efficiency, and equity. Consideration will be given to the role of international agencies and non-governmental organizations in influencing policy and development. Attention will also be given to such issues as private vs. public provision, corruption, social cohesion, education for immigrants and refugees, and education as a basic human right.

PRST 6400 - Instructional Design for Training and Development

Cr. 3.

PRST 6410 - Evaluation of Learning

Cr. 3.

PRST 6420 - Organizational Needs Analysis

Cr. 3.

PRST 6421 - Strategic Organizational Program Planning and Evaluation

Cr. 3.

Developing a comprehensive understanding of the fundamentals of strategic organizational program planning and evaluation with a focus on relevance of strategic planning, effective and efficient program delivery plans with formative and summative evaluations for intentional learning and practical application in the workplace.

PRST 6430 - Instructional Design for Electronic Training

Cr. 3.

This course will provide an overview of instructional design principles and best practices for implementing online training and professional development. The course will focus on using technology to facilitate development and delivery of training and professional development activities in a synchronous and asynchronous environment. It is designed for training and development specialist involved in support of the organizational mission.

PRST 6440 - Teaching Online

Cr. 3.

Prerequisite: PRST 6430.

PRST 6450 - Computer-based Instruction

Cr. 3.

Prerequisite: PRST 6430 and PRST 6440.

PRST 6470 - Facilitation of Learning

Cr. 3.

PRST 6500 - Foundations of Leadership

Cr. 3.

Students will study leadership from a historical and contemporary perspective. Topics cover historical development, leadership theories, personal assessment, values and ethics, motivation, power, followership, group dynamics, diversity, controversy with civility, change process, and citizenship.

PRST 6530 - Healthcare Systems Economics

Cr. 3.

It is expected that this course will facilitate your understanding of the traditional issues in health economics. This course will improve and broaden your knowledge of healthcare systems economics by exploring historical and current economic principles that guide the healthcare system. You will realize how the economy of our healthcare systems has reached the current status. This realization will be as a result of better understanding the impact of an aging population, the malpractice risk, the role of competition and government regulation, and the incentives used by pharmaceuticals and managed care insurers as they drive the healthcare systems. We will explore the health insurance market and managed care, the market for physicians' services, cost of healthcare in hospitals and other healthcare venues, labor issues, cost effectiveness analysis, equity and efficiency, role of government in the health economy, Medicaid and Medicare, international comparisons, and national health insurance.

PRST 6540 - Health Informatics

Cr. 3.

This course is intended to expose students to the field of health informatics and to give them an understanding in the

history, processes, and application of this field in the healthcare delivery system in the United States. Since health informatics is interdisciplinary, students must have already completed introductory courses in statistics, public health (or related subject), computer programming, and economics. Upon completion of this course, students will have a better understanding of healthcare delivery, the specific areas within health informatics, the application of computer technology in healthcare delivery, and the techniques, methodologies, and tools used in health informatics.

PRST 6550 - Computer Based Decision Modeling for Healthcare Administrators

Cr. 3.

This course will provide an introduction to the principles and practice of decision modeling for financial and operational evaluation in the healthcare industry. Basic business spreadsheet techniques will be used to create models for strong decision support to assist in optimizing business decisions. It will introduce the use of statistical analysis and model development to health administration, healthcare program develop and evaluation, healthcare information management, emphasizing the use of computer technology (specifically MS Excel) across these areas.

PRST 6560 - Biological Sciences for Healthcare Administrators

Cr. 3.

The focus of the course is to provide healthcare administrators with a basic understanding of the pathophysiological principles, as well as drug classes used, in the treatment of common medical diagnoses requiring admission to healthcare facilities.

PRST 6570 - Public Health

Cr. 3.

The focus of this course is to explore the history and impact of public health initiatives in the United States and globally. Students will become familiar with public and private organized measures to prevent disease, promote health, and increase the quality of life among diverse populations. Students will learn to assess and monitor the overall health of populations, and use data to contribute to public health policy.

PRST 6580 - Understanding Mental Health

Lec. 3 Cr. 3

In this course, we will examine the history and impact of mental health on public health. As well as promoting healthy lifestyles, public health works to detect, prevent, and respond to disease. People's mental health has a profound impact on their physical and social well-being, making mental health an essential health issue.

PRST 6600 - Statistical Analysis

Cr. 3.

Prerequisite: PRST 6300. Analytical decision making including statistics, quantitative methods, and other optimization and simulation models.

PRST 6700 - Conflict Management and Negotiation

Cr. 3.

Negotiation and Conflict Management presents negotiation theory—strategies and styles—within an employment context. A different topic will be presented each week. In addition to the theory and exercises presented in class, students practice negotiating with role-playing simulations in threaded discussions and chat. Students also learn how to negotiate in difficult situations, which include abrasiveness, racism, sexism, whistle blowing, and emergencies. The course covers conflict management from two (2) perspectives. From a first party perspective you will be directly engaged. As a third party, you will develop and enhance your skills in helping others deal directly with their conflicts, mediation, investigation, arbitration, and helping the system change as a result of a dispute.

PRST 6710 - Risk Assessment & Prevention

Lec. 3 Cr. 3.

This course provides discussion for risk assessment and vulnerability analysis application to manmade and natural disasters. The course will also review methods for preparing public safety personnel, and the communities they serve, for potential disaster and emergency response.

PRST 6720 - Crisis Response Management

Lec. 3. Cr. 3.

This course will focus response and recovery issues surrounding a natural or manmade crisis/disaster. A focus will be given to NIMS/ICS standards and developing a response plan.

PRST 6721 - Managing Emergency Volunteers

Cr. 3.

This course will focus on the management and benefits of using Internal Volunteer Organization, External Volunteer Organizations, and Spontaneous Volunteers to support an agency's preparedness and increase capacities during crises response incidents, emergencies, or disasters. The course includes an overview of Managing Community donations.

PRST 6730 - Leadership in Public Safety

Lec. 3. Cr. 3.

This course examines the history and development of leadership within public safety organizations. Principles, styles, and theories of leadership, management, and administration are discussed.

PRST 6740 - Diversity in Public Safety

Lec. 3. Cr. 3.

This course examines the impact of diversity, culture, and ethnic origin on public safety response and assessment, and is designed to better prepare individuals to meet the challenge of cultural diversity in organizations. Attention is given to how language, tradition, gender, age, race, education, economic structure, and organizational philosophy interact to create a set of rules for acceptable behaviors in complex organizations and society.

PRST 6750 - Preparedness and Mitigation

Lec. 3. Cr. 3.

This course is intended to provide a more focused discussion of preparedness and mitigation as it relates to homeland security and emergency management. The course will also address strategic planning based on the policies and procedures for public safety organizations during disaster.

PRST 6751 - Global Terrorism - Pandemics and Epidemics

Cr. 3.

This course provides the various tools needed for public health and public safety agencies to overcome pandemics and epidemics. The students will learn how to identify the differences between pandemics, epidemics, and outbreaks and to overcome these incidents. Throughout this class, they will research various mitigation measures and preparedness efforts related to pandemics/epidemics. Students will learn mitigation strategies to ensure that critical infrastructure and essential work can be functional during a pandemic or epidemic, even if key personnel are unavailable. The course will look at the potential risks of a bioterrorist attack and the ways that bioterrorism might be perpetrated. Students will research acts of bioterrorism and utilize critical thinking skills needed to prevent bioterrorist attacks. Learners will learn the importance of communication and collaboration during an incident, including communicating with the public and those with special needs. An overview of the importance of mapping in pandemics/epidemics and free resources are taught.

PRST 6760 - Funding in Public Safety

Lec. 3. Cr. 3.

This course will provide an overview of fiscal requirements for public safety organizations. This will include budget concerns, payroll, and liability issues, as well as grant acquisition.

PRST 6770 - Computer-Based Decision Modeling

Cr. 3.

Topics covered within the course include basic business spreadsheet modeling, decision support using spreadsheet models, and optimization of business decisions using spreadsheet models. Models will be multidisciplinary in nature, stemming from areas such as operations, finance, and management. The contextual interpretation of results and their use in decisions will be emphasized.

PRST 6780 - Intelligence Gathering

Lec. 3. Cr. 3.

This course examines the theoretical and analytical concepts for gathering intelligence. A brief history of gathering and current concerns/trends will also be examined. The course will cover approaches used in public safety agencies including law enforcement, homeland security, and others.

PRST 6781 - Science of Contact Tracing

Cr. 3.

During the COVID-19/SARS-CoV-2, many members of the public learned about contact tracing for the first time. During the pandemic response, we saw the media speak about the many hours of work that were undertaken by

these contact tracers. Relatively few individuals know much about the science of contact tracing. In this course, students will learn the principles of contact tracing, the management of identified cases, and best practices for managing teams of contact tracers. Students will learn the necessary investigative skills needed for contact tracing and various strategies that can be used to jog the memory of an infected patient. Principles are also taught dealing with secretive patients, and even more importantly, the principles of case management for infected patients. Students will also learn the principles of leading a contact tracing team.

PRST 6790-6799 - Special Topics

Lec. 3. Cr. 3.

Prerequisite: Consent of the instructor. Concentration on a special topic in professional studies. Students may take a total of up to 6 hours of Special Topic hours, but no more than 3 hours on a single topic.

PRST 6800 - Organizational Skills and Development

Cr. 3.

Analysis of theory, practice and skills involved in leading organizational change, including: aligning change with the organizational strategy, understanding changes as part of a system, understanding the dynamics of and managing resistance to change, creating a vision to inspire others to become a part of the change process, the use of goal setting, feedback and incentives to promote change, and aligning individual's roles to support change. The course will blend learning from the texts and skill building.

PRST 6810 - Internship

Cr. 3.

Internships offer the student an opportunity to observe and work in a professional setting while gaining valuable 'on the job training'. Internships for the Master of Professional Studies program should fit within the framework of the intern's concentration area (Strategic Leadership, Human Resource Leadership, Training and Development, Healthcare Administration, or Project Management). The intern must complete 150 hours of work to receive three hours of credit.

PRST 6820 - Introduction to Project Management Expectations and Methodology

Lec. 3 Lec. 3

This course is designed to equip the student with the needed background to apply for introductory level roles in project management. Project managers play a key role in leading, planning and implementing critical projects to help their organizations succeed. In this course, students will discover foundational project management terminology and gain a deeper understanding of the role and responsibilities of a project manager.

PRST 6830 - Project Management Processes and Development Strategies

Lec. 3 Cr. 3

The world of project management is changing. Industry no longer relies on a single project management process to complete all project work, instead they use multiple processes all tailored to their needs. This course is designed to take a deep dive view in the world of project management processes leveraged in industries today. At the completion

of the class, students will have a better understanding of the processes to include predictive (Waterfall), adaptive (SCRUM), and hybrid processes.

PRST 6840 - Project Management: Schedule and Finance

Lec. 3 Cr. 3

This course is designed to take a deep approach into both the schedule and financial activities used by project managers today. In this class, students will learn how to both plan and estimate activities to include how to create a schedule baseline, develop a network diagram, estimate activity durations, and develop a schedule and build financial estimates. In addition, students will learn critical terms such as critical path, late start, late finish, early start, and early finish.

PRST 6850 - Project Management: Risk Mitigation, Risk Assessment, and Quality Assurance

Lec. 3 Cr. 3

This course provides an overview of risk mitigation with a focus on project management models, risk assessment including FMEA analysis, and includes a comprehensive introduction to standards organization and their purpose. Course topics will include: (a) continuous risk assessment models, (b) continuous process improvement, (c) LEAN Management principles, and (d) Make or Break Quality assessment. Case studies will be analyzed in each area, and each student will be required to assess and develop mitigation strategies relating to risk and quality management.

PRST 6860 - Project Management: Conflict Management in Projects

Lec. 3 Cr. 3.

Project managers routinely deal with conflict, both from internal and external sources. This course will explore effective conflict resolution strategies within a project management environment. Students will develop conflict resolution skills while addressing scarce resources, lines of authority, team building, conflicting goals and expectations, time lines, and other conflict creating variables.

PRST 6870 - Project Management for IT Professionals

Lec. 3 Cr. 3.

This course provides an overview of strategic project planning and execution in IT delivery and administration with a focus on project management models, tools, planning, analysis, and assessment. This course explores strategies to provide successful oversight of information technology projects that an organization undertakes. Topics include planning, budgeting, executing, leading, troubleshooting, and maintaining IT projects.

PRST 6880 - Project Management for Healthcare Administration

Lec. 3 Cr. 3

This course provides an overview of strategic project planning and execution in healthcare delivery and administration with a focus on project management models, tools, planning, analysis, and assessment. Course topics will include: (a) healthcare strategy development, (b) market structure and product life cycle, (c) business model development and disruptive innovation, (d) stakeholders and organizational goals, and (e) implementing, monitoring,

and evaluating strategies. Case studies will be explored, and each student will be required to develop a strategic project plan on a topic aligned with their healthcare interests.

PRST 6910 - Employment and Human Resources Law

Cr. 3.

PRST 6911 - Constitution and Society

Cr. 3.

This course uses critical thinking skills to study how the constitution impacts society from a historical, legal, and political perspective. A review of the entire Constitution including the Amendments is covered with emphasis on the first three Articles of the Constitution and the First, Second, Fourth, Fifth, Eighth, and Fourteenth Amendments. Also pertinent Supreme Court decisions and other primary and secondary sources are covered in this course. Prior study of the Constitution is not a prerequisite.

PRST 6920 - Diversity in the Workplace

Cr. 3.

PRST 6930 - Compensation and Benefits

Cr. 3.

PRST 6940 - Recruitment, Selection, and Retention

Cr. 3.

PRST 6998 - Professional Project

Cross-listing: COMM 6998

Cr. 3.

The Professional Project is the last requirement for the MPS Degree, serving as the integrative culmination of the program of study. It should be a substantial piece of independent research or a significant professional project that is logically consistent with the theme and content of the program of study. Student's work should demonstrate familiarity with and understanding of a body of professional literature related to a specific topic. The Project should grow out of the program of study and should demonstrate the student's ability to use the knowledge gained from this program of study.

Program Planning and Evaluation

EDUP 7410 - Advanced Program Planning and Evaluation Methods I

Lec. 3. Cr. 3.

Prerequisite: Admission to Doctoral Program. Exploration of program planning and evaluation theories and methods used to evaluate programs and improvement initiatives.

EDUP 7420 - Advanced Program Planning and Evaluation Methods II

Lec. 3. Cr. 3.

Prerequisite: Admission to Doctoral Program. Integration and application of theories, best practices, and contextual knowledge to program planning and evaluation processes.

EDUP 7810 - Supervised Practicum in Program Planning and Evaluation

Cr. 3-9.

Prerequisite: Admission to Doctoral Program. Supervised application of program planning and evaluation theories and practices in a variety of settings.

Psychology

PSY 4050 (5050) - Learning and Cognition

Lec. 3. Cr. 3.

Theory, research, and applications in human learning, memory and cognitive processes. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

PSY 4100 (5100) - Child Psychology

Lec. 3. Cr. 3.

Prerequisite: PSY 2010 and PSY 3200. Hereditary and environmental influence on physical and psychological growth. Cognitive, affective, and language development of infant and child with emphasis on disorders and problems in development. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

PSY 4130 (5130) - Physiological Psychology

Lec. 3. Cr. 3.

Prerequisite: PSY 2010 and 3 additional PSY credits. Biological approach to understanding behavior. Students will focus on the anatomy and physiology of the nervous system in reference to behavior, perception, mental disorders, and drug addiction. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

PSY 4140 (5140) - Health Psychology

Lec. 2. Lab. 2. Cr. 3.

Prerequisite: Minimum grade of C in PSY 3110 or consent of instructor. Biopsychosocial approach to examining how stress, personality, and lifestyle are related to physical health. Students will experientially explore a variety of coping strategies and relaxation techniques geared toward self-assessment and understanding. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

PSY 4150 (5150) - Psychology of Personality

Lec. 3. Cr. 3.

Application of psychological principles to an understanding of personality, development, and interpersonal adjustments. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

PSY 4160 (5160) - Abnormal Psychology

Lec. 3. Cr. 3.

Prerequisite: PSY 2010 and 3 additional PSY credits. Nature of abnormal behavior, etiology, symptomatology and treatment. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

PSY 4200 (5200) - Adolescent Psychology

Lec. 3. Cr. 3.

Origin and principles of behavior with emphasis on educational problems in guiding growth and development of adolescents. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

PSY 4250 (5250) - Introduction to Psychological Testing

Lec. 3. Cr. 3.

Basic concepts in psychological testing; interpreting test scores; types of standardized tests. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

PSY 4300 (5300) - Adult Psychology

Lec. 3. Cr. 3.

Physical, cognitive, and psychological development in young adulthood, middle age, and old age. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

PSY 4320 (5320) - Introduction to Therapeutic Techniques

Lec. 3. Cr. 3.

Prerequisite: PSY 4150 (5150) or consent of instructor. An introduction to various therapeutic techniques including

analytic, nondirective, and broadly based behavioral approaches. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

PSY 4400 (5400) - Psychopharmacology

Lec. 3. Cr. 3.

Prerequisite: Junior standing. Drugs: the interaction between psychological and physiological effects on behavior. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

PSY 4600 (5600) - Data Analytics in Psychology

Lec. 1. Lab. 4. Cr. 3.

Prerequisite: PSY 3010 and PSY 3110 with a B or better. Advanced topics in data analysis, graphing, and interpretation of psychological measures. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

PSY 4800 (5800) - History of Psychology

Lec. 3. Cr. 3.

Theoretical systems, experiments, and personalities in the development of modern psychology. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

PSY 4810 (5810) - Concepts of Gerontology

Lec. 3. Cr. 3.

Prerequisite: PSY 3200 or 3300 or SOC 1010. Physical and psychosocial aging processes. Issues in the care of the senior adult. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

PSY 4903 (5903) - Special Topics

Cr. 3.

Prerequisite: Junior standing or consent of instructor. Concentration on a special topic in psychology. Course may be repeated if topic is different. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

PSY 4913 (5913) - Special Topics

Cr. 3.

Prerequisite: Junior standing or consent of instructor. Concentration on a special topic in psychology. Course may be repeated if topic is different. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

PSY 4920 (5920) - Special Topics

Cr. 1-3.

Prerequisite: Consent of departmental chairperson. Concentration on a special topic in psychology. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

PSY 5850 - Orientation Experience for School Counselor Candidates

Lec. 1. Lab. 1. Cr. 1.

The course is designed to meet the recently approved Licensing Standards for School Counselor Pre K-12. School counselor candidates without teaching experience are mandated to have a semester-long orientation experience as an early part of the preparation program. This course utilizes in-school activities designed to provide observation of, participation in, and analysis of classroom instruction. The candidate will engage in teaching experiences (counseling) and feedback regarding the candidate's teaching.

PSY 6310 - Educational Statistics

Lec. 3. Cr. 3.

An introductory course in statistical methods applied to the solution of educational problems.

PSY 6350 - Measurement and Assessment

Lec. 3. Cr. 3.

Principles of measurement and assessment; teacher made tests; standardized tests.

PSY 6450 - Values, Ethics, and Legal Issues

Spring. Lec. 3. Cr. 3.

Awareness of self and societal values. Knowledge of ethic standards of practice and legal issues in the field.

PSY 6930 - Interpreting and Applying Psychological Research

Lec. 3. Cr. 3.

Prerequisite: PSY 6310 or comparable course. Designed for students selecting the non-thesis option in Educational Psychology and Counselor Education. Designed specifically for the research consumer (practitioner) utilizing field-based applications of research and statistical principles for school and nonschool mental health settings.

PSY 6940 - Directed Experience in Psychology I

Cr. 1-9.

Directed independent study.

PSY 6941 - Directed Experience in Psychology II

Cr. 3.
Directed independent study.

PSY 6990 - Research and Thesis

Cr. 1-9.

PSY 7000 - Life Span Development

Lec. 3. Cr. 3.
Focus on developmental theories in understanding the physical, cognitive, and psychological development across the life span.

PSY 7170 - Consultation in the Education Setting

Lec. 3. Cr. 3.
Prerequisite: COUN 6362. Study of a broad range of educational and behavioral consultation techniques; specifically designed as an intervention course for the school counselor and other school services personnel. The course emphasizes the use of indirect service delivery and collaborative consultation models with educators and parents.

PSY 7200 - Advanced Educational Psychology

Cr. 3.
Recent research in educational psychology and its application for teaching and for educational services in schools and colleges.

PSY 7300 - Special Topics

Lec. 3. Cr. 3.
Concentration on a special topic in educational psychology. Course maybe repeated if topic is different.

PSY 7310 - Advanced Educational Statistics

Lec. 3. Cr. 3.
Prerequisite: FOED 6920 and PSY 6310 or consent of instructor. Review of introductory significance tests and correlational methods; common factorial designs; and common multivariate procedures.

PSY 7610 - Introduction to Personality Assessment

Lec. 3. Cr. 3.

Prerequisite: PSY 4250 (5250) and advanced graduate standing. Psychological evaluation; self-report inventories; and introduction to projective techniques.

PSY 7730 - Individual Testing

Lec. 3. Cr. 3.

Prerequisite: PSY 4250 (5250), six credits in psychological and/or educational measurement, and permission of instructor. Techniques and practice in individual testing; emphasis on intelligence tests.

PSY 7900 - Independent Study in Educational Psychology

Cr. 3.

Prerequisite: Advanced graduate standing and consent of instructor. Study on an individual basis in the area of emphasis.

PSY 7910 - Assessment and Intervention

Lec. 3. Cr. 3.

Prerequisite: PSY 7730 and consent of instructor. Review of psychometric theory; role of the school psychologist; individual and group assessment of cognitive, affective, motor, and academic performance; basic interventions; consultations.

PSY 7920 - Assessment and Intervention

Lec. 3. Cr. 3.

Prerequisite: PSY 7610. Individual assessment of neuropsychological functioning; advanced personality assessment of children and adolescents; advanced interventions; consultations.

PSY 7950 - Internship in School Psychology

Cr. 3.

Prerequisite: PSY 7920 and consent of instructor. A planned developmental experience in a school setting supervised by a licensed or certified psychologist.

Reading

READ 4020 (5020) - Storytelling and Traditional Literature

Cross-listing: LSCI 4020 (5020)

Lec. 3. Cr. 3.

Storytelling techniques and literature presentation through storytelling. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

READ 4411 (5411) - Reading Writing Connections: Secondary

Lec. 3. Cr. 3.

Prerequisite: Full admission to Teacher Education. Explores the connection between the reading and writing process as a means of mutual improvement. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

READ 4540 (5540) - Multiethnic Literature for Infants, Toddlers, and Preschoolers

Cross-listing: LSCI 4540 (5540)

Lec. 1. Cr. 1.

Introduction to preschool trade books and related materials reflecting an understanding of multiethnicity. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

READ 4550 (5550) - Multiethnic Literature for Children

Cross-listing: LSCI 4550 (5550)

Lec. 1. Cr. 1.

Introduction to children's trade books and related materials reflecting an understanding of multiethnicity. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

READ 4560 (5560) - Multiethnic Literature for Adolescents and Adults

Cross-listing: LSCI 4560 (5560)

Lec. 1. Cr. 1.

Introduction to adolescent and adult trade books and related materials reflecting an understanding of multiethnicity. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

READ 4570 (5570) - Young Adult Literature

Cross-listing: LSCI 4570 (5570)

Lec. 3. Cr. 3.

A survey of young adult literature appropriate for middle and high school students with a focus on contemporary and diverse works. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

READ 6100 - Uses of Technology in Literacy Education

Lec. 3. Cr. 3.

Analysis of technological applications in literacy instruction; emphasis on computer uses in reading and language arts instruction.

READ 6310 - Assessment and Intervention in Literacy

Lec. 3. Cr. 3.

Prerequisite: READ 6340 and READ 6350. Nature and causes of literacy difficulties. Diagnostic and remedial procedures. Supervised practice in testing and remedial teaching.

READ 6340 - Literacy in the Elementary School

Lec. 3. Cr. 3.

Developmental reading skills, instructional procedures, materials, and evaluation.

READ 6350 - Literacy in the Secondary School

Lec. 3. Cr. 3.

Advanced reading skills, content area reading skills, organization and supervision of secondary reading programs.

READ 6360 - Literacy for Diverse Populations

Lec. 3. Cr. 3.

Prerequisite: Full admission to the Teacher Education Program. This course will cover the five main components of reading and is an integration of concepts fundamental to the development of literacy with an emphasis on diverse learners including those with dyslexia. It includes a study of language development and communication skills, language arts, content area reading, and the assessment and selection of appropriate instructional strategies including the Orton Gillingham methodology. Practicum embedded into course. A minimum grade of B is required to meet requirements for licensure candidates.

READ 6550 - Contemporary Children's Literature

Cross-listing: LSCI 6550

Lec. 3. Cr. 3.

Through the lens of the psychology of reading, a survey of contemporary and diverse children's literature and the authors and illustrators who create the books.

READ 6600 - Literature Across the Curriculum

Cross-listing: LSCI 6600

Lec. 3. Cr. 3.

Uses of literature in English/language arts, science, social studies, math, and other curricular areas. Equal emphasis on enhancement of content areas and integration across content areas.

READ 6800 - Practicum Experiences in Literacy

Cr. 3.

Prerequisite: Prerequisite: Full admission to the Teacher Education Program; READ 6340 and READ 6350. Practical field experience in student's major area of emphasis. A minimum grade of B is required to meet requirements for licensure candidates.

READ 6900 - Problems in Reading

Cr. 3.

Prerequisite: Admission to candidacy. Independent study of pertinent issues in reading.

READ 6920 - Topics

Cr. 1-6.

Independent study of reading-related issues.

READ 6990 - Research and Thesis

Cr. 6.

READ 7000 - Seminar in Reading and Language Arts

Lec. 3 Cr. 3.

An examination and analysis of research, trends, and topics related to literacy education.

READ 7010 - Literacy Across the Curriculum

Lec. 3. Cr. 3.

Explores applications of literacy skills and strategies in all curricular areas.

READ 7020 - Family Literacy

Lec. 3. Cr. 3.

Issues related to enhancing literacy of all family members.

READ 7370 - Linguistics: Theory and Application for Educators

Lec. 3. Cr. 3.

Explores language structures (semantics, syntax, morphology, and phonology) and first and second language acquisition and development.

Secondary Education

SEED 4120 (5120) - Materials and Methods of Teaching English

Lec. 3. Cr. 3.

Prerequisite: Full admission to the Teacher Education Program Corequisite: FOED 3820 or CUED 6800. Principles, objectives, techniques, evaluation in secondary school teaching of English. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus. A minimum grade of B is required to meet degree requirements for licensure candidates.

SEED 4121 (5121) - Materials and Methods of Teaching Career Technical Education

Lec. 3. Cr. 3.

Principles, objectives, Techniques, evaluation in secondary school teaching of career technical education. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus. A minimum grade of B is required to meet degree requirements for licensure candidates.

SEED 4122 (5122) - Materials and Methods of Teaching Mathematics

Lec. 3. Cr. 3.

Prerequisite: Full admission to the Teacher Education Program Corequisite: FOED 3820 or CUED 6800. Principles, objectives, techniques, evaluation in secondary school teaching of Mathematics. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus. A minimum grade of B is required to meet degree requirements for licensure candidates.

SEED 4123 (5123) - Materials and Methods of Teaching the Sciences

Lec. 3. Cr. 3.

Prerequisite: Full admission to the Teacher Education Program Corequisite: FOED 3820 or CUED 6800. Principles, objectives, techniques, evaluation in secondary school teaching of the sciences. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus. A minimum grade of B is required to meet degree requirements for licensure candidates.

SEED 4124 (5124) - Materials and Methods of Teaching Social Studies

Lec. 3. Cr. 3.

Prerequisite: Full admission to the Teacher Education Program Corequisite: FOED 3820 or CUED 6800. Principles, objectives, techniques, evaluation in secondary school teaching of Social Studies. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus. A minimum grade of B is required to meet degree requirements for licensure candidates.

SEED 4125 (5125) - Materials and Methods of Teaching Foreign Languages

Lec. 3. Cr. 3.

Prerequisite: Full admission to the Teacher Education Program Corequisite: FOED 3820 or CUED 6800. Principles, objectives, techniques, evaluation in secondary school teaching of Foreign Languages. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus. A minimum grade of B is required to meet degree requirements for licensure candidates.

SEED 4322 (5322) - Teaching Algebra in Middle/High School

Cr. 3.

Topics in Algebra, philosophy, new trends, and methods of teaching algebra in Grades 5-12.

SEED 5322 - Teaching Algebra to Middle/High School

Cross-listing: SEED 4322

Lec. 3 Credit 3

Topics in Algebra, philosophy, new trends, and methods of teaching Algebra in Grades 5-12.

SEED 5422 (4422) - Teaching Secondary Mathematics Using Technology

Lec. 3. Credit 3.

Prerequisite: Full admission to the Teacher Education Program. Exploring technologies specific to mathematics teaching and appropriate applications of these technologies in the classroom. Students enrolled in the 5000-level will be required to complete additional work as stated in the syllabus.

SEED 6120 - Seminar in Secondary English Education

Lec. 3. Cr. 3.

A study of English Education with emphases on current research, traditions, and the teaching of Secondary English.

SEED 6121 - Seminar in Secondary Industrial Education

Lec. 3. Cr. 3.

A study of Industrial Education past and present with emphasis on implications on the future for curriculum development, evaluation, and methods of teaching.

SEED 6122 - Seminar in Secondary Social Studies Education

Lec. 3. Cr. 3.

Analysis of the history and assumptions of major curricular traditions, related research, and instructional strategies will be stressed.

SEED 6123 - Seminar in Secondary Mathematics & Science

Cr. 3.

A study of science and math education with emphasis on trends and present practices.

SEED 6210 - Secondary School Programs

Lec. 3. Cr. 3.

A study of curricular and instructional issues in various secondary school content areas as they relate to high school programs.

Service Learning

SVCL 4150 (5150) - Topics

Lec. 0-9. Cr. 0-9.

This course will coordinate and supervise service learning opportunities for students. The specific service learning activity will be designated in the title at each offering. The number of hours of credit will be based on the magnitude of

the topic and the clock hours of face-to-face service learning effort. Course objectives and grading guidelines will be established by the faculty at the time each course is offered. Students in the 5000-level course will be required to complete additional coursework as stated in the syllabus.

SVCL 4920 (5920) - Service Learning in Your Community

Lec. 0-3. Cr. 0-3.

This course provides students with the opportunity to use their professional skills to better their community through service learning. This course may be repeated for credit. Students in the 5000-level course will be required to complete additional work as stated in the syllabus.

SVCL 6150 (7150) - Topics

Lec. 0-9. Cr. 0-9.

This course will coordinate and supervise service learning opportunities for students. The specific service learning activity will be designated in the title at each offering. The number of hours of credit will be based on the magnitude of the topic and the clock hours of face-to-face service learning effort. Course objectives and grading guidelines will be established by the faculty at the time each course is offered. Students in the 7000-level course will be required to complete additional coursework as stated in the syllabus.

SVCL 6920 (7920) - Service Learning in Your Community

Lec. 0-3. Cr. 0-3.

This course provides students with the opportunity to use their professional skills to better their community through service learning. This course may be repeated for credit. Students in the 7000-level course will be required to complete additional work as stated in the syllabus.

Sociology and Political Science

SOC 4010 (5010) - Organized Crime

Cross-listing: CJ 4010 (5010)

Lec. 3. Cr. 3.

Prerequisite: SOC 1010 or 1100 or consent of instructor. Organized crime in America as a product of legal, historical, cultural, and economic forces. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

SOC 4040 (5040) - Law and Culture (Anthropology)

Cross-listing: CJ 4040 (5040)

Lec. 3. Cr. 3.

Prerequisite: SOC 1010 or 1100 or consent of instructor. A comparative cross-cultural analysis of primitive, traditional, and modern attitudes toward law, social control, punishment, and individual responsibility. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

SOC 4080 (5080) - Sociology of Appalachia

Lec. 3. Cr. 3.

Prerequisite: SOC 1010 or 1100 or consent of instructor. An exploration of the people, culture, and political economy of Appalachia. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

SOC 4090 (5090) - Cross Cultural Communications and Cultural Diversity

Lec. 3. Cr. 3.

Prerequisite: SOC 1010 or 1100 or consent of instructor. An examination of the socio-cultural context of communication with emphasis upon enhancing communication skills across cultures. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

SOC 4120 (5120) - Sociology of Death and Dying

Lec. 3. Cr. 3.

Prerequisite: SOC 1010 or SOC 1100 or consent of the instructor. The social and cultural dimensions of death and dying in American society with emphasis on the meaning of death, the death industry, the social context of death and dying, and bereavement. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

SOC 4210 (5210) - Race, Ethnicity and Multiculturalism

Lec. 3. Cr. 3.

Prerequisite: SOC 1010 or 1100 or consent of instructor. Ethnic and cultural variations in the U.S. and similar mass societies. Emphasis on economic, political, and social relationships between ethnic groups. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

SOC 4220 (5220) - Sociology of Mass Communications

Lec. 3. Cr. 3.

Prerequisite: SOC 1010 or 1100 or consent of instructor. Historical and organizational analysis of various mass media and their content. Social issues and the mass media. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

SOC 4320 (5320) - Sociology of Religion

Lec. 3. Cr. 3.

Prerequisite: SOC 1010 or 1100 or consent of instructor. Cross-cultural analysis of religion as a social factor at the societal, organizational, and personality systems levels. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

SOC 4330 (5330) - Population and Social Process

Lec. 3. Cr. 3.

Prerequisite: SOC 1010 or 1100 or consent of instructor. Sociological analysis of the interrelationship between particular population characteristics and patterns of social organization. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

SOC 4430 (5430) - People in Organizations

Lec. 3. Cr. 3.

Prerequisite: SOC 1010 or 1100 or consent of instructor. Analysis of the structures and processes of large bureaucratic organizations, with emphasis on individuals' relationships to them. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

SOC 4500 (5500) - Sociology of Alcohol Abuse and Alcoholism

Lec. 3. Cr. 3.

Prerequisite: SOC 1010 or 1100 or consent of instructor. Sociological analysis of alcohol abuse and alcoholism; issues in prevention and rehabilitation; implications for education. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

SOC 4510 (5510) - Social Deviance

Lec. 3. Cr. 3.

Prerequisite: SOC 1010 or 1100 or consent of instructor. Examination of various groups who are identified as deviant due to their unacceptable behavior and relative powerlessness. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

SOC 4610 (5610) - Contemporary American Family

Lec. 3. Cr. 3.

Prerequisite: SOC 1010 or 1100 or consent of instructor. Models of family organization; variations in the institutional pattern; kinship; basic social trends affecting the family. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

SOC 4660 (5660) - Corrections

Cross-listing: CJ 4660 (5660)

Lec. 3. Cr. 3.

Prerequisite: SOC 1010 or 1100 or consent of instructor. Correctional services, practices and issues with particular attention to the maximum security adult institution. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

SOC 4810 (5810) - Concepts of Gerontology

Lec. 3. Cr. 3

Prerequisite: PSY 3200 or 3300 or SOC 1010. Physical and psychosocial aging processes. Issues in the care of the senior adults. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

SOC 4830 (5830) - Medical Sociology

Lec. 3. Cr. 3.

Prerequisite: SOC 1010 or 1100 or consent of instructor. Examination of the significance of the complex relationship between attitudes, beliefs relating to the underlying causes of disease, the level of health characteristics, appropriate treatment practices and the role of the healer in various groups and societies. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

SOC 4860 (5860) - Social Movements and Social Change

Lec. 3. Cr. 3.

Prerequisite: SOC 1010 or 1100 or consent of instructor. Analysis of social movements and other kinds of planned and unplanned change in society. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

SOC 4900 (5900) - Internship in Sociology

Lec. 3. Cr. 3.

Prerequisite: 9 hours of sociology. See instructor prior to enrolling. Students are placed with and work in a public or private agency which is compatible with their interests. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

SOC 4910 (5910) - Independent Study (Anthropology)

Cr. 1-3.

Prerequisite: Consent of instructor. Allows the student to undertake study in an area of anthropology where there is no appropriate course. May be taken twice, provided that the topic is different. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

SOC 4920 (5920) - Data Analysis and Management

Lec. 3. Cr. 3.

Prerequisite: SOC 3910 or consent of instructor. The techniques of management and analysis of quantitative social science data from primary and secondary sources. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

SOC 4930 (5930) - Field Research Methods

Lec. 3. Cr. 3.

Prerequisite: SOC 2900 or consent of instructor. An in-depth examination and direct involvement with various qualitative research tools and techniques used by sociologists. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

SOC 4950 (5950) - Independent Study

Cr. 1-3.

Prerequisite: Consent of instructor. Allows the student to undertake study in an area of sociology where there is no appropriate course. May be taken twice, provided that the topic is different. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

SOC 4960 (5960) - Special Topics (Anthropology)

Cr. 3.

Prerequisite: Consent of instructor. Seminar or lecture course on a selected topic, issue, or interest area in anthropology. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

SOC 4970 (5970) - Special Topics

Cr. 1-3.

Prerequisite: Consent of instructor. Seminar or lecture course on a selected topic, issue, or interest area in sociology. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

SOC 4980 (5980) - Special Topics

Cr. 1-3.

Prerequisite: Consent of instructor. Seminar or lecture course on a selected topic, issue, or interest area in sociology. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

SOC 4990 (5990) - Special Topics

Cr. 1-3.

Prerequisite: Consent of instructor. Seminar or lecture course on a selected topic, issue, or interest area in sociology. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

SOC 5680 - Seminar in Comparative Family Institutions

Lec. 3. Cr. 3.

Cross-cultural analysis of family institutions, focusing mainly on a comparative study of social organizations.

SOC 6100 - Interdisciplinary Cultural Training

Cross-listing: HIST 6100

Lec. 3. Credit 3.

This will be an active learning course focused on sociology, history, cultures, economics, and language of the Cherokee Nation and Appalachia. It will explore effective strategies to collaboratively solve complex food-energy-water challenges from a culturally responsive perspective.

Spanish

SPAN 4010 (5010) - Introduction to the Literature of Spain

Lec. 3. Cr. 3.

Prerequisite: SPAN 3010 or equivalent. Selections from the literature of Spain. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

SPAN 4020 (5020) - Introduction to the Literature of Spanish America

Lec. 3. Cr. 3.

Prerequisite: SPAN 3010 or equivalent. Selections from the literature of Spanish America. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

SPAN 4110 (5110) - Culture and Civilization of Spain

Lec. 3. Cr. 3.

Prerequisite: SPAN 3010 or equivalent. Lectures, readings, and discussion in Spanish on the culture and civilization of Spain. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

SPAN 4120 (5120) - Culture and Civilization of Spanish America

Lec. 3. Cr. 3.

Prerequisite: SPAN 3010 or equivalent. Lectures, readings, and discussion in Spanish on the culture and civilization of Spanish America. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

SPAN 4810 (5810) - Special Topics in Spanish

Lec. 3. Cr. 3.

Prerequisite: SPAN 3010. This course may be repeated if the topic is different. Qualified students may be able to take this course without the prerequisite by contacting the instructor. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

SPAN 6010 - Special Topics in Spanish

Read. 1-4. Cr. 1-4.

Concentrated readings in areas of special interest. Available to graduate students minoring in Spanish, with consent of departmental chairperson. (Maximum of 12 credits.)

Special Education

SPED 4000 (5000) - Introduction to Communication Disorders

Lec. 3. Cr. 3.

Principles of and therapeutic approaches to speech, language, and hearing disorders. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

SPED 4040 (5040) - Introduction to Education of Gifted and Talented

Lec. 3. Cr. 3.

Topics to include: characteristics, incidence, identification, diagnosis and educational needs of gifted and talented children/youth. Graduate work would include but not be limited to a case study of gifted persons. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

SPED 4050 (5050) - Sign Language I

Lec. 3. Cr. 3.

Introduction to and development of a basic vocabulary in Signed English and concepts in the use of alternated methods of communication. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

SPED 4090 (5090) - Sign Language II

Lec. 3. Cr. 3.

Prerequisite: SPED 4050 (5050) Continuation of vocabulary development in signed English and appreciation of practical situations in various professional fields. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

SPED 4121 (5121) - Materials and Methods of Teaching Career Technical Education

Lec. 3. Cr. 3.

Principles, objectives, techniques, and evaluation in secondary school teaching of career technical education. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

SPED 4140 (5140) - Curriculum Development and Education of Gifted and Talented Children/Youth

Lec. 3. Cr. 3.

Topics to include: school programs, curricula, materials, and methods for the education of gifted and talented. Graduate work would include but not be limited to comparing and contrasting three models in gifted education. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

SPED 4200 (5200) - Teaching Students with Autism Spectrum Disorders

Lec. 3. Cr. 3.

Prerequisite: Full admission to the Teacher Education Program Within the context of persons with ASD, this course is designed to provide the student with a model of the teaching process progressing from identification, to instructional design, to the use of research-validated methods for instructional delivery and the provision of needed educational, social, academic, and behavioral supports. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

SPED 4850 (5850) - Workshop in Education

Cr. 1-6.

Laboratory approach providing opportunities for experienced education personnel to study in-depth special education problems. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

SPED 5130 - Methods for Teaching Persons with Mild and Moderate Disabilities

Lec. 3. Cr. 3.

Prerequisite: SPED 6010 and SPED 6320; Full admission to the Teacher Education Program. Designed to empower the preservice special educator with skills necessary to implement an integrated curriculum in a variety of placements.

SPED 5200 - Teaching Students with Autism Spectrum Disorders

Cross-listing: SPED 4200

Lec. 3 Credit 3

Prerequisite: Full admission to the Teacher Education Program. Within the context of persons with ASD, this course is designed to provide the student with a model of the teaching process progressing from identification, to instructional design, to the use of research-validated methods for instructional delivery and the provision of needed educational, social, academic, and behavioral supports.

SPED 5340 - Systematic Instruction of Persons with Comprehensive Disabilities

Lec. 3. Cr. 3.

Prerequisite: SPED 6010 and SPED 6320; Full admission to the Teacher Education Program. Examination of assessment procedures, effective and efficient instructional approaches for achievement of learning mastery and proficiency.

SPED 6000 - Behavioral Interventions and Supports

Lec. 3. Cr. 3.

The design, implementation, and evaluation of behavioral interventions and individualized behavioral supports for children and youth with disabilities who display challenging behavior.

SPED 6010 - Survey of Disability Characteristics, Procedures, and Methods in Special Education

Lec. 3. Cr. 3.

A survey of the characteristics and educational needs of persons with disabilities; educational methods and procedures.

SPED 6020 - Intellectual Disability

Lec. 3. Cr. 3.

Prerequisite: SPED 6010. An introduction to the diagnosis, characteristics, interventions, and best practices for working with individuals with intellectual disabilities.

SPED 6030 - Learning Disabilities

Lec. 3. Cr. 3.

Prerequisite: SPED 6010. A detailed overview of historical and contemporary concepts and practices concerning children with specific learning disabilities.

SPED 6040 - Classroom Applications using Applied Behavior Analysis

Lec. 3. Cr. 3.

Prerequisite: SPED 6010 or consent of instructor. Classroom applications focusing on an analysis of theories, identification, assessment, treatment, and education of children and youth with problematic behavior.

SPED 6050 - Introduction to Applied Behavior Analysis

Lec. 3. Cr. 3.

An introduction to the application of applied behavior analysis including the theoretical origins and development of behavioral supports for individuals with learning and behavioral challenges.

SPED 6060 - Education of Orthopedic and Motor Impaired

Lec. 3. Cr. 3.

Prerequisite: SPED 6010. Research and program intervention in learning abilities of individuals with orthopedic and neurologic limitations and other health-related programs.

SPED 6070 - Individualized Educational Planning

Lec. 3. Credit 3.

Prerequisite: Full admission to Teacher Education Program. Develop knowledge of core components of individualized education plans and formal lesson plans and the skills needed to thoughtfully create these plans. A minimum grade of B is required to meet degree requirements for licensure candidates.

SPED 6120 - Early Childhood Special Education Assessment

Lec. 3. Cr. 3.

Assessment, planning, and intervention procedures specific to child, environment, and family. Design and evaluation of intervention plans.

SPED 6320 - Assessment of Persons with Disabilities

Lec. 3. Cr. 3.

Prerequisite: SPED 6010; Full admission to the Teacher Education Program. Provides the student with knowledge and skills in the administration and interpretation of educational assessment instruments used in the evaluation of persons with disabilities. A minimum grade of B is required to meet licensure requirements for licensure candidates.

SPED 6810 - Practicum and Seminar in Special Education

Cr.1-9.

Prerequisite: SPED 6010 and prerequisite or corequisite of SPED 5130 or SPED 5340. Supervised participation and seminar in special education programs for exceptional children.

SPED 6900 - Problems in Special Education

Cr. 3.

A critical study of problems of special education with special attention to research findings.

SPED 6920 - Topics

Cr. 1-9.

Laboratory approach providing opportunities for experienced educational personnel to study in-depth special education problems of persons with disabilities.

SPED 6990 - Research and Thesis

Cr. 3,6.

SPED 7110 - Family Collaboration in Special Education

Lec. 3. Cr. 3.

Concepts, intervention strategies, and issues related to working with parents of exceptional children.

SPED 7130 - Methods of Teaching Persons with Mild to Moderate Disabilities

Lec. 3. Credit 3.

Prerequisite: Full admission to the Teacher Education Program; SPED 6030 and SPED 6070. Designed to empower

the candidate with skills necessary to implement an integrated curriculum in a variety of placements. A minimum grade of B is required to meet degree requirements for licensure candidates.

SPED 7200 - Teaching Individuals With Autism Spectrum Disorder

Lec. 3. Credit 3.

Prerequisite: Full admission to the Teacher Education Program. Provides information about the characteristics of and strategies needed to work with individuals with a diagnosis of autism. A minimum grade of B is required to meet degree requirements for licensure candidates.

SPED 7300 - Seminar in Special Education

Cr. 1-9.

A critical study of current issues in Special Education (variable topics).

SPED 7340 - Systematic Instruction of Persons with Comprehensive Disabilities

Lec. 3. Credit 3.

Prerequisite: Full admission to the Teacher Education Program; SPED 6020 and SPED 6070. Assessment procedures, effective and efficient instructional approaches for achievement for individuals with moderate to severe disabilities. A minimum grade of B is required to meet degree requirements for licensure candidates.

SPED 7800 - Laboratory and Field Experiences in Education

Cr. 3-4.

Supervised practicum, observation, simulation, internships, and externships in education, including direct instruction in and/or supervision of education programs serving exceptional children, youth, and adults.

SPED 7810 - Internship and Seminar in Special Education

Cr. 1-9.

Prerequisite: Advanced graduate standing or permission of instructor. Supervised participation in community-based special education programs for exceptional individuals.

SPED 7910 - Advanced Research Project in Special Education

Cr. 3.

Individually designed to meet the needs of the graduate student, including research skills and study (faculty sponsor required).

Speech

SPCH 4000 (5000) - Introduction to Communication Disorders

Lec. 3. Cr. 3.

Principles of and therapeutic approaches to speech, language, and hearing disorders. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

SPCH 4150 (5150) - Speech and Language Acquisition and Development

Lec. 3. Cr. 3.

Normal speech/language development, anatomy of speech structures, distinctive features and implications of process and analysis systems. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

Theatre

THEA 4100 (5100) - Advanced Acting

Lec. 3. Cr. 3.

Prerequisite: THEA 2100. Advanced voice and movement study for the stage with an emphasis on period acting styles; in-depth script and character analysis; advanced scene study. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

THEA 4121 (5121) - Shakespeare

Cross-listing: ENGL 4121 (5121)

Fall. Lec. 3. Cr. 3.

Historical, thematic, and other approaches in the study of Shakespeare. (May be repeated once as an elective, provided the course content is different.) Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

THEA 4400 (5400) - Dramatic Literature

Lec. 3. Cr. 3.

Study of representative plays drawn from the classical through contemporary periods. Students enrolled in learning and teaching device. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus. The 5000-level course will be required to complete additional work as stated in the syllabus.

THEA 4500 (5500) - Creative Dramatics

Lec. 3. Cr. 3.

Use of an individual's dramatic imagination as a learning and teaching device. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

Wildlife and Fisheries Science

WFS 4220 (5220) - Biostatistics

Lec. 3. Cr. 3.

Prerequisite: MATH 1530 or MATH 1830. Probability and frequency distribution; statistical populations and samples; and tests of hypotheses used in biological research. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

WFS 4230 (5230) - Animal Behavior

Lec. 3. Cr. 3.

Prerequisite: Junior standing. Introduction to basic principles underlying the behavior of animals. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

WFS 4500 (5500) - National Wildlife Policy

Lec. 3. Cr. 3.

Prerequisite: 8 semester hours of biology. Policies, agencies, and laws that influence wildlife management on a national level. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

WFS 4630 (5630) - Ornithology

Lec. 2. Lab. 3. Cr. 3.

Prerequisite: Junior standing. General survey of the class Aves with emphasis on morphology, identification, and ecology of local birds. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

WFS 4640 (5640) - Waterfowl Ecology and Management

Lec. 2. Lab. 3. Cr. 3.

Prerequisite: WFS 3130 and WFS 4740 (5740) or consent of instructor. Advanced ecological principles as illustrated by ducks, geese, and swans, including habitat selection, morphological and behavioral adaptations, intraspecific and interspecific interactions, and reproductive ecology. Field techniques for identifying species and management approaches are emphasized in the laboratory. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

WFS 4650 (5650) - Marine Biology

Lec. 3. Lab. 2. Cr. 4.

Prerequisite: BIOL 3130 or WFS 3130. An introduction to the study of the marine environment and marine organisms. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

WFS 4660 (5660) - Wild Bird Ecology

Lec. 2. Lab.3. Cr. 3.

Prerequisite: BIOL 3130 or WFS 3130. The ecology and natural history of selected avian species, emphasizing game species, endangered species, predators, and pests. Anatomy and procedures for identification are the focus of laboratories. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

WFS 4670 (5670) - Wild Mammal Ecology

Lec. 2. Lab. 2. Cr. 3.

Prerequisite or Corequisite: BIOL 3130 or WFS 3130. The natural history and ecology of selected mammal species, emphasizing game species, furbearers, endangered species, predators, and pests. Anatomy and identification are the focus of the laboratories. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

WFS 4700 (5700) - Habitat Management

Lec. 2. Lab. 3. Cr. 3.

Prerequisite: AGHT 3450, BIOL 3240, WFS 4740 (5740), or equivalent. Description, principles, and techniques of quantitative characterization of wildlife habitat types. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

WFS 4710 (5710) - Fisheries Management

Lec. 3. Lab. 3. Cr. 4.

Prerequisite: WFS 4810 (5810) and WFS 4840 (5840) or equivalent, and consent of instructor. Theory, methods, and techniques of freshwater fisheries management. Field and laboratory. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

WFS 4711 (4711) - Fisheries Management

Lec. 3. Cr. 3.

Prerequisite: BIOL 3130 or WFS 3130. Classroom based overview of theory, methods, and techniques of freshwater fisheries management. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

WFS 4730 (5730) - Conservation Biology

Lec. 3. Cr. 3.

Prerequisite: BIOL 3130 or WFS 3130. Advanced concepts of plant and animal conservation, including biodiversity, population genetics, habitat fragmentation, endangered and threatened species, and ecosystem management. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

WFS 4740 (5740) - Wildlife Principles

Lec. 2. Cr. 2.

Prerequisite: WFS 3130 and Junior standing or consent of instructor. Classroom-based theory and principles of wildlife management. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

WFS 4760 (5760) - Fish Culture

Lec. 2. Lab. 4. Cr. 4.

Prerequisite: BIOL 3130 or WFS 3130. Cultural practices; hatchery operation, care of brood fish, transport, and stocking; the ecological requirements of hatchery species. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

WFS 4770 (5770) - Nongame Species Management

Spring (E). Lec. 3 Cr. 3

Prerequisite: Junior standing. Advanced concepts of managing nongame species. Topics include urban wildlife, funding mechanisms, monitoring and inventory techniques, habitat management, rare species, and state wildlife action plans.

WFS 4810 (5810) - Ichthyology

Lec. 2. Lab. 3. Cr. 3.

Prerequisite: Junior standing. Identification, classification, anatomy, physiology, ecology, and adaptations of fishes; emphasis on North American freshwater species. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

WFS 4820 (5820) - Mammalogy

Lec. 2. Lab. 3. Cr. 3.

Prerequisite: Junior standing. Classification, structure and function, phylogeny, and geographical distribution of mammals; emphasis on Tennessee mammals. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

WFS 4830 (5830) - Herpetology

Cross-listing: BIOL 4830 (5830)

Lec. 2. Lab. 3 Cr. 3.

Prerequisite: Junior standing. Classification, adaptations, habits, life histories, and geographical distribution of amphibians and reptiles; emphasis on North American species. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

WFS 4840 (5840) - Limnology

Cross-listing: BIOL 4840 (5840)

Lec. 2. Lab. 3. Cr. 3.

Prerequisite: Junior standing or consent of instructor. Physiochemical and biological dynamics of inland waters. Students enrolled in the 5000-level course will be required to complete additional work as stated in the syllabus.

WFS 4870 (5870) - GIS for Wildlife and Fisheries

Lec. 2. Lab. 3. Cr. 3.

Prerequisite: Junior standing. Introduction to Geographic Information Systems (GIS) using both raster and vector spatial data models, with hands on experience utilizing computers to aid problem solving in wildlife and fisheries science.

WFS 4991 (5991) - Advanced Topics

Cross-listing: BIOL 4991 (5991)

Cr. 1.

Prerequisite: Consent of instructor and departmental chairperson. Focused study equivalent to one (1) credit hour on an advanced topic in the life sciences or wildlife/fisheries sciences under faculty supervision and approval of the departmental chairperson. Course may be repeated until a maximum of 12 hours of combined credit in BIOL (WFS) 499- (599-), Advanced Topics courses, are earned.

WFS 4992 (5992) - Advanced Topics

Cross-listing: BIOL 4992 (5992)

Cr. 2.

Prerequisite: Consent of instructor and departmental chairperson. Focused study equivalent to two (2) credit hours on an advanced topic in the life sciences or wildlife/fisheries sciences under faculty supervision and approval of the departmental chairperson. Course may be repeated until a maximum of 12 hours of combined credit in BIOL (WFS) 499- (599-), Advanced Topics courses, are earned.

WFS 4993 (5993) - Advanced Topics

Cross-listing: BIOL 4993 (5993)

Cr. 3.

Prerequisite: Consent of instructor and departmental chairperson. Focused study equivalent to three (3) credit hours on an advanced topic in the life sciences or wildlife/fisheries sciences under faculty supervision and approval of the departmental chairperson. Course may be repeated until a maximum of 12 hours of combined credit in BIOL (WFS) 499- (599-), Advanced Topics courses, are earned.

WFS 4994 (5994) - Advanced Topics

Cross-listing: BIOL 4994 (5994)

Cr. 4.

Prerequisite: Consent of instructor and departmental chairperson. Focused study equivalent to four (4) credit hours on an advanced topic in the life sciences or wildlife/fisheries sciences under faculty supervision and approval of the departmental chairperson. Course may be repeated until a maximum of 12 hours of combined credit in BIOL (WFS) 499- (599-), Advanced Topics courses, are earned.

Young Children and Families

EDUC 7400 - Programs and Service Delivery Models

Lec. 3. Cr. 3.

Prerequisite: Admission to Doctoral Program. Analysis and comparison of organizations, program design, leadership, administrative, and supervisory practices.

EDUC 7450 - Doctoral Seminar: Young Children and Families

Lec. 3. Cr. 3.

Prerequisite: Admission to Doctoral Program. Inquiry into social policy, theory, research, issues, and intervention practices and personnel preparation.

EDUC 7800 - Laboratory and Field Experiences in Education

Cr. 3.

Prerequisite: Admission to Doctoral Program. Supervised practicums, observation, simulation, internships, and externships in education.

EDUC 7910 - Independent Study: Young Children and Families

Cr. 3.

Prerequisite: Admission to Doctoral Program. Study on an individual basis focusing on an area directly related to young children at risk and/or their families.