GRADUATE SYLLABI IN THE OLD FACULTY-STYLED FORMAT BEFORE AQW TEMPLATING

CEE 5630 – TRAFFIC ENGINEERING

Instructor:	Steven M. Click, PE, PhD Office & Lab: PH 439 & PH 127C Phone: 372-6464 Email: SClick@tntech.edu	**Textbook**:	Highway Capacity Manual, 2000 Edition, US Customary Units, by the Transportation Research Board.

Objectives: At the conclusion of this course, each student should have…

- Gained factual knowledge
  - Regarding traffic flow, facility type, capacity, and level of service
  - Regarding the Highway Capacity Manual, including its purpose and selected worksheet-based methods.
  - Regarding uninterrupted flow as experienced on basic freeway segments; ramps and ramp junctions, freeway weaving; and two-lane highways
  - Regarding interrupted flow as experienced at unsignalized intersections (two-way stop control, all-way stop control, and roundabouts), at signalized intersections, and on urban streets
- Learned to apply course material
  - By solving homework problems
  - By participating in field data collection, reduction, and analysis for selected facility types
  - By exposure to industry-standard software packages, namely HCS+ and Synchro+SimTraffic
- Acquired skills in working with others as a member of a team
  - By participating in group homework projects

In addition to all the work assigned to the 4630 students, those enrolled in CEE 5630 will be assigned an additional set of graduate student homework assignments. These assignments will require graduate students to learn material on their own, to investigate the theoretical background of concepts presented in class, and to analyze or evaluate more complex problems than those required of 4630 students. In addition, CEE 5630 students will be required to answer additional questions on both the midterm and final exams.

Academic and Classroom Conduct: Students are responsible for reading and complying with the current catalog concerning class attendance, academic integrity, and other student responsibilities in class. Cheating and other inappropriate behaviors will not be tolerated. It is each student's responsibility to make the instructor aware of any inappropriate behavior as it relates to this or any other course.

ADA Statement: Students with a disability that requires accommodation should contact the Office of Disability (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 372-611. When provided with the appropriate documentation, the instructor will make reasonable adjustments to take into consideration the specific handicap of each student covered under the ADA.

iLearn:

- This course will be supplemented with information on iLearn. Students are expected to understand and use iLearn during this course. Information on iLearn can be found at http://www.tntech.edu/iLearn.
  - General course information like the syllabus and schedule will be provided on iLearn.
  - Class notes and handouts will be provided on iLearn. These notes should be available by lunchtime on each class day for students to print and bring to class.
  - Homework will be provided, submitted, and graded via iLearn. Students may choose to print homework assignments to complete at home, but answers must be entered in iLearn for credit. Note that when a student prints homework assignments, care should be taken on multiple-choice

and multiple-answer questions. While iLearn will present the same questions and answers to a student once they begin an assignment, iLearn may change the order in which those answers are presented.

- The Homework section will also allow students to review homework grading to check for errors. It is the responsibility of each student to review graded assignments for correctness. Please bring any questions or concerns to the instructor's attention within one week of when the assignment was graded.
- Grade information will be provided via iLearn, and it is the responsibility of each student to confirm that grades are entered correctly. Any corrections should be brought to the instructor's attention as soon as possible.
- Note that email in iLearn is separate from your @tntech.edu email. All questions about course material should be sent via iLearn.

Group Homework:

- During this course, students will participate in 3-5 group homework projects designed to improve understanding of course material through real-world investigation.
  - Teams: Labs will be performed in teams. Students will be allowed to select their own partner for each lab assignment. Students must have different partners for each lab. Selection of teams will be made via iLearn.
  - Data Collection: Most labs will involve both data collection and data analysis. Students will have to arrange acceptable times based on assignment guidelines for data collection. Students will also be responsible for their own transportation to and from off campus locations, and should select a partner with this in mind.
  - Report: Each group will be required to submit a written report for each group homework. The instructor requires that all written portions of the assignments be done in a professional manner (neatness, grammar, sentence structure, and spelling). Substandard work will be returned without a grade. Once the student has returned the corrected assignment, the instructor will determine the effect on the assignment grade. All such reports will be prepared using a word processing or spreadsheet program, as appropriate.
  - Lab Safety: Data collection efforts will require students to travel to on- and off-campus sites and to stand near and/or cross roadways and intersections.
    - Students are expected to wear appropriate safety equipment and take normal safety precautions during these activities. Safety equipment will need to be checked out prior to data collection and returned afterward.
    - For off campus labs, students will be required to find / provide their own transportation. Safety during the lab includes safety during travel.
    - Groups that 1) do not use safety equipment or 2) do not return equipment promptly will be given a grade of 0.
    - Students who, through action or inaction, jeopardize the safety of their classmates or themselves can expect repercussions, up to and including a failing grade in the course.
    - Students who feel unsafe and/or observe unsafe behavior should meet with the instructor to discuss the situation within 24 hours of the occurrence.
  - Acceptance of Liability: As this is an elective course, any student who is unwilling to accept personal responsibility for the results of any and all actions and inactions during the course should discontinue their enrollment and participation in the course. Continued enrollment or participation in the course indicates your agreement to absolve the instructor, the Civil and Environmental Engineering Department, the College of Engineering, Tennessee Tech University, and the Tennessee Board of Regents from any liability.

CEE 4640 / 5640 – Highway Engineering – Course Syllabus
Spring 2007 – TR 1:30-2:50

Objectives: At the conclusion of this course, each student should have…

- Gained factual knowledge
    - Factors which influence the design of roadways and other transportation facilities.
    - The elements of roadway and roadside design, including
        - Design constraints like perception/reaction time, sight distance, and vehicle capabilities
        - Design of vertical curves including selection of appropriate curve length, curve layout, and determination of critical points: Vertical Point of Curvature (VPC), Vertical Point of Intersection (VPI), and the Vertical Point of Tangency (VPT).
        - Design of horizontal curves including selection of appropriate curve radii, curve layout, and determination of critical points: Point of Curvature (PC), Point of Intersection (PI), and the Point of Tangency (PT).
        - Design of roadway cross section including selection of appropriate cross slopes, drainage features, roadside barriers, and clear zones
        - Design of at-grade intersections, including selection of design vehicles, and edge-of-pavement design
        - Design of grade-separated facilities, especially interchanges.
    - Other design issues, such as determination of cut and fill, drainage issues, and parking lot design.
- Learned to apply course material
    - By completing homework assignments as provided by the instructor
    - By working in teams on design projects, namely…
        - Design of a vertical curve
        - Design of a horizontal curve
        - Design of a roadway cross section
        - Design of an at-grade intersection
        - Design of a parking lot
- Acquired skills in working with others as a member of a team

    By participating in design teams while working on the projects noted above

CEE 5640:

- CEE 5640 students will complete the Design Projects individually, rather than with a group.
    - They will meet as a group with the instructor to discuss their designs. This meeting will take place at least one day before the undergraduate presentations. They may still be asked to make a brief class presentation.
    - They may also be asked to assist the instructor with grading of undergraduate projects.
- CEE 5640 students will work together to teach at least one course topic.
    - They will meet as a group with the instructor to discuss and select appropriate content before Spring Break, and again for a review of their presentations at least one week before their first scheduled lecture.
    - They will prepare and give lecture(s), a homework assignment (which they will grade) and appropriate questions for the instructor to use on the exam.
- CEE 5640 final grades will include four components, instead of just three, with each counting equally. Students must have a grade of C or better (i.e. ≥70%) in each of the four elements to pass the course.

Safety: No unusual conditions that would create safety hazards are expected during this course.

Academic and Classroom Conduct: Students are responsible for reading and complying with the current catalog concerning class attendance, academic integrity, and other student responsibilities in class. Cheating and other inappropriate behaviors will not be tolerated. It is each student's responsibility to make the instructor aware of any inappropriate behavior as it relates to this or any other course.

ADA Statement: Students with a disability that requires accommodation should contact the Office of Disability (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 372-611. When provided with the appropriate documentation, the instructor will make reasonable adjustments to take into consideration the specific handicap of each student covered under the ADA.

WebCT: This course will be supplemented with information on WebCT. This information includes, but is not limited to, homework assignments, course syllabus and schedule, and class notes. Students are expected to understand and use WebCT during this course. Information on WebCT can be found at http://webct.tntech.edu.

Notes:

- If the schedule undergoes a significant change, a revised schedule will be posted via WebCT.
- Expect a homework assignment after each topic covered. Unless there is an unusual occurrence, homework will be due one week after the completion of the topic.
- Design projects will be assigned after major topics. Students will work in teams to complete their design projects. Projects will be due approximately two weeks after completion of the topic. All project work is due on presentation day. Only work turned in by the beginning of class will be counted for credit.
- If a group of students will be absent from class together – for a group trip or similar occurrence – please inform the instructor of affected dates as soon as possible. Students are responsible for any material missed.

CEE 4990/6900:
DURABILITY OF CEMENT-BASED MATERIALS

Spring 2007 Syllabus

Course Objectives:

- To present students with a comprehensive overview of the durability of portland cement-based materials through multi-scale (nano-, micro-, and macro-scale) investigations, including economical considerations, mitigation strategies, and microstructural characterization and chemical analysis techniques.
- To improve written technical communication skills.
- To integrate research and learning.
- To improve critical assessment (graduate level).

Course Materials:

Required Text:

None; handouts and articles will be provided

Additional Reference Texts:

S. Mindess, J.F. Young, D. Darwin, Concrete, Prentice-Hall, 2nd Edition, 2003.

P.K. Mehta, P. Monteiro, Concrete: Microstructure, Properties and Materials, McGraw-Hill, 2nd Edition, 1996. (3rd Edition to be released 9/30/05)

A. Neville, Properties of Concrete, Longman, 4th Edition, 1996.

Lea's Chemistry of Cement and Concrete, P.C. Hewlett (Editor), John Wiley, 4th Edition, 1998.

H.F.W. Taylor, Cement Chemistry, Telford, 2nd Edition, 1997.

Design and Control of Concrete Mixtures, Portland Cement Association, 14th Edition, 2002.

Course Grading (4990):

Exams:	50% (16.67% each)
Homework:	25%
Lab Reports:	25%

Course Grading (6900):

Exams:	50% (16.67% each)
Homework:	20%
Lab Reports:	20%
Project:	10%

A = 90-100, B = 80-90, C = 70-80, D = 60-70, F = < 60

Notes:

1. Students with a disability requiring accommodations should contact the Office of Disability Services (ODS). An Accommodation Request Form (ARF) 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.

2. All assignments will be collected at the ***beginning*** of class. Assignments not received at that time will be considered late and subject to a 10 percent deduction per day late. After 3 days, the assignment will not be accepted.

3. Attendance is expected, unless you contact me ***prior*** to class. If you choose to miss class, ask a peer for the notes.

4. Extensions will not be given except for extenuating circumstances (e.g., death in the family, sickness with doctor's note), provided that you notify me as soon as possible.

5. No make up labs or exams will be given except for extenuating circumstances. If you do not attend a lab session or exam, without prior consent, a zero will be given.

For exams and in class assignments, only FE approved (or similar) calculators will be permitted (you should have one already or will need one eventually). **Laboratory Report Guidelines**

The objective of the lab reports is to demonstrate an understanding of the methodologies and concepts involved in each particular lab. Brevity and conciseness are of the utmost importance, without sacrificing quality. In other words, state what you want to say in a direct manner without "fluff."

Outline of Standard Lab Report:

1. Title Page (with relevant information – class, date, name, title, etc)
2. Abstract
   - An abstract is typically one paragraph (approximately 250-300 words) concisely describing the purpose, methods, and outcomes of the lab.
3. Introduction
   - Includes objectives and scope of the work.
4. Methodology
   - Write as if someone else will be following your directions.
   - Write in paragraph form.
   - Do not copy procedure from handouts. Write/paraphrase in your own words.
5. Results
   - Present qualitative and quantitative results.
   - Do not analyze results.
   - Discuss calculation (with samples) of important data.
6. Discussion
   - Do not forget to answer any questions that may have been asked.
   - Refer to lecture notes, the textbook or other references to determine if the experimental results agree with the anticipated outcomes.
7. Conclusions
   - Do not reiterate results, but instead develop broad insights into the work conducted.

- Tables and Figures should be included in the body of the text as close to the relevant text as possible.
- Write entire lab report in the third person. Do not use "I," "we," "our," "you," etc.
- Write in passive voice.
- Use double-spaced, 12-point font.

Each lab report will be graded according to the following rubric:
Format: 5%
Technical Writing: 10%
Abstract: 10%
Understanding of the objectives, scope, and methods: 25% (Introduction, Methodology)
Understanding and interpretation of results: 30% (Results, Discussion)
Validity of conclusions: 20% (Conclusions)

CEE 6900 Project Description (Graduate Level)

The purpose of this assignment is to gain an in-depth understanding in an area of interest to you related to cement and concrete durability and to further develop you critical analysis skills. This assignment is not simply a literature review, but a *critical* review.

This means that you must present an analysis of the current state-of-the-art in a fairly narrow area:

- highlighting differences of opinion that exist in the literature,
- assessing the merit of these opinions and the research underlying them,
- drawing conclusions from the available literature, and
- identifying areas where further research is needed.

1. Choose a topic of particular interest to you.

2. Collect resources.

   Journal abstracts:

   Cement and Concrete Research
   http://www.sciencedirect.com/science/journal/00088846
   Cement and Concrete Composites
   http://www.sciencedirect.com/science/journal/09589465
   Journal of the American Ceramic Society
   http://www.blackwell-synergy.com/loi/jace
   ACI Materials Journal (or Structures Journal)
   http://www.concrete.org/PUBS/JOURNALS/JOURNALS.HTM
   ASCE Journals
   http://www.pubs.asce.org/cedbsrch.html

   Books (check other libraries to see what books are available for interlibrary loan requests):

   http://www.tntech.edu/library
   http://www.library.gatech.edu
   http://www.lib.utexas.edu/
   http://www.library.northwestern.edu/
   http://www.lib.purdue.edu/
   http://www.lib.berkeley.edu/
   http://www.library.uiuc.edu/

   Dr. Mohr's personal library:

   http://iweb.tntech.edu/bmohr/books.xls

   Internet Resources (be careful though…)

   Transportation Research Board – http://trb.org
   Federal Highway Administration – http://www.fhwa.dot.gov/
   American Society of Testing and Materials – http://www.astm.org
   National Institutes of Standards and Technology – http://www.nist.gov

3. Read the literature you have collected; begin developing an outline and several key points to develop into your paper.

4. Generate a critical review. The paper should be approximately 10-12 pages exclusive of non-body text (e.g., figures, tables, title page, etc.). You should also cite at least 10 references.

5. All papers should be double-spaced with 12 point font, including a title page, abstract, table of contents, list of figures and tables, and references with complete citations.

6. Certain critical review papers, with additional revisions, may be submitted for publication in peer-reviewed journals.

CEE 6410 – Advanced Traffic Control – Course Syllabus
Spring 2007

Objectives: The primary objective of this course is to familiarize students with the theory and practice of optimizing and evaluating both isolated traffic signals and traffic signal systems. While the exact topics, and thus student expectations, will vary based on the background of students taking the course, after completing this course most students should be able to:

- Evaluate and time basic isolated traffic signals
    - Perform field delay studies and analytical delay estimations
    - Optimize isolated traffic signal timing using theoretical methods and industry software
- Evaluate and time basic and some special case traffic signal systems
    - Perform field and analytical system delay estimations
    - Optimize traffic signal system timing using theoretical methods and industry software
    - Identify special case systems and subsystems and apply typical timing solutions
- Evaluate and time special isolated traffic signal operations
    - Understand the purpose of special operations, including preemption, overlaps, and multi-intersection control
    - Identify cases which require special operations
    - Design special operations to meet field conditions
- Implement isolated and system features in the field
    - Recognize typical equipment in a traffic signal cabinet, and identify its purpose
    - Program one or more traffic signal controllers for basic isolated operations
    - Program one or more traffic signal controllers for system operations
    - Program one or more traffic signal controllers for special isolated operations

Grading: Final grades will likely consist of two parts – projects assigned during the semester and a take-home exam. Because of the fluid nature of the course content, a specific grading breakdown cannot be provided. The final exam is likely to account for ~35% of the grade, and the projects ~65%. The value of individual projects will be based on the number of weeks of the semester dedicated to the topic and/or project work. Note that the exam problems and projects will be given letter grades, not number grades, which when combined will determine the final grade in the course.

Safety: This course involves on- and off-campus labs, during which students will be exposed to the typical safety hazards associated with traffic data collection and traffic controller programming.

- Data collection efforts will require students to travel to on- and off-campus sites and to stand near and/or cross roadways and intersections. Students are expected to wear appropriate safety equipment and take normal safety precautions during these activities.
- Traffic controller programming efforts will require students to travel to on- and off-campus sites, to stand near and/or cross roadways and intersections, and to interact with equipment inside a traffic signal controller cabinet which will be active during the programming activities. Students are expected to wear appropriate safety equipment and take normal safety precautions during these activities, and to have a sufficient knowledge of the controller cabinet environment to be safe.
- Students who, through action or inaction, jeopardize the safety of their classmates or themselves can expect repercussions, up to and including a failing grade in the course. Students who feel unsafe and/or observe unsafe behavior should meet with the instructor to discuss the situation within 24 hours of the occurrence.
- Acceptance of Liability: As this is an elective course, any student who is unwilling to accept personal responsibility for the results of any and all actions and inactions during the course should discontinue their enrollment and participation in the course. Continued enrollment or participation in the course indicates your agreement to absolve the instructor, the Civil and Environmental Engineering Department, the College of Engineering, Tennessee Tech University, and the Tennessee Board of Regents from any liability. As a condition of continuing in the class, all students will also be required to sign a liability waiver indicating their understanding and acceptance of this policy.

Academic and Classroom Conduct: Students are responsible for reading and complying with the current catalog concerning class attendance, academic integrity, and other student responsibilities in class. Cheating and other inappropriate behaviors will not be tolerated. It is each student's responsibility to make the instructor aware of any inappropriate behavior as it relates to this or any other course.

ADA Statement: Students with a disability that requires accommodation should contact the Office of Disability (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 372-611. When provided with the appropriate documentation, the instructor will make reasonable adjustments to take into consideration the specific handicap of each student covered under the ADA.

WebCT: This course will be supplemented with information on WebCT. This information includes, but is not limited to, homework assignments, course syllabus and schedule, and class notes. Students are expected to understand and use WebCT during this course. Information on WebCT can be found at http://webct.tntech.edu.

SACS QEP: This course has been provided with a SACS QEP grant which allowed for the purchase of equipment intended to allow for real-world problem solving. The instructor would like to thank the awarding committee for the resources they have provided. The course, and especially the lab experiences, should provide students with a greatly improved real-world experience during the course.

CEE 5350 ADVANCED STRUCTURAL DESIGN FALL 2007

Instructor: Dr. Sharon Huo, PH 216, Phone: 372-3454

Office Hours: 9:00 am – 10:30 am, MWF

Textbook: *Structural Steel Design LRFD Method*, Third Edition,
Jack C. McCormac and James K. Nelson, Jr., Prentice Hall, 2003

Reference: *AISC, Manual of Steel Construction*, **Thirteenth Edition**, American Institute of Steel Construction, Inc. 2005

Objectives:
(1) To advance the understanding of the behavior of structural members and connections;
(2) To have an understanding of the fundamental principles of the analysis and design of structural steel members and connections in combined loading cases or in certain structural arrangements; and
(3) To develop the ability to analyze and design the structural members and connections in moderately complex structural arrangements in a manner that ensures the safety and utility of the structure.

Grading:

Homework: (Including STAAD Assignments)	20%	Final Grade:	A:	91-100
			B:	81-90
Tests:	45%		C:	71-80
Final Exam:	20%		D:	60-70
Design Project:	15%		F:	Below 60

Attendance: Students are required to attend all classes. Absence from a test without PRIOR approval of the instructor will normally result in a grade of zero on that test. Exceptions will be made only in properly documented cases of serious illness or unavoidable contingency.

Homework: Homework is required and due at the BEGINNING of the class period on the dates shown on the assignment sheet. **Late homework will not be accepted.** Homework and tests must be completed on engineering paper. Each homework problem should consist of a problem statement, problem sketch, solution, and final answer. Homework will not be graded (grade is zero) that fails to comply with these guidelines. **It is virtually impossible to pass this course without doing the homework assignments.**

Project: Each graduate student is required to complete an assigned design project. The student should turn in a final report and give an oral presentation toward the end of the semester.

Tests and Final: Tests and final exam will be open book and open note exams.

ADA Provisions: Student with disabilities (as defined by the Americans with Disabilities Act) [ADA] should contact the instructor early in the semester or term regarding the accommodations necessary to complete the requirements of this course. The instructor will make reasonable adjustments to take into consideration the specific handicap students covered under the ADA.

CEE 5380 **BRIDGE DESIGN** **SPRING 2007**

Instructor: Dr. X. (Sharon) Huo, PH 423 Phone: 372-3188

Class Time: 1:25 – 2:20 am, MWF Office Hours: Posted on door

Text book *AASHTO LRFD Bridge Design Specifications,* AASHTO, 3rd edition, 2004
(One copy is held at the Library Reserve Desk. The loan period is one hour.)

References: *Design of Highway Bridges*, Barker and Puckett, John Wiley & Sons, 1997

Objectives: To learn the fundamental principles necessary for the analysis and design of highway bridges and to develop the ability to apply basic design procedures to bridge members.

Grading:			Final Grade:				
	Homework:	20%		A:	91-100	B:	81-90
	Tests:	34%		C:	71-80	D:	61-70
	Project	16%		F:	Below 60		
	Final Exam:	30%					

Attendance: Students are **required** to attend all classes. Absence from a test without PRIOR approval of the instructor will normally result in a grade of zero on that test. Exceptions will be made only in properly documented cases of serious illness or unavoidable contingency. The instructor reserves the right to reduce the student's final grade one letter grade for excessive absences.

Homework: Homework is required and is due at the BEGINNING of the class period of due day. **Late homework will not be accepted.** Homework must be completed on engineering papers. Each problem should consist of a problem statement, problem sketch, solution, and final answer. A straight edge should be used for all sketches and tables. **It is virtually impossible to pass this course without doing the homework assignments.**

Project: Each student is required to complete an assigned bridge design project. **Graduate student will work on a more complicated project.** The student should turn in the final report and give an oral presentation toward the end of the semester. The project will be evaluated based on technical correctness as well as neatness of the report and presentation.

Tests and Final: Tests and final exam will be open-book and open-note exams.

ADA Provisions: Student with disabilities (as defined by the Americans with Disabilities Act) [ADA] should contact the instructor early in the semester or term regarding the accommodations necessary to complete the requirements of this course. The instructor will make reasonable adjustments to take into consideration the specific handicap students covered under the ADA.

CEE 7100 Advanced Computational Methods in Engineering
(Fall 2007)

Class Schedule: TR 9:30 – 10:50 am PH 226

Instructor: Dr. Y. Jane Liu, Associate Professor of Civil Engineering
Office: PH 432; Phone: 372-3256; email: jliu@tntech.edu

Office Hours: **Tuesday and Thursday 1:00 – 1:30 pm**. Feel free to call or email me, or by appointment.

Text & Reference**:** ***Ideals, Varieties, and Algorithms – An Introduction to Computational Algebraic Geometry and Commutative Algebra***, David Cox, John Little, and Donal O'Shea, Third Edition, Springer
A Primer of Abstract Mathematics, Robert B. Ash The Mathematical Association of America
Geometric Fundamentals of Robotics, J.M. Selig, 2nd Edition, Springer

Prerequisites: CEE/ME 6930 and an additional graduate level course in engineering mechanics or consent of instructor

Objectives: The purpose of this introductory course is to give graduate level students a better understanding of the mathematical tools available for engineering research, allow them to "put their foot in the door" in the field of advanced computational analysis, and provide a starting point for future endeavors in advanced level academic research. The course will introduce the basic concept of algebraic geometry, affine space and varieties, provide a theoretical background of Groebner bases to understand the nature of the computational methods of Groebner bases and their applications in mechanics and engineering, and **show how these relatively new mathematical tools can be used to solve problems in current engineering applications and research.**

Homework: Homework will be assigned in the class and the assignments will be completed within seven to ten days, depending on the individual assignment. **Late homework and project will NOT be accepted.**

Project: The topic of the project should be in the general area of the course and include basic theoretical background, a review of published research findings, comparison of theoretical prediction and experimental results (optional but recommended), discussion and conclusions. Each student will discuss a preliminary project outline with the instructor after setting up an appointment. The results of the project will be presented in form of an oral presentation and submitted in a report in the last week.

Grading: Homework = 30%; Mid-term = 20%; Final Project and Presentation = 30%; Comprehensive Final = 20%

Scale: **A** = 100-90; **B** = 89-80; **C** = 79-70; **D** = 69-60

ADA Provisions: **ADA Provisions:**"Students with disabilities (as defined by the Americans with Disabilities Act) [ADA] should contact the instructor early in the semester or term regarding the accommodations necessary to complete the requirements of this course. The instructor will make reasonable adjustments to take into consideration the specific handicap of each student covered under the ADA."

CEE 7360 Advanced Topics in Prestressed Concrete Design SPRING 2007

Instructor: Dr. X. (Sharon) Huo, PH 423 Phone: 372-3188

Class Time: 11:15-12:10 am, MWF Office Hours: Posted on door

Prerequisites: CEE 4360, CEE 6930 and Consent of instructor

Text: *Prestressed Concrete–A Fundamental Approach*, Edward Nawy, 5th Edition, 2006

References: *ACI 318-02 Building Code, 2002*
AASHTO LRFD Bridge Design Specifications, 3rd Edition, 2004
Journal articles on the design and analysis of prestressed concrete members

Objectives: This course will cover several advanced topics on the design and analysis of prestressed concrete members and structures. Students will learn fundamental principles, analytical methods, and design approaches applied to prestressed concrete members and structures.

Grading:

Homework:	20%	Final Grade:	A:	91-100	B:	81-90
Midterm Exam:	25%		C:	71-80	D:	61-70
Project	25%		F:	Below 60		
Final Exam:	30%					

Attendance: Students are required to attend all classes. Absence from the test without PRIOR approval of the instructor will normally result in a grade of zero on the test. Exceptions will be made only in properly documented cases of serious illness or unavoidable contingency.

Homework: Homework is required and is to be turned in at the BEGINNING of the class period on due days. **Late homework will not be accepted.** Homework must be completed on engineering papers. Each problem should consist of a problem statement, problem sketch, solution, and final answer. A straight edge should be used for all sketches and tables. The homework turned in must be the individual effort of each student.

Tests and Project: The exams will be open-book and open-note. The project will be assigned in the middle of the semester. Each student should complete the assigned project by turning in a technical report and giving an oral presentation toward the end of the semester. The project will be evaluated based on technical correctness and neatness of the report and presentation.

ADA Provisions: Student with disabilities (as defined by the Americans with Disabilities Act) [ADA] should contact the instructor early in the semester or term regarding the accommodations necessary to complete the requirements of this course.

The instructor will make reasonable adjustments to take into consideration the specific handicap students covered under the ADA.

CEE 7360 Advanced Topics in Prestressed Concrete Design SPRING 2007

COURSE OUTLINE

1. Introduction of prestressed concrete structural systems;
2. Various design approaches for immediate and time-dependent prestress losses;
3. Moment-curvature analysis of bonded prestressed members;
4. Deflection calculations of prestressed members
5. Secondary moment analysis of bonded prestressed members;
6. Strut-and-tie modeling for prestressed members;
7. Modified compression field theory for shear and torsion; and
8. Design fundamentals of unbonded post-tensioned concrete floors.

EXAMS:

Midterm Exam: 11:15 – 12:10 am, Friday, March 16, 2007 (Tentative)

Final Exam: 10:30 - 12:30 am, Thursday, May 3, 2007

CEE 7360 ADVANCED TOPICS IN PRESTRESSED CONCRETE DESIGN

SPRING 2006

ADDITIONAL REQUIREMENTS ON PROJECT REPORTS (CEE DEPARTMENT)

Every CEE project report should be accompanied by an Executive Summary. The Executive Summary should include following information: a) Title of the report; b) Name(s) of the author(s); c) Objectives of the project; d) Outlines of project activities; e) Summary of project outcomes (findings); and f) Comments and discussions if any. The length of an Executive Summary should be less than a page. The Executive Summary should be placed after the cover page of a project report.

INSTRUCTIONS ON WRITTEN ASSIGNMENTS (CEE DEPARTMENT)

The student will be required to submit various types of written assignments during the semester. The instructor requires that all written portions of the assignments be done in a professional manner (neatness, grammar, sentence structure, and spelling). Substandard work will be returned without a grade. Once the student has returned the corrected assignment, the instructor will determine the effect on the assignment grade. All laboratory and course project reports will be prepared using a word processing program.

GUIDELINES FOR EFFECTIVE PRESENTATIONS (CEE DEPARTMENT)

The following guidelines should help you to develop and deliver effective presentations.

Overall Presentation

- Plan carefully. What do you want to accomplish? Are you simply informing your audience about a topic or are you trying to persuade them?
- Make the level of the material appropriate to the audience
- Use the journalistic approach
  - Tell them what you're going to tell them (outline or roadmap)
  - Tell them (introduce your topic and convey the information)
  - Tell them what you told them (summarize)
- Your introduction should make it clear why this work is important
- Leave time at the end of your presentation for questions
- Practice your presentation
- Speak comfortably and clearly
- Speak to the audience, not the screen

Effective PowerPoint Slides

- Don’t make slides to read from - present ideas, not details
- Address only 2-3 points per slide
- Choose one type of transition for entire presentation
- Present your data in graphs, not tables

Text Guidelines

- Generally no more than 6 lines on a slide
- Use font sizes large enough to view from anywhere in the room (font sizes usually range from 20 to 48 point)
- Larger font indicates more important information
- Use complementary colors (e.g., a white background and black text or a dark blue background with yellow text)
- Don’t use more than two fonts on any slide, and use the same two fonts throughout the entire presentation
- Choose a plain font, fancy fonts can be hard to read
- Words in all capital letters are hard to read
- Limit punctuation marks

Clip Art and Graphics

- Should enhance and complement the text, not overwhelm
- No more than two graphics per slide

CEE 6440 HYDROMETEOROLOGY
(FALL 2007)
Instructor: Dr. Faisal Hossain
Department of Civil and Environmental Engineering
PH 332

BACKGROUND:

Twenty years ago, you could hardly find a course titled 'Hydrometeorology'. Back then, the need to study the fate, distribution and occurrence of water in our natural environment through a combined understanding of hydrology of the land processes and meteorology of the atmosphere was not recognized. In fact, meteorologists and hydrologists often pursued the scientific inquiry within their supposedly well-defined area to look for answers to their problems. For example, a hydrologist interested in the flood problem felt it unimportant to know the atmospheric physics behind the formation of clouds, the role played by solar radiation and wind. Vice versa, a meteorologist could not appreciate the implications of his/her understanding of solar radiation, cloud type and atmospheric stability on terrestrial processes such as, say, infiltration and evapo-transpiration. With population growth and rising demands of our 'comfortable' living, earth's precious water resources are becoming scarcer. We have begun to realize that we live in a world where the earth's environment has complex interactions that should not be ignored in order to get a better understanding of the spatio-temporal variability of our water resources.

WHAT THIS COURSE PROVIDES

This course titled "Hydrometeorology" essentially represents an effort to impart a 'combined approach (hydrology+meteorology) perspective' focusing at the interface between hydrology and meteorology. While it is virtually impossible to deliver a very deep understanding of both hydrology and meteorology (you get year long courses on these topics), we shall study the concepts and principles in a fashion such that, once completed, the student will leave with an appreciation of the physical processes of the atmosphere that dictate the hydrology of water on the land surface and vice versa (i.e., water cycle). In simple terms, one major aim is reduce the amount of tunnel vision on our understanding of the water cycle by beginning to learn to study at the interface between hydrology and meteorology. We shall also stress the 'land surface' as our 'playground' in this course as that is where we live today and defines our primary environment.

Newly Added Features of the Course:

1) Basics of remote sensing using electromagnetic spectra, particularly in the Microwave frequency that is appropriate for hydrologic measurement on a large scale. Variables considered will be – soil moisture, precipitation and discharge.
2) Radiative transfer theory for inverse modeling of remotely sensed parameters.
3) Using actual sensor data (satellite and radar) on remote sensing, spatial data analysis and error characterization will also be taught.
4) Radiation budgets.
5) Miscellaneous meteorological processes (such as precipitation formation) and its conceptual modeling.

OFFICIAL GOAL

"This course is designed to introduce graduate students to natural mechanisms for land atmosphere interaction that dictate the dynamics of the water cycle."

PREREQUISITES

A basic understanding of hydraulics and hydrology principles that are provided at the undergraduate level (CEE3420 and CEE5420) is needed. Prior understanding of meteorology (atmospheric physics and/or climate) is not required as that will be provided on a 'required' basis as the course progresses. Students

are however expected to have working knowledge on computing (any language will suffice) and differential calculus.

MODUS OPERANDI: INSTRUCTIONAL FORMAT

Instruction will follow an essentially active learning format with basic concepts taught by providing real-world examples stressing assumptions. Difficult (and often sleep-inducing) theoretical derivations will be separated out in notes and avoided in class. Open-book mode of responding to grading exercises will be the most preferred method of evaluating progress of a student's understanding (no memorizing needed!). The lion share of the evaluation criteria will be based on assessing the student's capacity for independent thinking, creativity in identifying a real-world application of hydrometeorological concepts and clarity in presenting his ideas in class projects. Hence, 50% of the grading will be based on 5 mini class projects on various topics. The fifth class project will be on a topic that relevant to the student's area of research. All class projects will have equal weightage. Class projects could be literature review or building a computer program to simulate specific processes. A complete and professionally written end-to-end report is due for each project. In addition, the final class project will have a public presentation that could be made part of the CEE graduate seminar upon the student's consent.

GRADING POLICY

Homework:	40%
Quizzes and Class interaction:	10%
Mini Class Projects (5):	50%

HOMEWORK AND CLASS PROJECT REQUIREMENTS

Homework, mid-terms and quizzes should be answered in a concise and legible fashion. The class projects should be documented (electronically) in the form of a short paper structured in the following way:

1. Formulation of the problem
2. Literature review (very brief)
3. Description of the methodology proposed to solve the problem. This should include discussion of all the assumptions made.
4. Flow chart of the algorithm (if any) used.
5. Listing of the computer program. The program should be well documented by using the comments.
6. Presentation of the results including their discussion.
7. Final discussion including the main findings of the project, the limitations of the methodology used, and the recommendations for future research.

RECOMMENDED BOOKS

Primary Textbook: Physical Hydrology (Lawrence Dingman) ISBN – 0-13-099695-5 (Prentice-Hall). This book may not be followed on a strict basis as the course will involve extensive hand-outs. However, as a standard book for acquiring an understanding of both hydrology and meteorology, this is a recommended book to have.

OFFICE HOURS:

Monday 3.00-4.00 PM and/or by appointment (via email). Room: Prescott 332.

Email: fhossain@tntech.edu
Tel: 931-372-3257

COURSE URL: http://iweb.tntech.edu/fhossain/CEE6440.html

CEE 6430 Probabilistic Methods in Hydrosciences (FALL 2006)

For the skeptics who doubt this course:

With many calculations, one can win; with few one cannot. How much less chance of victory has one who makes none at all! --Sun Tzu 'Art of War'

For those who thought the course was very important in their lives:

There are three kinds of lies: lies, damn lies, and statistics. --Benjamin Disraeli

And The Verdict:

Far better an approximate answer to the right question, which is often vague, than an exact answer to the wrong question, which can always be made precise --John Tukey

BACKGROUND:

Real world problems include variables whose values are uncertain – example: rainfall at TTU campus on January 15, 2004; tomorrow's average temperature at Cookeville, Tennessee. Furthermore, most systems of interest to the engineer contain components whose response to certain input varies in time (dynamic) -example: the rainfall-runoff transformation of a hydrologic model. The probabilistic property of natural and man-made systems are most apparent (but not limited to) in the field of Hydrosciences (as the examples show). Such systems with dynamic components that contain uncertain parameters, variables, or accept uncertain input are commonly known as stochastic-dynamic systems.

OBJECTIVES: WHAT THIS COURSE PROVIDES

The course provides basic techniques for the analysis and synthesis of stochastic-dynamic systems with real-world applications. The material in this course can be used to solve three main classes of problems: (1) Estimation; (2) Prediction and (3) Optimal Control of systems that are observed remotely or directly. For example, consider the problem of *rainfall estimation from multiple satellites and ground radars*, the problem of *flood prediction*, and the problem of *optimal control of a multipurpose reservoir system.*

COURSE DELIVERABLES: THE NET 'GAIN' FOR THE STUDENT

Against a semester-long labor of staying awake during a 55 min lecture, the student can (hopefully) expect to understand the probabilistic concepts and appreciate their real-world application with particular focus on hydrological sciences. Additional (but not necessary)

outcomes may be an enhancement of the student's effectiveness in authoring and presenting market-quality research work to stay competitive.

PREREQUISITES

Beyond the basic course on elementary Statistics and Probability, students are expected to have working knowledge on computing (any language will suffice) and differential calculus.

MODUS OPERANDI: INSTRUCTIONAL FORMAT

Instruction will follow an essentially active learning format with basic concepts taught by providing real-world examples stressing assumptions. Difficult (and often sleep-inducing) theoretical derivations will be separated out in notes and avoided in class. Open-book mode of responding to grading exercises will be the most preferred method of evaluating progress of a student's understanding (no memorizing needed!). The lion share of the evaluation criteria will be based on assessing the student's capacity for independent thinking, creativity in identifying a real-world application of probabilistic concepts and clarity in presenting his ideas on a proposal. Hence, 50% of the grading will be based on a class project that is the student's most comfortable area of research. Work towards the class project will evolve on a regular one-to-one mentorship (bi-weekly) culminating in a 30 min end-semester presentation and a final report. Efforts will be made to train students in the art of delivering quality presentations to enhance their marketability at scientific meetings and job interviews.

GRADING POLICY

Homework: 25%
Quizzes and Class interaction: 20%
End-semester Class Project: 50%
(Don't try to add up, it won't, there is 'Uncertainty'!)

HOMEWORK AND CLASS PROJECT REQUIREMENTS

Homework and quizzes should be answered in a concise and legible fashion. The Class Project should be documented (electronically) in the form of a short paper structured in the following way:

8. Formulation of the problem
9. Literature review (very brief)
10. Description of the methodology proposed to solve the problem. This should include discussion of all the assumptions made.
11. Flow chart of the algorithm (if any) used.
12. Listing of the computer program. The program should be well documented by using the comments.
13. Presentation of the results including their discussion.
14. Final discussion including the main findings of the project, the limitations of the methodology used, and the recommendations for future research.

The document should be limited to about 10-15 pages of double-spaced text. It should be prepared neatly.

RECOMMENDED BOOKS

Text:

1. *Probability and Statistics for Engineers and Scientists* Walpole, Myers, Myers and Ye (Prentice Hall).
2. *Random Functions and Hydrology* – Bras and Rodriguez-Iturbe (Dover).
3. *Probability, Random Variables and Stochastic Processes*- Papoulis and Pillai (McGraw-Hill).

Other References (available for loan anytime from my office):
For Refreshing concepts on Probability and Statistics:

1. *Introduction to the Theory of Statistics* – Mood (McGraw Hill).
2. *Fundamentals of Proba*bility – Saeed Ghahramani (Prentice-Hall)

For Special Topics:

1. *On Error Propagation: Multivariate Error Analysis* – Clifford (Applied Science Publishers).
2. *On Monte Carlo Techniques*: A Primer for the Monte Carlo Method – Sobol (CRC Press).

OFFICE HOURS:

MWF 10.00-11:00 PM and/or by appointment (via email). Room: Prescott 332.
Email: fhossain@tntech.edu
Tel: 931-372-3257

COURSE URL: http://iweb.tntech.edu/fhossain/teaching.html

CEE 6300 – Multi-Scale Analysis of Concrete
Course Syllabus
Fall 2007

Instructor: Dr. Ben Mohr
Office: Prescott Hall 322
Office Hours: M-R 8:30-11:30am
Email: bmohr@tntech.edu
Phone: 931-372-3546

Course Website: http://iweb.tntech.edu/bmohr/CEE6300.htm
Lecture: TR 9:30-10:25 PM; Prescott Hall 330
Lab: TBD

Course Objectives:

- To present students with a comprehensive overview of basic principles relating to portland cement and concrete including microstructural development during hydration, mineral and chemical admixtures, fresh and hardened properties, durability, and special applications for concrete.
- To improve critical assessment.
- To improve written and oral technical communication skills.
- To integrate research and learning.

Course Materials:

Required Text:

S. Mindess, J.F. Young, D. Darwin, Concrete, Prentice-Hall, 2nd Edition, 2003.

Additional Reference Texts:

Design and Control of Concrete Mixtures, Portland Cement Association, 14th Edition, 2002.

P.K. Mehta, P. Monteiro, Concrete: Microstructure, Properties and Materials, McGraw-Hill, 3rd Edition, 2006.

A. Neville, Properties of Concrete, Longman, 4th Edition, 1996.

Lea's Chemistry of Cement and Concrete, P.C. Hewlett (Editor), John Wiley, 4th Edition, 1998.

H.F.W. Taylor, Cement Chemistry, Telford, 2nd Edition, 1997.

Course Requirements:

Exams:	45% (15% each)
First and second exams are not cumulative; Final exam is cumulative.	
Homework:	15%
Lab Reports:	25%
Project:	15%

You must pass each element to receive a passing grade in the course.

A = 90-100, B = 80-90, C = 70-80, D = 60-70, F = < 60

CEE 5660 Transportation Planning Fall 2006

Textbook: Transportation Engineering and Planning, 3rd edition by Papacostas, C. S. and P.D. Prevedouros
Reference: M.D. Meyer and E. J. Miller, Urban Transportation Planning, 2nd ed.

Goal: To introduce students to the planning of urban transportation systems.

Course Objectives
This course is intended to provide the student with the following:
1) The evolution of urban transportation planning in the US, and an understanding of current transportation planning issues and policies.
2) The regulations that govern the conduct of planning
3) An understanding of how to design and execute an urban transportation planning study; and
4) A working knowledge of transportation planning analysis skills, especially relating to travel demand and supply analysis, impact analysis, and the collection of survey data

Measurable Outcomes
1. Students should have an understanding of the historical development of urban transportation planning, and current legislation that guide the planning process.

2. Students should be able to distribute population and economic activity using the Potential and Putman Models respectively.

3. Students should know the different methods for conducting Origin-Destination surveys and Household Travel Behavior Surveys.

4. Students should be able to predict changes in modal patronage from demand elasticities.

5. Students should be able to predict the number of trips generated by a household using Cross-Classification Analysis, and Linear Regression Analysis

6. Students should be able to distribute trips originating from each zone using the biproportional method of updating, and the gravity model.

7. Students should be able to predict mode split using disaggregate multinomial logit model

8. Students should have an understanding of how vehicular traffic is assigned to a transportation network using system optimization, and user-equilibrium techniques.

9. Students should be able to assess the performance of transportation facilities – density, flow, travel speeds, occupancy, etc

10. Students should be able to predict the impacts of transport operations - noise levels and emissions from vehicular traffic operations on transportation facilities, and energy consumption.

11. Students should have an understanding of how transportation alternatives are evaluated.

Grading System:		
	Problem sets	20%
	Test # 1	12.5%
	Test # 2	12.5%
	Project	15%
	Term Paper + presentation	20%
	Final Exam	20%

- A ≡ 90 - 100, B ≡ 80 - <90, C ≡ 70 - < 80, D ≡ 60 - < 70, F ≡ < 60

Academic & Classroom Conduct:
Students are responsible for reading and complying with the current catalogue concerning class attendance and other student responsibilities in class.

ADA: Students with disabilities (as defined by the American with Disabilities Act) (ADA) should contact the instructor early in the semester or term regarding the accommodations necessary to complete the requirements of this course. The instructor will make reasonable adjustment to take into consideration the specific handicap of each student covered under the ADA.

NOTES:
1. Material presented in lectures may be included in exams even though it may not be in the reading assignments or handouts.
2. Solutions to assignments and project should be submitted in class on the stated due date. Any late submission of the solutions to an assignment or project will receive a zero mark.
3. **Cheating will not be tolerated. A mark of zero will be assigned to the entire project, or entire assignment if cheating is detected anywhere in the submitted document.**
4. **You will form small groups to work on some of the problem sets and the project**. The members of a group will be responsible for organizing themselves to complete the required tasks.
5. **Plagiarism**: When you summarize, paraphrase (put someone else's ideas into your words), quote, or borrow data from someone else, you must indicate your source. Failure to do so is plagiarizing. Students who plagiarize will receive a 0 for the assignment.

Course Outline

Topic	**Readings in Text**
Context for Urban Transportation Planning	Chapters 6, 7 & Notes
The Planning Process: Basic Definitions & Concepts	Notes
Urban Transportation System Characteristics & Planning Issues	Chapter 6& Notes
Land Use Forecasting: Potential Model & Putman's Model	Chapter 7 & Handout
Transportation Data Collection & Management	Chapter 4 Section 8 & Handout
Planning & the Decision-Making Process	Handout
Demand Analysis I: Basic Microeconomic Concepts; Simplified Methods; Trip Generation	Chapter 8 Section 7 Sec 8.2
Demand Analysis II: Trip Distribution	Sec. 8.3
Demand Analysis III: Modal Split	Sec. 8.4 & 8.6
Demand Analysis IV: Traffic Assignment	Sec. 8.5
Traffic Impact and Parking Studies	Chapter 9
Supply Analysis: Performance Measures, Costs & Impacts Noise Prediction Air Quality Energy Consumption Capacity Analysis: Basic Freeway Segments Capacity Analysis of Pedestrian Facilities Capacity Analysis of Transit Facilities	Chapter 4,10 & Handout
Evaluation: Process, Issues, & Methods	Chapter 11 & Handout

Test # 1: Monday October 9, 2006
Test # 2: Monday, November 20, 2006

Final Exam: Monday December 11, 2006 from 8:00 a.m. to 10:00 a.m.

Instructor: Dr. Daniel Badoe **Room**: PH 434 **Phone**: 372-3490 E-mail: dbadoe@tntech.edu
Office Hours: Normal working hours Monday - Friday

Web Page: http://gemini.tntech.edu/~dbadoe/ (select CEE 4660)

CEE 6470 – Transportation Demand Analysis

Fall 2007

Course Objective:
This course provides students with an in-depth treatment of the quantitative modeling of transportation demand for transportation planning purposes. The course principally deals with urban passenger demand, although intercity passenger demand models are also discussed. Topics addressed include theory of transportation demand, aggregate and disaggregate models, and an introduction to the activity-based approaches. An understanding of the theory of the demand for transportation is coupled with practical experience in the specification, estimation, and use of transportation demand models.

Prerequisites
1. Introductory course in probability and statistics
2. Transportation planning (CEE 4660/5660) – may be taken as a co-requisite with permission of instructor

Course Text: Modelling Transport, 3rd Edition by J. de D. Ortuzar and L. G. Willumsen

Reference books & journals include:
1. Transportation Demand Analysis (1983) by A. Kanafani
2. Discrete Choice Analysis (1985) by Ben-Akiva, M. and S. Lerman
3. Urban Transportation Planning 2nd edition (2001) by Meyer, M. and E. Miller
4. Transportation Research Record series on travel behavior and travel demand modeling
5. Urban Transportation Modeling and Planning (1975) by Stopher and Meyburg
6. NCHRP report 365 – Travel Estimation for Urban Planning
7. Any good introductory text on probability and statistics

Grading:

	Assignments	30 marks
	Term papers/project	50 marks
	Final Exam	20 marks

- A ≡ 90 - 100, B ≡ 80 - <90, C ≡ 70 - < 80, D ≡ 60 - < 70, F ≡ < 60

Note: Solutions to problem sets, term papers, and project-reports should be submitted at the beginning of class on the stated due date. Late submission of solutions to a problem set, term paper, or project-report will result in the submission being assigned a mark of zero.

Academic & Classroom Conduct:
Students are responsible for reading and complying with the current catalogue concerning class attendance and other student responsibilities in class.

ADA: Students with disabilities (as defined by the American with Disabilities Act) (ADA) should contact the instructor early in the semester or term regarding the accommodations necessary to complete the requirements of this course. The instructor will make reasonable adjustment to take into consideration the specific handicap of each student covered under the ADA.

Instructor: D. A. Badoe **Office**: PH 434 **Phone**: 372-3490 **E-mail**: dbadoe@tntech.edu
Office Hours: Normal working hours

Topics

1.	Probability theory	Chapter 2: Sec.5
2.	Multiple regression analysis	Chapter 4: Sec.2
3.	Microeconomic demand theory	Notes
4.	Trip Generation Modelling	Chapter 4

5.	Trip Distribution Modelling	Chapter 5
6.	Modal Split and Direct Demand Modelling	Chapter 6
7.	Discrete Choice Models (Binary & Multinomial Logit) – Theory	Chapter 7
8.	Discrete Choice Models (Binary & Multinomial Logit) – Estimation	Chapter 8
9.	Traffic Assignment	Chapter 10
10.	Time of Day Modeling	Notes
11.	Travel Surveys	Chapter 3
12.	Intercity Passenger Demand	Notes
13.	Introduction to activity-based approach to travel demand modelling	Notes

Details of the term papers/project and final exam will be provided in subsequent documentation.

Final Exam: Wednesday December 12, 2007, from 10:30 a.m. to 12:30 p.m.

CEE 4700/5700 Masonry Design Spring 2007

INSTRUCTOR: Dr. Craig Henderson, P.E.
Office: PH 417; Phone: 372-3062; E-mail: chenderson

TEXT:
1. *ACI 530-02 Building Code Requirements for Masonry Structures*
2. *Masonry Course Notes, Henderson, 2007.*
3. *Design of Reinforced Masonry Structures 13th Ed.*, Taly, 2004.

PREREQUISITES: CEE 4320

ATTENDANCE: Class attendance and participation is required. Students who miss class usually fail. Absence from a test without prior approval of the instructor will normally result in a grade of zero on that test. Make-up tests will be given only in properly documented cases of serious illness, or emergency, or unavoidable contingency.

TEACHING METHOD: The course is taught by lectures, which include example problems similar to the assigned homework problems.

OBJECTIVES:
1. Understand masonry terminology and be able to converse in written and oral format about testing, analysis, design, and construction.
2. Understand the principles of masonry construction and typical configurations of masonry buildings and sub-assemblies.
3. Be capable of the analysis and design of typical masonry elements including columns, beams, lintels, and walls to resist structural forces.

CLASS CONDUCT: Professional behavior is expected (i.e., students must be on time, refrain from talking during lecture, be attentive and participate).

HOMEWORK: Homework is due at the *BEGINNING* of the class period on the dates assigned in class and will *not* be accepted late. Quizzes will often be given at the start of class, and for grading purposes, will be considered as homework. Neatness is important and your work will be graded accordingly. Homework *must* be completed on engineering paper and follow a *GIVEN, REQUIRED,* and *SOLUTION* type format. Homework will *not* be graded that fails to comply with these guidelines.

GRADING DISTRIBUTION: Homework = 12%; 3 tests = 21% each; final exam = 25%

SCALE: D = 62-71; C = 72-81; B = 82-91; A = 92-100

ADA PROVISIONS: 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.

CEE 5700
Graduate Student Project

Required:

Create a design notebook containing examples of each type of problem worked in CEE 5700. There will be seven sections as follows:

1. Beams (flexure) using WSD
2. Beams (shear) using WSD
3. Beams (flexure) using USD
4. Reinforced walls – fully-grouted (flexure)
5. Reinforced walls – partially-grouted (flexure)
6. Unreinforced wall (flexure and axial)
7. Unreinforced walls (shear)
8. Reinforced walls (shear)
9. Columns
10. Seismic Design

Each section should be separated by a tab and contain the following:

- One-page hand-worked example
- One-page MathCad or Excel design tool
- One-page write-up on how to use the design tool (input, assumptions, etc.) and an outline of the pertinent sections of the code

CEE 7520 Fluvial Hydraulics

Catalog Data: CEE 6420: Fluvial Hydraulics. Lecture 3. Credit 3. Advanced topics; fundamental principles, theories and analytical methods applied in open-channel hydraulics, sediment transport mechanics and fluvial morphology. Prerequisites: CEE 6520 or consent of instructor.

Textbook: Howard H. Chang, Fluvial Processes in River Engineering, Krieger Publishing, Malabar, Florida, Reissue 1998 with minor corrections.

Reference: None

Coordinator: V. S. Neary, Associate Professor of Civil & Environmental Engineering

Goals: To give the student proficiency in formulating and solving a number of engineering problems in open channel hydraulics, sediment transport and fluvial morphology.

Prerequisites by topic:
Open channel hydraulics (CEE 6520) or Consent of Instructor

Topics:

1. River Morphology (4 class hours)
2. Hydraulics of Flow in Streams & Rivers (5 class hours)
3. Physical Properties of Sediment (3 class hours)
4. Initiation of Motion (3 class hours)
5. Alluvial Bed Forms and Flow Resistance (4 class hours)
6. Sediment Transport in Streams & Rivers (6 class hours)
7. Sediment Transport in Pipes (4 class hours)
8. Design of Stable Alluvial Channels (3 class hours)
9. Analytical River Morphology (3 class hours)
10. Sediment Field Measurements (3 class hours)
11. Tests (4 class hours)

Total Class hours for 1 semester = 45 hours, where 1 class hour = 55 minutes

Computer usage:

1. Most homework assignments will require use of Microsoft Excel

CEE 6750 Environmental Modeling

Catalog Data: CEE 6750 Environmental Modeling Lec. 3. Credit 3.
Prerequisite: CEE 4450 and 6610 or consent of instructor. Mathematical modeling of single medium and multimedia environmental systems. Applications to natural and engineered systems.

Textbook: Schnoor, Environmental Modeling, J. Wiley & Sons, 1996.

Reference:

Ramaswami, Milford & Small, Integrated Environmental Modeling, Wiley, 2005.
Hemond and Fechner-Levy, Chemical Fate and Transport in the Environment, 2nd Ed., Academic Press, 2000.
Weber, Environmental Systems and Processes, Wiley, 2001.

Coordinator: Lenly Weathers, Associate Professor of Civil and Environmental Engineering

Goals: To provide an fundamental understanding of the development of mathematical models of multimedia environments.

Prerequisites: CEE 4450 and CEE 6610

Topics Covered

1. Introduction (1 hour)
2. Transport Fundamentals (3 hours)
3. Chemical Reaction Kinetics (2 hours)
4. Equilibrium Chemical Modeling (6 hours)
5. Numerical Methods (3 hours)
6. Toxic Organic Chemicals (5 hours)
7. Modeling Trace Metals (5 hours)
8. Models of Transport in Air (5 hours)
9. Models of Transport in Soil and Groundwater (5 hours)
10. Models of Transport in Surface Water (5 hours)
11. Tests (2 hours)
    Total: 42 hours

Computer Usage:

1. Spreadsheet applications.
2. Internet/word processing applications for project reporting

CEE 4430 (5430) – Water and Wastewater Engineering
Spring Semester 2007

2000 Catalog Data: CEE 4430 (5430): Water and Wastewater Engineering Lecture 3. Credit 3.. Unit operations and processes for water and wastewater treatment. Quantities and characteristics of water and wastewater. Prerequisite: CEE 3410 or consent of instructor.

Textbook: Reynolds, T.D. and Paul A. Richards, *Unit Operations and Processes in Environmental Engineering,* PWS Publishing Company, Boston, Second edition, 1996.

Reference:
AWWA, *Water Treatment Plant Design,* Second edition, 1990.
Crites, R. and G. Tchobanoglous, Small & Decentralized Wastewater Management Systems, 1998.

Coordinator: L.J. Weathers, Associate Professor of Civil Engineering

Prerequisites by topic:
1. Water treatment operations
2. Wastewater treatment operations
3

Goal: The goal of CEE 4430 (5430) "Water and Wastewater Engineering" is to develop the student's ability to design potable water and wastewater treatment systems.

Topics covered:

1. Chemistry review (1 class)
2. Reactor theory (1 class)
3. Water and wastewater quantity and quality (1 class)
4. Water and wastewater treatment overview (1 class)
5. Water treatment processes and design (10 classes)
6. Wastewater treatment processes and design (9 classes)
7. Solids handling (1 class)
8. Tests/review (4 class)

CEE 4420/5420 ENGINEERING HYDROLOGY
(FALL 2007)

Instructor: Dr. Faisal Hossain

DESCRIPTION

Fundamental principles of engineering hydrology with application to runoff modeling in catchments

COURSE OBJECTIVES

Essential Objective: To provide an up to date background on engineering hydrology with special emphasis on runoff modeling for water resources management.
Secondary Objective: To gain factual knowledge on terminology and use of methods of engineering hydrology; Learn how to apply course material to specific engineering hydrology problems.

REQUIRED TEXT

1. Gupta, R. S., Hydrology & Hydraulic Systems, Second Edition, Waveland Press, Inc., Prospect Heights, Illinois, 2001.

ADDITIONAL TEXT FOR 5000 LEVEL STUDENTS

2. Hornberger, G.S. et al. Elements of Physical Hydrology, Johns Hopkins University Press, 1998.

PREREQUISITES

CEE 3420 Hydraulics (Required) or consent of the instructor

MAJOR TOPICS COVERED

Estimating Water Budgets, Calculating Transfer Processes in the Hydrologic Cycle, Unit Hydrograph Techniques for Midsized Catchments, Reservoir Routing Techniques for Large Catchments.

COURSE FORMAT

This semester an attempt will be made to adopt a teaching style that balances among lectures, reading assignments, homework and quizzes. Discussions will be driven mainly through extensive homeworks, quizzes and exams. The reading assignments will be essentially based on the Text book. Additional reading material may be provided. Reading assignments will be designed so that students can be better prepared to interact during class discussions. There will be about 6-8 sets of extensive homeworks, almost all of which will be based on problems provided in the Textbook. Homework WILL be graded, hence, doing it legibly and on time strongly encouraged. NO LATE HOMEWORK WILL BE ACCEPTED.

Solutions for all assigned homework problems will be posted on the bulletin board outside PH330 or e-mailed.

ADDITIONAL REQUIREMENT FOR 5000 LEVEL STUDENTS

Students of CEE5420 will be required to complete a class project requiring 1 hour per week of effort during the semester. The project will be graded on the basis of a final project report and a class presentation.

EXAMS

There will be 3 exams (2 mid-terms, one final), punctuated with about 4-5 quizzes. All exams will be open book and open notes.

GRADE PERCENTAGES

For CEE4420
Homework - 40%
Exams - 50%
Class Participation and Quizzes -10%

For CEE5420
Homework – 25%
Exams – 35%
Class Project – 30%
Class Participation and Quizzes – 10%

CEE 4440 WATER RESOURCES ENGINEERING
SPRING 2005

Instructor: Dr. Faisal Hossain
E-Mail: fhossain@tntech.edu
Time & Place: Tues-Thurs 3.00-4.20 PM; PH 325
Office Phone: 372-3257; Office Location: PH332
Office Hours: Fri 1-5 pm (or by appointment)

Description

Application of engineering principles to problems related to planning, design and management of river-reservoir systems

Main Text

Linsley et al., Water-Resources Engineering, McGraw-Hill, Inc., New York, 4th edition, 1992.

Course Objectives

This course is designed to provide you with an up to date background for planning, design and management of river reservoir systems (some examples are: flood-damage reduction and hydropower). It treats important aspects involved in planning these systems (probability concepts, water law, engineering economy and simulation modeling).

Prerequisites

CEE 3420 Hydraulics (Required)
CEE 4420 Engineering Hydrology (Recommended)

Topics Covered

Descriptive and Quantitative Hydrology, Probability Concepts in WRE Planning, Water Law, Engineering Economy in WRE Planning, Simulation Modeling of River-Reservoir Systems. Reservoirs, Turbines, Hydroelectric Power, Flood-Damage Mitigation, Planning for WRE.

Course Format

This semester an attempt will be made to adopt a teaching style that balances among lectures, reading assignments, homework, quizzes and mini projects. Discussions will be driven mainly through extensive homeworks and mini projects.

Lectures

Lectures will be kept to the minimum necessary, but will be provided on an as-needed basis. Typically, the Tuesday of each week will be reserved for lectures and giving students an overview of each topic, the learning objectives and expectations in terms of homework and projects. The Thursdays of each week shall be reserved for homeworks and project assistance where more informal discussions and class participation will take place. Powerpoint lecture notes will be provided with the start of each new topic. These notes will help you to gauge what subtopics are being emphasized in your reading assignment.

Reading Assignments

The reading assignments will be essentially based on the Text book. Additional reading material may be provided. Reading assignments will be designed so that students can be better prepared to interact during class discussions.

Homework

- There will be about 6-8 sets of extensive homeworks, almost all of which will be based on problems provided in the Textbook.
- Homework WILL be graded, hence, doing it legibly and on time strongly encouraged. NO LATE HOMEWORK WILL BE ACCEPTED.
- Solutions for all assigned homework problems will be posted on the bulletin board outside PH330 or e-mailed.

Mini Projects

There will be about 4 mini projects. The last one will require a class presentation (25 mins). Mini Project reports unless otherwise instructed will consist of the following parts to supplement the certain homework problems: Title Page (with names and date); Objectives; Methods; Results. Figures and tables must be referenced in text. Depending on the level of difficulty of the mini projects work may be allowed to be done in groups of 2-3 students.

Exams

There will be 2 exams (1 mid-term, one final), punctuated with about 4-5 quizzes. All exams will be open book and open notes.

Groups

You are encouraged to work in groups on homework and project assignments. For mini projects, you may be divided into groups of 2 or 3. Those members not contributing will either be reassigned, work on their own, or have their grades reduced based on their group member grades.

Grade Percentages

Homework - 30%
Exams – 40%
Mini Projects-20%,
Class Participation and Quizzes -10%

CEE 4610 / 5610	Pavement Design	Fall 2007

Goal:
To familiarize the student with the techniques and materials used in design, construction and rehabilitation of flexible and rigid pavements.

Objectives:

1. To familiarize the student with properties, specifications, and test methods for pavement subgrades, subbases, bases, and surface courses for flexible and rigid pavements.

2. To show how material selection, design decisions, and the construction process influence pavement stresses, strains, and durability which in turn control distress mode and severity for flexible and rigid pavements.

3. To expose the student to the American Association of State Highway and Transportation Officials (AASHTO), National Asphalt Pavement Association (NAPA), Asphalt Institute (AI), California Bearing Ratio (CBR), and typical sections methods of flexible pavement design.

4. To expose the student to the AASHTO, Portland Cement Association (PCA), Tennessee Ready Mixed Concrete Association (TRMCA), ACI 330 and typical sections methods of rigid pavement design.

5. To introduce the students to the basic concepts of pavement management, pavement maintenance, and pavement recycling. The introduction will include five or more techniques for flexible and rigid pavement overlay design.

Measurable Outcomes:

1. The student will be able to discuss properties, specifications, and test methods for pavement subgrades, subbases, bases, and surface courses for flexible and rigid pavements.

2. The student will be able to identify pavement distress types and list probable causes. Further, the student will be able to calculate stresses and strains developed in flexible and rigid pavements and evaluate their effect on pavement performance.

3. The student will be able to design flexible pavements by the AASHTO, NAPA, AI, CBR, and typical sections methods.

4. The student will be able to design rigid pavements by the AASHTO, PCA, TRMCA, ACI 330 and typical sections methods.

5. The student will be able to design overlays for rigid and flexible pavements by several methods and be familiar with pavement management and pavement maintenance basic

concepts.

Required Text: Principles of Pavement Design, 2nd Ed. Yoder & Witzack

References: TBA

Grades:

Exam 1, 2, (each)	30%
Final Exam (Partially Comprehensive)	30%
Homework	10%

Notes:

(1) Material covered in "Required Texts" reading assignments, handouts and references assigned in class may be included in exams even though it may not have been covered in class.

(2) Material presented in lectures may be included in exams even though it may not be in the reading assignments or handouts.

(3) No make-up exams will be given without a pre-approved excuse, which will be submitted in writing to the instructor.

(4) Late homework will not be accepted.

(5) All students must have a homework average > 60 to pass.

(6) A = 90-100, B = 80-89, C = 70-79, D = 60-69, F = < 60

(7) Attendance is required. -1 class average point per day missed. Tardiness counts as an absence. In addition, students are responsible for reading and complying with the current catalog concerning conduct in class.

(8) Students with disabilities (as defined by the Americans with Disabilities Act) (ADA) should contact the instructor early in the semester or term regarding the accommodations necessary to complete the requirements of this course. The instructor will make reasonable adjustment to take into consideration the specific handicap of each student covered under the ADA.

(9) Additional work in the form of a term paper, presentation, computer modeling exercise or laboratory project on a subject chosen in consultation with the instructor will be required for graduate credit.

Instructor: L. K. Crouch, PH 316 Phone: 372-3196 e-mail: lcrouch@tntech.edu

Office Hours: TBA

CEE 4600/5600	Civil Engineering Materials II	Spring 2006

Goal:

To familiarize the student with the techniques used in design and adjustment of high strength PCC, flowable fill, pervious concrete and PCC formwork. To further familiarize the student with masonry materials evaluation and aggregate production and improvement. To introduce SCC and RCC to the student.

Objectives:

- To familiarize the student with some design and adjustment procedures for high-strength PCC, SCC, RCC, flowable fill, and pervious concrete.
- To familiarize the student with some ACI design and analysis techniques for PCC formwork.
- To further familiarize the student with several ASTM techniques for evaluating masonry materials.
- To further familiarize the student with aggregate production and improvement.

Measurable Outcomes:

In specific, students will be expected to:

1. Be able to design and adjust mixture designs for high-strength PCC, flowable fill, and pervious concrete.
2. Be able to discuss the basics of SCC and RCC
3. Be able to design and analyze PCC formwork.
4. Be able to perform several ASTM laboratory evaluations of masonry materials.
5. Be able to discuss aggregate production and improvement.

Required Texts:

Basic Construction Materials, Marotta, 7th edition

References: TBA

Grades:

Test 1	25%
Final (Comprehensive)	35%
Homework	10%
Lab Reports	10%
Lab Masonry Presentation	20%

Instructor: L. K. Crouch PH 316 372-3196 lcrouch@tntech.edu

CEE/ME 4190/5190 Advanced Mechanics of Materials Fall 2007

Class Schedule: MWF 9:05 – 10:00 am PH 425

Instructor: Dr. Y. Jane Liu, Associate Professor of Civil Engineering
Office: PH 432; Phone: 372-3256; email: jliu@tntech.edu

Office Hours: **Tuesday and Thursday 1:30 – 2:30** Feel free to call or email me, or by appointment.

Textbook: ***Advanced Mechanics of Materials***
Arthur P. Boresi, Richard J. Schmidt, 6th Edition, John Wiley & Sons, Inc., 2003

Prerequisites: CEE3110: Mechanics of Materials and Math 2120: Differential Equations

Objectives: To provide students the basic theoretical background to understand the mechanics behaviors of engineering solids and introduce the fundamental analysis approaches to the solids. The anticipated topics are 1) the basic concept of the three-dimensional stress and strain and the relationships between strain and displacement and stress and strain; 2) constitutive equations for isotropic and anisotropic materials and equations of elasticity; 3) classical failure theories; 4) the fundamental concept of energy methods; 4) non-symmetrical bending of straight beams, thin walled beams, curved beams, and beams on elastic foundations, 5) torsion of noncircular cross sections; 6) application to plates and shells; 7) elastic instability; 8) introduction to MAPLE (Symbolic-computation System).

Attendance: Class attendance and participation is required. Absence from a test without prior approval of the instructor will normally result in a grade of zero on that test. Make-up tests will be given only in properly documented cases of serious illness, or emergency, or unavoidable contingency. Professional behavior is expected (i.e., students must be on time, refrain from talking during lecture, be attentive and participate).

Homework: Homework will be assigned in the class and the assignments will be completed within seven to ten days, depending on the individual assignment. Neatness is important and your work will be graded accordingly. Homework must be completed on engineering paper, one side only and follow a ***GIVEN***, ***REQUIRED***, and ***SOLUTION*** type format. Diagrams should be drawn neatly using a straight edge. Homework will ***NOT*** be graded that fails to comply with these guidelines. **Late homework and project will NOT be accepted.**

Project: This is for the graduate students registered in the CEE/ME5190. The subject of the course project will be determined based on the student's interest, and the topic should be in the general area of the course. The project should include basic theoretical background, a review of published research findings, comparisons of the solutions, discussion and conclusions. Each graduate student will discuss a preliminary project outline with the instructor after setting up an appointment. The results of the project will be presented in form of an oral presentation and submitted in a report in the last week.

Grading: Homework = 25%;
Exam1 = 20%;
Exam2 = 25%;
Project and Presentation = 20% (for graduate students);
Comprehensive Final = 30%

Scale: **A** = 100-90; **B** = 89-80; **C** = 79-70; **D** = 69-60

*Extra credits 2 points for the homework neatness, all assignments turned in on time and class participation.

Reference: ***Foundation of Solid Mechanics*****,** Y. C. Fung, Prentice-Hall, 1965

Advanced Strength and Applied Stress Analysis, Richard G. Budynas, 2nd Edition, McGraw-Hill, 1999

Advanced Mechanics of Materials, Roman Solecki, R. Jay Conant, Oxford University Press, 2003

Intermediate Mechanics of Materials, J. R. Barber, McGraw-Hill, 2001

Stresses in Plates and Shells, Ansel C. Ugural, 2nd Edition, McGraw-Hill, 1999

ADA Provisions: "Students with disabilities (as defined by the Americans with Disabilities Act) [ADA] should contact the instructor early in the semester or term regarding the accommodations necessary to complete the requirements of this course. The instructor will make reasonable adjustments to take into consideration the specific handicap of each student covered under the ADA.

CEE 7720/ME7670 Fiber-Reinforced Composite Materials
(Spring 2006)

Class Schedule: MWF 1:25 – 2:20 pm PH 228

Instructor: Dr. Y. Jane Liu, Assistant Professor of Civil Engineering
Office: PH 432; Phone: 372-3256; email: jliu@tntech.edu

Office Hours: **Tuesday and Thursday 12:00 – 1:30 pm**. Feel free to call or email me, or by appointment.

Textbook: ***Stress Analysis of Fiber-Reinforced Composite Materials***,
Michael W. Hyer, 1st Edition

Reference: ***Fiber-reinforced Composites,*** P. K. Mallick, 2nd Edition

Practical Analysis of Composite Laminates, J. N. Reddy,
A. Miravete
Mechanics of Composite Materials, Pobert M. Jones, 2nd Edition

Prerequisites: Basic knowledge of Structural Mechanics and CEE 3110 Mechanics of Materials.

Objectives: To introduce the basic concept of composite materials and, provide the basic theoretical background to understand the mechanics behaviors of composites and fundamental analysis approaches to design of composite materials. To familiarize students with using Maple package and Finite Element Analysis software (ANSYS) in composite structure analysis.

Homework: Homework will be assigned in the class and the assignments will be completed within seven to ten days, depending on the individual assignment. **Late homework and project will NOT be accepted.**

Project: The topic of the project should be in the general area of the course (composite materials and structures) and include basic theoretical background, a review of published research findings, comparison of theoretical prediction and experimental results (optional but recommended), discussion and conclusions. Each student will discuss a preliminary project outline with the instructor after setting up an appointment. The results of the project will be presented in form of an oral presentation and submitted in a report in the last week.

Grading: Homework = 25%;
Mid-term = 25%;
Project and Presentation = 25%;
Comprehensive Final = 25%

Scale: **A** = 100-90; **B** = 89-80; **C** = 79-70; **D** = 69-60

ADA Provisions: **ADA Provisions:**"Students with disabilities (as defined by the Americans with Disabilities Act) [ADA] should contact the instructor early in the semester or term regarding the accommodations necessary to complete the requirements of this course. The instructor will make reasonable adjustments to take into consideration the specific handicap of each student covered under the ADA."

CEE 4410/5410
Solid and Hazardous Waste Management
Fall 2005

Instructor: Dr. Lenly J. Weathers
e-mail: lweathers@tntech.edu; PH 318; Tel: 372-6539
Classroom: PH 330
Day/time: TR 9:30 – 10:50 AM
Textbooks: "Hazardous Waste Management" by LaGrega, Buckingham and Evans, 2nd Ed., McGraw-Hill.
"NIOSH/OSHA/USCG/EPA/ Occupational Safety And Health Guidance Manual For Hazardous Waste Site Activities," available at http://www.cdc.gov/niosh/publistc.html
Prerequisites: CEE 3410
Office Hours: Open door.

Goal: The goal of this course is to learn the basic principles of hazardous waste management by building upon basic environmental engineering developed in CEE 3410 "Introduction to Environmental Engineering".

Course objectives: At the end of this course, students are expected to:

1. Understand the key regulations governing hazardous waste management.
2. Be able to mathematically predict the transport of chemicals in the subsurface and in the atmosphere.
3. Understand industrial hygiene as it relates to hazardous waste site operations, including the basics of toxicology; hazard recognition; proper personal protective equipment and respiratory equipment; and monitoring.
4. Understand the basics of quantitative risk assessment.
5. Understand specific methods for the treatment and disposal of hazardous waste.

Grading policy:

Component	Tentative Date		%
Homework, report and presentation			20
Tests (3 @ 20%)			60
Final exam	10:30 - 12:30	Monday, Dec 12	20

Note: Additional assignments will be assigned for CEE 5410.

Tentative Final Grade Assignments
A (90-100), B (80-90), C (70-80), D (60-70), F (<60)

Each student is expected to work independently on all exams. Students may neither give nor receive assistance on exams. All written material, including homework, term papers, etc., must be the student's original work. The professor will establish the bounds of original work and the degree of collaboration that will be allowed in this class. The work(s) of others may only be used with proper reference or acknowledgement. Failure to adhere to this policy can result in the receipt of a failing grade, suspension or dismissal from the University.

CEE 7310

Hazardous Waste Remediation in Groundwater and Soil

Instructor: Dr. Lenly J. Weathers; e-mail: lweathers@tntech.edu
PH 439; Tel: 372-6539

Classroom: PH 325
Day/time: TR 9:30 – 10:50 AM
Textbooks: "Contaminant Hydrogeology" by Fetter, 2nd Ed., Prentice-Hall.
Prerequisites: CEE 3410 or equivalent.
Office Hours: Open door.

Goal: The goal of this course is to learn the basic principles of (1) the fate and transport of contaminants in the subsurface, and (2) the remediation of contaminated soil and groundwater.

Grading policy:

Component	%
Homework	20
Report and class presentation	10
Tests (2 @ 20%)	40
Final exam	30

Tentative Final Grade Assignments

A (90-100), B (80-90), C (70-80), D (60-70), F (<60)

Course Topics

- Introduction
- Mass Transport in Saturated Media
- Transformation, Retardation and Attenuation of Soluted
- Flow and Mass Transport in the Vadose Zone
- Multiphase Flow
- Inorganic Chemicals in Ground Water
- Organic Compounds in Ground Water
- Ground-Water and Soil Monitoring
- Site Remediation

Other texts and references that serve as sources for supplementary lecture materials:

- "Physical and Chemical Hydrogeology" by P. Domenico and F. Schwartz, 2nd edition (1997)
- "Groundwater" by R. Freeze and J. Cherry (1979)
- "Ground Water Contamination: Transport and Remediation" by P.B. Bedient, H.S. Rifai and C.J. Newell (1999)
- "Fundamentals of Hazardous Waste Site Remediation" by K. Sellers (1999)
- "Groundwater Hydraulics and Pollutant Transport" by R.J. Charbeneau (2000)

Each student is expected to work independently on all exams. Students may neither give nor receive assistance on exams. All written material, including homework, term papers, etc., must be the student's original work. The

professor will establish the bounds of original work and the degree of collaboration that will be allowed in this class. The work(s) of others may only be used with proper reference or acknowledgement. Failure to adhere to this policy can result in the receipt of a failing grade, suspension or dismissal from the University.

CEE 6610
Applied Environmental Chemistry
Fall Semester 2007

Instructor: Dr. Lenly J Weathers Email: lweathers@tntech.edu
Location-- PH 318 Phone: 372-6539
Office Hours: "Anytime" or by appointment

Textbook: Jensen, "A Problem Solving Approach to Aquatic Chemistry," Wiley.

Course Objectives
- To develop an understanding of the chemical processes occurring in natural waters and in water and wastewater treatment systems.
- To learn commonly used methods of analysis.

Grading

Homework assignments	20%
Lab reports	10%
Hour exams (2)	40%
Final exam	30%

Homework and Lab Report Policy
- No late homework will be accepted.
- Lab reports will be due one week after the lab has been conducted.

CEE 6780 – Environmental Engineering Laboratory
Fall 2006

Instructor: Dr. Lenly J. Weathers
Prescott Hall 318
372-6539, lweathers@tntech.edu
Office hours – anytime

Class Schedule: TBA

Course Purpose
The purpose of this course is 1) to familiarize students with laboratory techniques that are commonly used in water quality analysis, 2) to reinforce theoretical water chemistry concepts, and 3) to provide students with hands-on experience in taking and interpreting data from processes used in biological wastewater treatment.

Course Objective
Upon completion of the course, the student should:
1. Know lab safety.
2. Know the definitions of the major water quality parameters.
3. Know laboratory methods to determine the major water quality parameters.
4. Understand acid-base phenomena, alkalinity and buffering.
5. Know how to determine biokinetic coefficients, including yield, maximum specific substrate utilization rate and maximum specific growth rate.

Grading
Laboratory Reports: 220 points
Class presentation: 20 points
Total: 240 points
A= 100-90% B= 90-80% C= 80-70% D= 70-60% F= below 60

Note: Lab experiments may be conducted by a group of no more than three individuals, but each student must turn in a separate lab report.