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Environmental Resource Science, M.S.



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The Master of Science degree program in Environmental Resource Science prepares highly-trained environmental scientists to address challenges related to the critical environmental resources of water and soil. In this program, students learn about the interactions between water and soil resources within a biophysical system. The program focuses on the principles and practices of investigating and characterizing water and soil resources as well as those employed for their successful management and remediation. Considerable emphasis is dedicated to preparing students to identify and use state-of-the-art environmental methods and technologies in these areas.

Admission and Prerequisites

In addition to the general admission requirements of the Graduate School, admission to the M.S. program in Environmental Resource Science requires:

- a Bachelor's degree in a related scientific or engineering field
- completion of nine credit hours of general science requirements (or their equivalents)

Substitutions for these general science requirements may be considered on a case-by-case basis by the program; approval of substitutions must be conveyed by the Graduate Coordinator to the Dean of the Graduate School at the time of application review by the department.

Degree Requirements

To earn the M.S. degree in Environmental Resource Science, students must complete the 35-hour curriculum, with thesis and non-thesis tracks, as outlined below. Courses are organized into the categories of:

Water Resources

- ENVS 445G - Coastal Sciences **3 Credit(s).**
- ENVS 484 - Watershed Science **3 Credit(s).**
- ENVS 486G - Water Quality **4 Credit(s).**
- GEOL 431G - Introduction to Geochemistry **3 Credit(s).**
- GEOL 440G - Oceanography **3 Credit(s).**
- GEOL 470G - Ground Water **3 Credit(s).**
- GEOL 509 - Advanced Ground Water Hydrology **3 Credit(s).**
- GEOL 510 - Advanced Environmental Geology **3 Credit(s).**
- GEOL 532 - Petroleum Geochemistry **3 Credit(s).**
- BIOL 407G - Environmental Toxicology **4 Credit(s).**
- BIOL 441G - Limnology and Oceanography **4 Credit(s).**
- CIVE 606 - Advanced Hydrology **3 Credit(s).**
- CIVE 646 - Probabilistic Methods in Hydrosience **3 Credit(s).**
- CIVE 661 - Physicochemical Treatment Processes **3 Credit(s).**

Soil Resources

- ENVS 490G - Environmental Pedology **3 Credit(s).**
- ENVS 493G - Soil-Plant Relationships **3 Credit(s).**
- ENVS 495G - Soil Genesis and Survey **3 Credit(s).**
- ENVS 498G - Soil Biology **3 Credit(s).**

- ENVS 580 – Fate of Pollutants in Soils and Natural Waters **3 Credit(s)**.
- GEOL 433G – Clay Mineralogy **3 Credit(s)**.
- CIVE 663 – Solid and Hazardous Waste Management **3 Credit(s)**.

Environmental Methods

- ENVS 455G – Geographic Information Science I **3 Credit(s)**.
- ENVS 464G – Geographic Information Science II **3 Credit(s)**.
- ENVS 473G – Remote Sensing in GIS **3 Credit(s)**.
- ENVS 487G – Advanced GIS Analysis and Applications **3 Credit(s)**.
- GEOL 460G – Site Assessment and Remediation **3 Credit(s)**.
- GEOL 420G – Geophysics I **4 Credit(s)**.
- GEOL 432G – Instrumental Examination of Earth Materials **3 Credit(s)**.
- BIOL 504 – Advanced Microscopy **1–3 Credit(s)**.
- BIOL 427G – Experimental Design and Analysis **4 Credit(s)**.
- BIOL 502 – Quantitative Ecology **3 Credit(s)**.
- BIOL 503 – Ecological Models and Data **3 Credit(s)**.
- BIOL 575 – Statistical Ecology **4 Credit(s)**.
- BIOL 590 – Analytical Techniques **3–6 Credit(s)**.
- CIVE 567 – Experimental Analysis for Environmental Engineers **3 Credit(s)**.
- CHEM 430G – Instrumental Analysis **5 Credit(s)**.

Biophysical Relationships

- BIOL 412G – Conservation Biology and Biodiversity **3 Credit(s)**.
- BIOL 414G – Ornithology **4 Credit(s)**.
- BIOL 415G – Biogeography **3 Credit(s)**.
- BIOL 445G – Ichthyology **4 Credit(s)**.
- BIOL 461G – Aquatic and Wetland Vascular Plants **4 Credit(s)**.
- BIOL 542 – Evolutionary Ecology **3 Credit(s)**.
- BIOL 580 – Marine Ecology **3 Credit(s)**.

Note

With approval from the Graduate Coordinator, additional courses, offered at the 500-level or higher only, with appropriate content in any of the four course categories in the table above may be used to satisfy elective course requirements.

Thesis Track

The thesis track requires completion of the following 35 hours of graduate coursework:

- Water Resources Required Courses (6 graduate credit hours):
GEOL 470G Ground Water
- Soil Resources Required Courses (6 graduate credit hours):
ENVS 490G Environmental Pedology
ENVS 580 Fate of Pollutants in Soils and Natural Waters
- Environmental Methods Required Courses (3 graduate credit hours):
To be selected from the Environmental Methods courses identified in the table above.
- Seminar Required Course (2 graduate credit hours):
- Elective Courses (12 graduate credit hours required):
To be selected from the courses in the table above with no more than 9 graduate credit hours from courses identified as Biophysical Relationship courses.
- Thesis (6 graduate credit hours required):

Non-Thesis Track

The non-thesis track requires completion of the following 35 hours of graduate coursework:

- Water Resources Required Courses (6 graduate credit hours):
GEOL 470G Ground Water

- Soil Resources Required Courses (6 graduate credit hours):
ENVS 490G Environmental Pedology
ENVS 580 Fate of Pollutants in Soils and Natural Waters
- Environmental Methods Required Courses (3 graduate credit hours):
To be selected from the courses in the table above with no more than 9 graduate credit hours from courses identified as Biophysical Relationship courses.
- Seminar Required Course (2 graduate credit hours required):
- Non-thesis students must also complete one of the following to demonstrate a general, comprehensive knowledge of the field of study:
 1. Additional Elective (3 graduate credit hours)
The capstone project requirement shall be assigned by a faculty advisor and approved by a Capstone Committee comprised of graduate faculty members of the Environmental Science Program. The outcome of the project shall include a written report, which must be approved by the student's faculty advisor and the Capstone Committee. The faculty advisor and Capstone Committee shall assess satisfactory completion of this comprehensive requirement.
 2. The internship requirement includes the equivalent of one semester of part-time work with an industry partner. Prior to initiation of the internship, the student is required to develop a work plan with the company/agency and his/her graduate faculty advisor outlining the expected requirements or products of the internship. At a minimum, the student shall complete a final written report and deliver a presentation of his or her work. Details regarding the length and format of the report and presentation will be developed by the student's faculty advisor and an Internship Committee comprised of graduate faculty members of the Environmental Science Program in consultation with the industry partner.

Comprehensive Examination

Each candidate for a Master's degree is required to demonstrate a general, comprehensive knowledge of his or her field of study. Towards this, students in the Environmental Resource Science Master's program are required to achieve a grade of A or B on a minimum of three, 500-level courses. Each of these classes must be taken for 3 or more credits (i.e., 1 and 2 credit classes do not count towards this requirement).

Procedures

Following admission to the M.S. program in Environmental Resource Science, students will register for courses upon the advice of the Graduate Coordinator. Throughout the entirety of a student's study, the Graduate Coordinator shall provide comprehensive, long-range planning and advising for each semester's registration. After the completion of 12 hours of graduate coursework, the student must declare (via the Graduate School Application for Candidacy) their intention to pursue the thesis or non-thesis track. In consultation with the Graduate Coordinator, students pursuing a thesis track may select the chair of their thesis committee and begin working toward this goal at any time; official identification of the committee chair and committee members shall be done at the time of application for candidacy, however.

For the thesis track, students must develop a written thesis proposal that will be orally defended to the Thesis Committee. The committee must approve (unanimously) the written document and oral defense at least one semester prior to the student's thesis defense. The final written thesis must also be defended orally and approved by the Thesis Committee.

For the non-thesis track, students must receive approval by the Graduate Coordinator for plans for the capstone project/additional elective capstone project or the internship. Approval should occur as soon as possible after the student declares his or her intent to follow the non-thesis track (via the Graduate School Application for Candidacy).

The maximum course load for a graduate student in Environmental Resource Science shall be twelve graduate credit hours during a regular semester and nine graduate credit hours during a summer session. It is expected that full-time students will complete all requirements for the M.S. degree within two years.

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