Environmental Sciences PhD Student and Faculty Handbook



Fall 2026 Edition

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Introduction

Welcome to the School of Environmental Studies' (SOES) *Student and Faculty Handbook* for the Environmental Sciences PhD program. The handbook has been reviewed and approved by the EVS Executive Committee in March 2025 and will be regularly updated as new materials and policies become available. Please see the contact list at the end of this document and please feel free to reach out to SOES faculty and staff with any updates, suggestions, or questions.

Mission Statements

- School of Environmental Studies
    - The School of Environmental Studies will foster in students the desire to lead purposeful professional lives through the application of scientific principles to environmental issues within the social, political, and economic framework of our society.

- Environmental Sciences Ph.D. Program
    - The Environmental Sciences doctoral program's mission is to advance the knowledge and promote the leadership necessary to understanding natural environments by incorporating perspectives from social sciences, humanities, and environmental sciences in the program's teaching and research in the fields of natural resources and the environment.

Student Learning Outcomes

The EVS Ph.D. program has three program goals as detailed below. Student learning outcomes and assessment methods are associated with each of these goals. Assessment occurs throughout the year and results are summarized in an annual Institutional Effectiveness report that is presented to the EVS Executive Committee typically during the fall semester. The executive committee reviews the results and makes recommendations for any changes as needed.

Program Goal 1: Environmental Sciences students will receive detailed interdisciplinary training and experience to enable them to address complex environmental problems with greater effectiveness.

- Student Learning Outcome 1.1. EVS students will demonstrate understanding of the interdisciplinary nature of environmental sciences such that they are aware of a wide range of environmental concerns beyond the boundaries of any single, specific discipline.
    - Assessment Method for Student Learning Outcome 1.1. Written and Oral Comprehensive Exams. Also, the dissertation research project is evaluated by an interdisciplinary team (the student's graduate advisory committee) although this is currently not assessed within the formal Institutional Effectiveness framework.

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Program Goal 2: EVS student research projects will be peer-reviewed and widely recognized for their innovation and relevance to environmental concerns.

- Student Learning Outcome 2.1. Students will improve oral and written communication skills by giving technical presentations at symposia, conferences, and similar venues where abstracts are peer-reviewed for acceptance.
    - Assessment Method for Student Learning Outcome 2.1. Student Annual Reports (number of poster and platform technical presentations given).
- Student Learning Outcome 2.2. Students will improve written communication skills by submitting manuscripts to peer-reviewed publications such as scholarly journals, conference proceedings, books, or similar outlets.
    - Assessment Method for Student Learning Outcome 2.2. Student Annual Reports (number of manuscripts submitted and accepted for publication).

Program Goal 3: Add new concentrations to the Environmental Sciences PhD program.

- Student Learning Outcome 3.1. Students will be exposed to a wide diversity of interdisciplinary topics by interacting with students and faculty in multiple concentrations within environmental sciences.
    - Assessment Method: Annual count of number of concentrations within the EVS Ph.D. program.

Admissions and Recruiting

Applying to be admitted into the EVS program entails completing an online application through the College of Graduate Studies webpage and paying an application fee ($35 for domestic applicants and $40 for international applicants). The applicant uploads previous college transcripts and other materials and also provides names and contact information for three references who are automatically contacted and invited to upload letters of recommendation. Admission to the program is based on the applicant's prior academic record, letters of recommendation, and related materials. The GRE requirement for EVS applicants was recently eliminated; however, three reference letters are required. In the EVS-Chemistry concentration, a curriculum vita and cover letter are also required components of the application materials. SOES faculty member Dr. Tammy Boles serves as the EVS admissions coordinator, and she responds to many prospective-student inquiries in this capacity. Tennessee Tech uses the Slate system for managing graduate applications. Each of the EVS concentrations has two faculty reviewers, and Dr. Tammy Boles serves as the head reviewer to make the final admissions decision.

Certain EVS concentrations have more specific requirements than those listed above. For example, admission to the EVS-Biology concentration requires applicants to have a bachelor's or master's degree in a biological science and a grade point average ≥ 3.5 (4.0 scale) for the highest degree earned; furthermore, a graduate faculty member must have agreed to direct the student's doctoral program and financial support must have been identified for a stipend and for research needs (verified through completion of a graduate advisor acceptance form signed by the

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applicant and Biology faculty advisor). EVS-Agriculture, EVS-Geosciences, and EVS-Integrated Research applicants also are required to identify a willing faculty advisor in advance and then complete an advisor acceptance form as part of the application materials. EVS-Chemistry applicants must have a bachelor's or master's degree in science, mathematics, engineering, or environmental science, as well as a grade point average of ≥ 3.0 (4.0 scale), but they do not need to have an advisor acceptance form because they spend time during their first semester doing informal lab rotations that help them identify a suitable advisor for their dissertation research.

Faculty participating in the EVS program play an important role in recruiting new students. Faculty can develop announcements or postings to display in online locations (professional society job boards, etc.). An announcement from a faculty member in the EVS-Agriculture concentration is included here as an example. Note how the wording indicates that the assistantships are awarded on a competitive basis, and does not make any promises or guarantees of assistantship support.

Graduate assistantships – Precision Agriculture

Dr. Abdul Momin in the School of Agriculture at Tennessee Tech University is recruiting a graduate student to work on geo-spatial technologies coupled with artificial intelligence for precision agriculture beginning in either Spring, Summer, or Fall 2024 semester.

Students with agricultural engineering background and experience on application of geo-spatial technologies and machine learning are especially encouraged to apply. Graduate assistantships are available on a competitive basis through the Professional Science Master's degree program in Environmental Informatics and the Environmental Sciences-Agriculture PhD program. Please send the following documents as PDF-files electronically to momin@tntech.edu by October 01, 2023.

1. CV
2. Cover letter: 1-2 pages where you:
    - Introduce yourself
    - Describe your previous research fields and main research results
    - Relate your qualifications, experience, and skills with the position requirements
    - Describe your future goals and future research focus on precision agriculture
3. Name and email contact information for three references who will be contacted via email to provide a letter
4. Copies of academic transcripts

Types of Assistantship and Fellowship Awards

Tennessee Tech policy requires that students be in full standing to receive a graduate assistantship. Indeed, most EVS students are admitted with full standing; however, applicants who do not fully meet the above requirements may be admitted with provisional standing on the basis of a favorable recommendation to the College of Graduate Studies by the appropriate

departmental chairperson and the EVS director. If an admitted student did not fully meet the above requirements, they can be admitted with one of the following classifications: provisional standing (indicating that the student did not qualify for full standing and that specific deficiencies must be removed before the completion of 15 graduate hours) or special standing (students who declare a non-degree graduate objective or transient students who have been admitted to graduate schools of other institutions). In these rare cases, reclassification to full standing in the EVS program is usually accomplished within one or two semesters.

Assistantship awards include an annual stipend of $24,000 plus full waiver of tuition and fees. The stipend was recently raised from $21,000 to $24,000 (effective January 2, 2024) based on a summer 2023 benchmarking comparison of our stipend against other environmental doctoral programs in the U.S. The EVS committee has also been advocating for health insurance benefits for EVS students for more than five years. Currently no provision for health insurance is included for graduate students at Tennessee Tech, despite initiatives from the School of Environmental Studies and the College of Graduate Studies to develop such a system in recent years. In Fall 2022, TTU President Phil Oldham established an ad-hoc committee to study the feasibility and cost of providing a health-insurance benefit to all master's and doctoral level graduate students on assistantship. Faculty and student representatives from SOES were members of the ad-hoc committee. The committee produced its final report and recommendations in Spring 2023, but to our knowledge no final decision has been announced from the higher administration. The lack of graduate student health insurance is one of the primary ongoing concerns for graduate students and faculty across campus.

There are three types of assistantship awards: research assistantship (GRA), teaching assistantship (GTA), and academic support assistantship (GSA). In any typical year, approximately 40% of EVS students are on GRA appointments, 35% on GTA appointments, 5% on GSA appointments, and the remaining 20% are not on assistantships because they work full-time, either at Tennessee Tech or elsewhere, and thus receive tuition benefits through their employer. GRA students may receive a higher stipend than the $24,000 threshold if their advisor and the principal investigator on the grant approve the higher rate. GTA students are supervised within their home concentrations and typically teach three laboratory sections per semester, although they sometimes teach an undergraduate lecture course if they have a master's degree or 18 graduate credit hours in the teaching discipline. All graduate assistants work 20 hours per week and their work performance is evaluated at the end of each semester, with records maintained in the SOES department.

Incoming EVS students are invited to participate in the College of Graduate Studies orientations scheduled at the beginning of the spring and fall semesters. EVS students also are required complete a wide array of training modules related to their research, teaching, and academic support functions. These trainings are coordinated by SOES administrative associate Irene Mauk. GSAs complete additional training due to their duties which may include advising undergraduate students.

After securing a $3,000,000 NSF Research Traineeship 5-year grant in 2022, the faculty developed several new courses to experientially embed graduate students in community-based

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research projects, including CHE 6130 FEW Nexus Challenge, CHE 6150 Interdisciplinary Integration and Techniques, CHE 6950 Directed Studies–Immersion Experience, CHE 6960 FEW-Nexus Capstone, and SOC/HIST 6100 Interdisciplinary Cultural Training. The overall project focuses on graduate student research engagement with indigenous, rural, and Appalachian communities, under the title of "Engendering the Spirit of Gadugi at the Food-Energy-Water Nexus" (https://www.tntech.edu/graduatestudies/nrt-nsffellowship.php), inspired by the Cherokee philosophy of working together in community. Two current EVS doctoral students are supported by these NSF-NRT fellowships, and additional FEW Nexus student cohorts will be developed in each of the four upcoming years. The fellowships include an annual stipend of $34,000 and full coverage of tuition/fees, which is $10,000 higher than our standard graduate assistantship stipend for the EVs program, but the NSF-NRT fellows have additional coursework and other responsibilities that warrant the higher amount. This is an exciting opportunity for EVS students to broaden their coursework and intercultural training to become even more well-rounded professionals. Graduate students who are not in the NRT program can also take the new courses.

Milestones for Student Progress

Once admitted to the program, EVS students are encouraged to progressively attain a series of milestones along their pathway to graduation. The EVS graduate review committee examines student progress on an annual basis, and the EVS director reviews student annual reports that are due in January of each year.

The milestones are arranged chronologically as follows:

- Selection of graduate advisory committee chair and members (end of first year)
- Committee approval of coursework/program of study (end of first year)
- Completion of transfer credits (first or second year)
- Completion and approval of research plan (second year)
- Completion of core courses and 80% of total coursework (third year)
- Written/oral comprehensive exams; admission to candidacy (third year)
- Submission of one chapter for peer review before defense (fourth year)
- Dissertation defense and seminar (end of fourth year)
- Exit questionnaire, exit interview, and graduation (end of fourth year)

Student Annual Report

Each year in January, EVS students will produce an annual report of their scholarly and professional activities that cover the preceding 12-month calendar year. An example template for the annual report is shown on the following page.

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Guidelines for Completing EVS Ph.D. Student Annual Reports Example from 2024

Step 1: Please review the EVS Ph.D. Program learning outcomes below.

> Student Learning Outcome 2.1: Students will improve oral and written communication skills by giving technical presentations at symposia, conferences, and similar venues where abstracts are peer-reviewed for acceptance.
>
> Student Learning Outcome 2.2: Students will improve written communications skills by submitting manuscripts to peer-reviewed publications such as scholarly journals, conference proceedings, books, or similar outlets.

Step 2: Each student will create a Word document that summarizes her/his activities for the past calendar year (January 1, 2024 to December 31, 2024) that are related to the learning outcomes. Use the headings below and the formatting shown in the examples on the following pages. For presentations, please underline the name of the presenter(s).

1. Student Name; EVS Concentration; Advisor
2. Challenges to Future Progress and Completion of Degree
3. Technical Presentations (Oral)
4. Technical Presentations (Poster)
5. Manuscripts Submitted
6. Manuscripts Accepted
7. Manuscripts Published
8. Related Activities
    a. Grant Proposals Submitted
    b. Grant Proposals Awarded
    c. Non-technical Presentations
    d. Awards and Honors
    e. Scientific Conferences Attended
    f. Other Related Activities

Step 3: Submit the Word document electronically to Ms. Irene Mauk (imauk@tntech.edu) by January 31, 2025. Thank you for playing a vital role in the success of our EVS Ph.D. program.

EVS Student Annual Report for January 2024 - December 2024 - template

(Contrived example for fictional student "Martina McReynolds" to show formatting)

1. Martina R. McReynolds; Biology Concentration; Advisor: Dr. Hayden Mattingly

2. Challenges to Future Progress and Completion of Degree

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- My assistantship expires in May 2025. My advisor and I do not have funding to cover my stipend, tuition and fees for summer 2025 to facilitate my planned graduation in December 2025.

3. Technical Presentations (Oral) (Presenters underlined)

- McReynolds, M.R., and H.T. Mattingly. Species-habitat associations of a rare Tennessee stream fish at four spatial scales. Southeastern Fishes Council Annual Meeting, Lake Guntersville State Park, Alabama. August 2013.
- McReynolds, M.R., H.T. Mattingly, and M.D. Padgett. Comparison of rarity patterns in two crayfishes on the Cumberland Plateau. American Society for Freshwater Science Annual Meeting, Seattle, Washington. December 2013.

4. Technical Presentations (Poster) (Presenters underlined)

- McReynolds, M.R., H.T. Mattingly, and D.I. Withers. A new drainage basin distributional record for Brawley's Fork Crayfish, *Cambarus williami*, in Tennessee. 8th Annual Student Research Day, Tennessee Technological University, Cookeville, Tennessee.
  April 2013.

5. Manuscripts Submitted

- McReynolds, M.R., H.T. Mattingly, and M.D. Padgett. Population densities of two rare crayfishes, *Cambarus obeyensis* and *Cambarus pristinus*, on the Cumberland Plateau of Tennessee. Submitted January 2013 to *Southeastern Naturalist*.
- Black, T.R., McReynolds, M.R., H.T. Mattingly, and D.D. Smith. Habitat use of stream-dwelling crayfish during reproductive seclusion. Submitted July 2013 to *Freshwater Biology*.
- McReynolds, M.R., H.T. Mattingly, and R.J. DiStefano. Habitat use of two crayfishes, *Orconectes meeki meeki* and *Orconectes williamsi*, in a small Missouri Ozark stream. Submitted December 2013 to *Freshwater Crayfish*.

6. Manuscripts Accepted (accepted or in press)

- McReynolds, M.R., H.T. Mattingly, and M.D. Padgett. Population densities of two rare crayfishes, *Cambarus obeyensis* and *Cambarus pristinus*, on the Cumberland Plateau of Tennessee. IN PRESS at *Southeastern Naturalist*.
- Black, T.R., McReynolds, M.R., J.W., H.T. Mattingly, and D.D. Smith. Habitat use of stream-dwelling crayfish during reproductive seclusion. ACCEPTED with minor revisions by *Freshwater Biology*.

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7. Manuscripts Published (with volume and page numbers, or with DOI link)

- DiStefano, R.J., T.R. Black, M.R. McReynolds, S.S. Herleth-King, Y. Kanno, and H.T. Mattingly. 2013. Life histories of two populations of the imperiled crayfish *Orconectes* (*Procericambarus*) *williamsi* (Decapoda: Cambaridae) in southwestern Missouri. *Journal of Crustacean Biology* 33: 15-24.

8. Related Activities

   a. Grant Proposals Submitted (PI = Principal Investigator)

- Mattingly, H.T. (PI) and M.R. McReynolds (co-PI). Life history of the Obey Crayfish, *Cambarus obeyensis*: Implications for species conservation. Submitted April 2013 to Tennessee Wildlife Resources Agency. Amount Requested: $45,000.

   b. Grant Proposals Awarded

- Mattingly, H.T. (PI) and M.R. McReynolds (co-PI). Life history of the Obey Crayfish, *Cambarus obeyensis*: Implications for species conservation. Awarded November 2013 by Tennessee Wildlife Resources Agency. Total Award = $45,000 ($15,000 in 2013-2014; $15,000 in 2014-2015; and $15,000 in 2015-2016).

   c. Non-technical Presentations (Presenters underlined)

- McReynolds, M.R. The importance of rain gardens in residential developments to protect local water quality. Cookeville Garden Club, Cookeville, Tennessee. March 2013.
- McReynolds, M.R. and M.D. Padgett. Crayfish and mussels: Our freshwater friends. Sycamore Elementary School, Cookeville, Tennessee. May 2013.

   d. Awards and Honors

- Best Student Presentation Award: McReynolds, M.R., and H.T. Mattingly. Species-habitat associations of a rare Tennessee stream fish at four spatial scales. Southeastern Fishes Council Annual Meeting, Lake Guntersville State Park, Alabama. November 2013.

   e. Scientific Conferences Attended

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- State/Local: 8th Annual Student Research Day, Tennessee Technological University, Cookeville, Tennessee. April 2013.
- Regional: Southeastern Fishes Council Annual Meeting, Lake Guntersville State Park, Alabama. August 2013.
- National/International: American Society for Freshwater Science Annual Meeting, Seattle, Washington. December 2013.

f. Other Related Activities

- Co-developed website with J.T. Hightower on the importance of rain gardens to urban and suburban water quality: URL: www.raingardens.org

EVS Committee Structure and Shared Governance

The structure of the EVS program is strengthened and maintained by three committees: EVS executive committee, EVS curriculum committee, and EVS graduate student review committee. The executive committee is chaired by the EVS director who schedules meetings at least once each semester and more frequently as needed. The executive committee has faculty representatives from all five concentrations, two student representatives, along with ex officio administrative members, and this committee serves as the primary governing body for the program. In addition to the executive committee, curriculum and graduate student review committees were created in 2012-2013 with specific charges to (a) address curricular matters and make recommendations for changes to the executive committee and (b) review newly admitted and continuing students with the goal of creating a prioritized list of assistantship-award recommendations for the EVS director to act upon. The curriculum committee has faculty and student representatives and meets on an as-needed basis, typically once or twice per academic year. The graduate review committee has only faculty representatives and meets once per year, usually in March, to make assistantship recommendations for the upcoming academic year.

Membership on the EVS committees for the 2024-2025 academic year is as follows:

<u>EVS Executive Committee</u>

- Steve Sharp (Chairperson)
- Wilson Gichuhi (EVS Coordinator)
- Abdul Momin (Agriculture)
- Mustafa Rahnama (Biology)
- Hong Zhang (Chemistry)
- Evan Hart (Geosciences)
- Robby Sanders (Integrated Research)
- Lauren Harding (Sociology and Political Science)
- Tom Miles (EVS-Biology student)
- Cadnence Miller (EVS-Chemistry student)

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- Julie Baker (ex officio)
- Hayden Mattingly (ex officio)
- Michael Nattrass (ex officio)
- Steve Hayslette (ex officio)
- Chad Rezsnyak (ex officio)
- Peter Lee (ex officio)

EVS Curriculum Committee

- Hayden Mattingly (Chairperson)
- Ciana Bowhay (Agriculture)
- Chris Brown (Biology)
- Andrew Callender (Chemistry)
- Joseph Asante (Geosciences)
- Sabrina Buer (Integrated Research)
- Lauren Harding (Sociology and Political Science)
- Ronnie Dunn (EVS-Agriculture student)
- Namal Abeysooriya (EVS-Chemistry student)

EVS Graduate Review Committee

- Steve Hayslette (Chairperson)
- Abdul Momin (Agriculture)
- Brad Cook (Biology)
- Ranil Gurusinghe (Chemistry)
- Evan Hart (Geosciences)
- Bahman Ghorashi (Integrated Research)

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Graduate Advisory Committee Guidelines

Students will form their Graduate Advisory Committee during the first year in the program. The EVS Executive Committee recently revised the guidelines for committee membership, as follows:

> **Guidelines for Graduate Committee Composition**
>
> The organization and appointment of advisory committees to supervise graduate study for the degree of Doctor of Philosophy in Environmental Sciences shall be the same, generally, as in the master's program, except that the advisory committee shall consist of at least five (5) members of the Graduate Faculty, plus the Director of Environmental Sciences Ph.D. program who serves as an ex officio, nonvoting member. For students concentrating in Agriculture, Biology, Chemistry, and Geosciences, three (3) members of the advisory committee shall be from the student's area of concentration, at least one (1) member shall be from a separate department of the environmental science core outside the student's area of concentration, and one (1) member may be from any department within the university. For the Integrated Research concentration, at least two (2) members shall be from departments participating in the environmental science core, one (1) member shall be from any STEM department, and two (2) members may be from any department within the university. For all concentrations, no more than three (3) committee members may be from the same department. Changes in a Ph.D. advisory committee must adhere to all policies and procedures governing graduate study at the University, as contained in the Graduate Catalog and administered by the Dean of Graduate Studies.

Committee members from outside the university can be proposed for membership on student advisory committees. The student and their advisor can contact the EVS program director to request that the external person be added to the TTU Graduate Faculty as an adjunct consultant. The EVS director will initiate a DocuSign form to make the formal request to the College of Graduate Studies. The director will need (1) the external person's current title and rank and (2) a pdf version of the external person's CV. No more than one adjunct consultant can serve as a voting member of any graduate advisory committee. However, a sixth person can be added as a non-voting adjunct consultant if desired.

Curriculum, Course Offerings, and Credit Transfer

The EVS program requires completion of 61 credit hours of graduate-level coursework in a program of study approved by the student's graduate advisory committee and the EVS director. The general outline of credit hour requirements can be summarized as follows:

- 18 hours transferred from master's degree or taken as electives
- 18 hours of Research and Dissertation
- 12 hours of EVS 6010 core courses

- 12 hours of 7000-level electives
- 1 hour of EVS 7910 seminar

The primary curricular differences among the five EVS concentrations involve core courses, elective courses, and seminar. For core courses, students in EVS-Agriculture, EVS-Biology, EVS-Chemistry, and EVS-Geosciences typically would complete four of the five core courses, omitting the course in their home concentration. For example, an EVS-Biology student would normally omit EVSB 6010 Environmental Biology while taking the following four courses: EVSA 6010 Environmental Agriculture (3 credit hours); EVSC 6010 Environmental Chemistry (3 credit hours); EVSG 6010 Environmental Geology (3 credit hours); and EVSS 6010 Environmental Social Policy (3 credit hours). EVS-Integrated Research students can select any four of the five courses, depending on their prior academic experience and dissertation research goals. The core courses are primarily lecture- and discussion-based and do not have stand-alone laboratory sections; however, in some courses the instructors involve the students in field and laboratory projects or community service projects.

For transfer credits, the student and their committee can propose up to 18 credit hours of previous graduate-level coursework to be applied to the student's EVS PhD program of study. The process involves filling out a DocuSign form titled "Transfer of Graduate Credits Application" (see link immediately below) that lists the proposed transfer credits and their reasonable equivalent courses at Tennessee Tech. The form routes through the committee members and then to the EVS program director, Emerging and Integrative Studies dean, and Graduate Studies for approvals.

https://na3.docusign.net/Member/PowerFormSigning.aspx?PowerFormId=92bfdd33-9b58-4531-b749-694243f49c91&env=na3&acct=452bda42-ec53-4563-933f-7542a0d9fcfa&v=2

For 7000-level electives, students can choose 12 credit hours from (a) EVS courses that are not concentration-specific, such as EVS 7800 Professional Development for Doctoral Students or EVS 7900 Scientific Writing and Grantsmanship; (b) courses offered by faculty with a perspective from within their concentration, such as EVSA 7030 One Health: Principles and Applications, EVSB 7120 Endangered Species Biology, or EVSC 7210 Organic Chemistry in the Environment; or, less commonly (c) 7000-level courses from other doctoral programs, such as EDPY 7310 Advanced Educational Statistics. Students tend to choose several courses from their home concentration, although graduate advisory committees generally allow some leeway for selection of one or more courses outside of concentration if it helps meet a need for the student. The number of 7000-level topics courses (e.g., EVSI 7970) are generally governed by the concentrations and the graduate advisory committees; some concentrations allow more topics credit than others.

For EVS 7910 Environmental Science Seminar, the concentrations have freedom to approach the seminar in a fashion best-suited for their disciplines. For example, EVS-Biology students typically take EVS 7910 near the end of their degree program and use the seminar course to present their dissertation seminar. On the other hand, EVS-Chemistry students take EVS 7910 early in their degree program and use the opportunity to present a literature review

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seminar. EVS-Chemistry students also present a dissertation seminar as they approach graduation, but the dissertation seminar is not associated with a seminar course grade.

For advising and planning purposes, course projections for upcoming semesters are maintained by SOES staff and are located on the department's website. An example for Spring 2024 through Spring 2027 is shown here:

AGRIBUSINESS ECONOMICS	AGBE									
Course Description	*Course #*	*Spring 24*	*Fall 24*	*Spring 25*	*Fall 25*	*Spring 26*	*Fall 26*	*Spring 27*	*Notes*	*Credits*
Environmental and Natural Resourse Economics	4120/5120		X		X		X		Prereq: AGBE 2100 or ECON 2010	3

CHEMICAL ENGINEERING	CHE									
Course Description	*Course #*	*Spring 24*	*Fall 24*	*Spring 25*	*Fall 25*	*Spring 26*	*Fall 26*	*Spring 27*	*Notes*	*Credits*
FEW Nexus Challenge	6130	X		X		X		X		3
Interdisciplinary Integration and Techniques	6150		X		X		X		Will be available F24 or F25	3
Directed Studies-Immersion Experience	6950								Will be available F24, S25 or F25	3
FEW-Nexus Capstone	6960								Will be available F24, S25 or F25	3

ECONOMICS	ECON									
Course Description	*Course #*	*Spring 24*	*Fall 24*	*Spring 25*	*Fall 25*	*Spring 26*	*Fall 26*	*Spring 27*	*Notes*	*Credits*
Natural Resource Economics	4120/5120		X		X		X		AGBE 2100 or ECON 2110	3
Environmental Economics	4200/5200	X						X	Prereq: AGBE 2100 or ECON 2010	3

ENVIRONMENTAL STUDIES	ESS									
Course Description	*Course #*	*Spring 24*	*Fall 24*	*Spring 25*	*Fall 25*	*Spring 26*	*Fall 26*	*Spring 27*	*Notes*	*Credits*
Environmental Law	6000	X		X		X		X		3

ENVIRONMENTAL SCIENCES	EVS									
Course Description	*Course #*	*Spring 24*	*Fall 24*	*Spring 25*	*Fall 25*	*Spring 26*	*Fall 26*	*Spring 27*	*Notes*	*Credits*
Professional Development for Doctoral Students	7800		X		X		X			3
Scientific Writing and Grantsmanship	7900	X	X	X	X	X	X	X		3
Environmental Sciences Seminar	7910	X	X	X	X	X	X	X		1

ENVIRONMENTAL AGRICULTURE	EVSA									
Course Description	*Course #*	*Spring 24*	*Fall 24*	*Spring 25*	*Fall 25*	*Spring 26*	*Fall 26*	*Spring 27*	*Notes*	*Credits*
Environmental Agriculture	6010	X							As Ag. Dept. offers	3

ENVIRONMENTAL BIOLOGY	EVSB									
Course Description	*Course #*	*Spring 24*	*Fall 24*	*Spring 25*	*Fall 25*	*Spring 26*	*Fall 26*	*Spring 27*	*Notes*	*Credits*
Environmental Biology	6010	X	X							3
Endangered Species Biology	7120			X				X	Spring of even years as needed	3
Wildlife and Fisheries Nutrition	7140								Fall of even years as needed	3
Poplulation and Community Ecology	7150	X				X			Prereq: BIOL 3130 or WFS 3130, Offered as needed	3
Molecular Ecology and Evolution	7230								Offered as needed	3
Topics in Environmental Biology	7970	X	X	X	X	X	X	X	Offered as needed	1,2,3,4
Research and Dissertation	7990	X	X	X	X	X	X	X		3,6,9

ENVIRONMENTAL CHEMISTRY	EVSC									
Course Description	*Course #*	*Spring 24*	*Fall 24*	*Spring 25*	*Fall 25*	*Spring 26*	*Fall 26*	*Spring 27*	*Notes*	*Credits*
Environmental Chemistry	6010			X				X		3
Water, Soil, and Air Chem-Part I	7110		X				X		Prereq: CHEM 5520 or 5710	3
Water, Soil, and Air Chem-Part II	7120			X				X	Prereq: EVSC 7110	3
Organic Chem/Env	7210				X				Prereq: CHEM 3520 and 6210	3
Environmental Forensics	7310		X				X			3
Special Topics/Env Chem	7970	X	X	X	X	X	X	X	Offered as needed	3
Research & Dissertation	7990	X	X	X	X	X	X	X		1,3,6

ENVIRONMENTAL GEOLOGY	EVSG									
Course Description	*Course #*	*Spring 24*	*Fall 24*	*Spring 25*	*Fall 25*	*Spring 26*	*Fall 26*	*Spring 27*	*Notes*	*Credits*
Environmental Geology	6010		X							3

ENVIRONMENTAL SOCIOLOGY	EVSS									
Course Description	*Course #*	*Spring 24*	*Fall 24*	*Spring 25*	*Fall 25*	*Spring 26*	*Fall 26*	*Spring 27*	*Notes*	*Credits*
Environmental Social Policy	6010	X				X				3

HISTORY	HIST									
Course Description	*Course #*	*Spring 24*	*Fall 24*	*Spring 25*	*Fall 25*	*Spring 26*	*Fall 26*	*Spring 27*	*Notes*	*Credits*
Interdisciplinary Cultural Training	6100		X		X		X			3

SOCIOLOGY	SOC									
Course Description	*Course #*	*Spring 24*	*Fall 24*	*Spring 25*	*Fall 25*	*Spring 26*	*Fall 26*	*Spring 27*	*Notes*	*Credits*
Interdisciplinary Cultural Training	6100		X		X		X			3

WILDLIFE & FISHERIES SCIENCE	WFS									
Course Description	*Course #*	*Spring 24*	*Fall 24*	*Spring 25*	*Fall 25*	*Spring 26*	*Fall 26*	*Spring 27*	*Notes*	*Credits*
National Wildlife Policy	5500		X		X		X			3

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Student Research Plan (Proposal)

Students typically begin working on their Research Plan (commonly called "Proposal") during their first year of the PhD program. When the student and their advisor is ready to bring the Research Plan to their committee for review, they will schedule a meeting and give the committee members two weeks in advance to review the Research Plan. There is no program-level format or guidelines for producing the Research Plan, although some concentrations have formatting preferences that adhere to their respective disciplines. Common sections of the Research Plan include:

- Title Page with signature spaces for committee members
- Introduction and Literature Review
- Research Objectives
- Approach, Methods, Materials
- Timeline for completing objectives and writing
- Budget (if needed)
- Literature Cited or References
- Tables and Figures
- Appendices

Comprehensive Exams and Admission to Candidacy

Students often take their comprehensive exams during the third year of their program. General information regarding the exams can be found in the Graduate Catalog, as shown here for the EVS-Biology concentration:

Guidelines for the Comprehensive Examination

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

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

Descriptions

The test will consist of written and/or oral portions. The student's advisory portion will consist of four (4) sections. Total time for each section should not exceed eight (8) hours. Three (3) sections will contain material from the student's area of concentration and one (1) section will integrate material from the Environmental Sciences Core Curriculum. It is the graduate advisory committee chair's responsibility to ensure that all committee members will be involved in the administration and evaluation of the written and oral exams, per University Policy 282.

If an oral exam is to be included as part of the comprehensive exam it will be administered by the students advisory committee within three (3) weeks of the successful completion of the written portion of the exam. A question will be included in the oral exam that tests the students understanding of the interdisciplinary nature of Environmental Sciences.

If an oral exam is included as part of the comprehensive exam, both portions of the Comprehensive Examination will be completed during one (1) academic semester.

Results

Four-fifths of the voting members of the committee must agree that the student has successfully completed the comprehensive exam.

The student will be given one (1) additional opportunity to pass each portion of the Comprehensive Examination. Failure to pass either portion on the second try will result in the student's dismissal from the Ph.D. program.

A written evaluation of the student's performance on the Comprehensive Examination will be prepared by the students advisory committee and kept on file in the office of the Director of the Environmental Sciences Ph.D. program.

Time Constraints

Successful completion of the Comprehensive Examination must be achieved in a timely fashion. The complete Comprehensive Examination must be scheduled and taken within a year following the completion of 80% of the course work in the students Program of Study, including successful completion of all core courses. It shall be the student's responsibility, in consultation with his/her advisor, to schedule this examination at a date agreeable to the whole examining committee. The committee shall be given at least two (2) months advance notice of the Examination date in order to make preparations. Any second attempts to pass portions of the Comprehensive Examination must be scheduled in the subsequent (Fall/Spring) semester. Failure to follow these procedures shall result in the student's dismissal from the program. Any appeal by the student for exceptions to this policy shall be made in writing and submitted to the Executive Committee of the Ph.D. program.

The five EVS concentrations have some variation in how the comprehensive exams are administered. For example, EVS-Chemistry students take the oral portion of the exam in conjunction with the EVS 7910 Seminar course early in their program of study, and then later

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they take the written portion in their third year. The other concentrations have the written portion in the third year and it may or may not be immediately followed by an oral exam. The decision regarding an oral exam is left to the graduate advisory committee, or in some cases, all students in a given concentration follow a concentration-specific decision whether to have an oral exam or not. An oral exam is encouraged (but not required) because it allows the faculty and the student an opportunity to follow up on the written exams in a more formal fashion.

In all concentrations, the chairperson of the student's graduate advisory committee ensures that all committee members are involved in the comprehensive exams, by submitting and grading written questions, asking questions during the oral exam, and making a voting decision whether the student has passed the written and oral portions. Here are the common steps that the chairperson takes to conduct the exams:

1. Communicate with the student to identify the preferred semester (Fall, Spring, or Summer) to complete the comprehensive exams.
2. Ask the student to meet individually with each committee member to receive any guidance or suggestions regarding how to prepare for the exams.
3. Encourage the student to set aside sufficient study time while preparing for the exams (some faculty recommend several months of advance preparation).
4. Communicate with the student's committee members to establish dates for the written exams. It is common to leave two or three days in between written exams to give the student time to rest or study in between exams, but still allowing the four writing days to occur within a two-week time period.
5. Identify a committee member to coordinate the EVS Core portion of the exam. The coordinating member is often a faculty member in an EVS Core area outside of the student's concentration. The chairperson sometimes serves as the coordinating member if no other suitable person is available. Ask the student which instructors they had for the various EVS 6010 courses. The coordinating member will solicit exam questions from each of the four core instructors. The questions from each core instructor should be completable in a two-hour timeframe such that the Core Exam day does not exceed 8 hours total. The coordinating member then bundles the four sets of questions into a single exam document for the Core Exam day.
6. Determine in advance if an oral exam will be required. Set a tentative oral exam date to fall within 30 days of the last written exam, in the same semester as the written exams, such that the oral exam will be scheduled if the student passes the written portions of the exams.
7. It is common for the chairperson to ask Irene Mauk, Administrate Associate in the School of Environmental Studies (imauk@tntech.edu), to set up a Teams site for the committee members to facilitate exam preparation, review, grading, and so forth. The student should not have access to this Teams site. The chairperson can establish the Teams site if that is preferred.
8. All committee members should be involved in the comprehensive exams. Sometimes committees decide to combine written questions from more than one committee member for the three non-Core writing days.
9. Test conditions for the written exams should be clearly indicated at the top of the exam. They may be open or closed books, notes, Internet, etc., depending on the committee member's discretion, but the conditions should be clearly stated.

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10. It is common for the EVS Core exam to be proctored by the EVS program director or the EVS admissions coordinator, but this is not a program-level requirement and the decision is left to the graduate advisory committee. The other exams can be taken in the student's office, or any other location that is agreeable to the committee and the student.
11. For the EVS Core, the coordinating member receives the student's answers and distributes them back out to the core instructors for grading. For the three non-Core days, the committee members grade the exams. In all cases it should be clearly indicated whether or not the student passed or did not pass the written exam in question. Some faculty also include a numerical grade or a letter grade, but the only requirement is a written indication of "Pass" or "Did not pass". The faculty load the graded exams to the Teams site for all committee members to review.
12. After all written exams are completed, the chairperson will schedule a date for the committee members to meet (without the student present) to discuss the student's performance on the written portion of the exam. If an oral exam is to be included, the committee will decide in this meeting if the student can progress on to the oral exam.
13. After the oral exam, the committee will vote to decide whether the student has passed the comprehensive exams. At least four out of five voting members must agree that the student has successfully passed the exam. If the student passes, and if the student has already submitted an approved Research Plan, then the student can progress on to candidacy by the committee completing the "PhD Admission to Candidacy & Comprehensive Exam Form" linked below. If the student has not submitted an approved Research Plan, then the committee should wait to sign off on the candidacy form until the Research Plan is completed and approved.

    https://www.tntech.edu/graduatestudies/pdf/phd/2023phdadmissiontocandancyform.pdf

14. When a committee agrees to pass the student on the comprehensive exams, in some cases they ask the student to do an extra assignment to ensure satisfactory knowledge about a certain aspect of Environmental Sciences relevant to their specific concentration. In other words, student comprehensive exam performance can sometimes be generally strong, but just one or two areas might show a weakness or opportunity for necessary professional growth and development. For example, as a required follow-up to the comprehensive exams, a student might be asked to take or audit a certain course, or give a guest lecture on a certain topic, or work with a committee member on a research study to encourage deeper understanding of a given topic. It is not uncommon for students to pass the comprehensive exams, yet have some additional assignment to help them fully develop their knowledge and skills at the doctoral level.

Dissertation Guidelines and Defense

Students in the EVS degree program are required to submit one dissertation chapter for external peer review prior to scheduling the dissertation defense. It is recommended and common practice for the committee to have a chance to review this chapter before it goes out for peer review; however, advance committee review is not a program-level requirement.

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Committee members should have at least two weeks to review the dissertation before the defense date. At the defense, the focus is on the dissertation document itself; the defense is not commonly used for comprehensive-exam style questioning on a wider range of topics. The committee should be prepared to sign the "College of Education, Engineering, and Emerging and Integrative Studies Defense Form" which is available in either pdf or DocuSign formats. Similar to the comprehensive exams, approval (pass) from at least four of the five voting members of the committee are needed for the student to successfully pass the defense.

Dissertation Format

The College of Graduate Studies currently uses APA-style formatting guidelines for the dissertation. However, the EVS program recently submitted a proposal to Graduate Studies to allow manuscript-style formatting for EVS dissertations (although students still may elect to use the APA style). The proposal was approved by Graduate Studies, and the new guidelines are summarized below:

College of Graduate Studies Manuscript Formatting Guidelines Thesis/Dissertations

Several programs at Tennessee Tech including Environmental Sciences, Biology, and Chemical Engineering conduct research best presented as discrete journal articles rather than a continuous document. Manuscript chapters better showcase individual projects and streamline publication, aligning with the program requirement for students to submit a manuscript for publication before graduation. The manuscript format also enables a more comprehensive dissertation and thesis because findings need not be abridged to fit a unified narrative. Recognizing the benefits of flexibility, the College of Graduate Studies has adopted manuscript-style formatting on a program basis. Your program must be approved to use this formatting option.

General formatting will adhere to existing standards as listed in the Thesis/Dissertation Handbook and website (Thesis/Dissertation Formatting (tntech.edu), including margin size, line spacing, heading style consistency, and continuous pagination. Specific manuscript format requirements are:

1. Chapters will comprise discrete manuscripts with the student as sole or first author ready for submission.
2. A thesis/dissertation with manuscript chapters must be thematically cohesive and must also include: (a) a Preface overviewing format structure, (b) An Introductory chapter that may include a literature review that defines the objectives of the research, as agreed upon by the committee, and (c) A concluding chapter that ties together the major results. Unavoidably, this will duplicate some of the introductory and concluding material in each article/chapter.
3. A single, standard peer-reviewed publication format will be used consistently across

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all chapters.

4. Examples of acceptable peer-reviewed formatting styles include, but are not limited to, the following: American Chemical Society journals, Journal of Wildlife Management, North American Journal of Fisheries Management, Cell, or Agriculture & Environmental Letters.
5. Individual reference sections will directly follow each chapter.

This format option upholds disciplinary writing rigor while better accommodating diverse research approaches. The College of Graduate Studies believes allowing this enhanced organizational structure is in the best interest of student scholarship and strongly recommend its adoption.

Professional Development Opportunities

The School of Environmental Studies earmarks funding in its annual budget for professional development opportunities for EVS PhD students. Requests for student support must be submitted by the student's advisor to the EVS program director through a fillable pdf form (available by emailing Irene Mauk; imauk@tntech.edu). Most requests are for student travel to present their research at conferences. The amount of funding available for each student ranges from $500 to $1,000, depending on budgetary allocations which can vary from year to year. EVS students also have local opportunities to present their research at (1) Tennessee Tech's Research Day and (2) the Department of Biology and School of Environmental Studies Student Research Colloquium. Both events are held in the Spring Semester of each academic year.

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