HYDROLOGY (M.S.)

https://ceps.unh.edu/earth-sciences/program/ms/hydrology

Description

This program is intended for students interests in fluvial processes, global-scale hydrology, groundwater hydrology, hydroclimatology, water quality, quantitative and statistical hydrology, and water resource management.

Admission Requirements

An applicant to the M.S. program is expected to have demonstrated competency in the following college courses: one year each of calculus and chemistry and two semesters of physics and/or biology. In addition, the applicant is expected to have an undergraduate degree or equivalent in geology, chemistry, physics, mathematics, computer science, engineering, or the biological sciences. Students lacking some background in a particular area may be admitted provided they are prepared to complete courses, without graduate credit, in which they may be deficient. The program of study a student wishes to follow and the student's undergraduate major determine the level of preparation necessary. The preparation of each student is determined before the beginning of the first semester in residence in order to plan the course of study. Each entering student is assigned an academic adviser to assist in planning a program of study.admitted,

Requirements

Degree Requirements
Thesis Option

Students in the thesis option must satisfactorily complete at least **30 graduate credits**, which include the credits accumulated in the core curriculum. Students in this option must complete a master's thesis (6 credits) and give an oral presentation of the results.

Non-Thesis Option

Students in the non-thesis option must satisfactorily complete at least **34 graduate credits**, which includes the core curriculum, a 2–credit directed research project (ESCI 898 Directed Research), and a written and oral presentation of that research.

Hydrology

The core curriculum for the option in hydrology normally includes:

Code	Title	Credits
Required Courses		
ESCI 997	Seminar in Earth Sciences (first year)	1
ESCI 998	Proposal Development (first year)	1
Additional Courses		
ESCI 805	Principles of Hydrology	4
ESCI 810	Groundwater Hydrology	4
Master's Thesis or Directed Research		
Select from the following:		
ESCI 899	Master's Thesis	6
ESCI 898	Directed Research	2
Elective Courses		

Additional electives are to be selected from graduate level courses in the department and/or from graduate level courses in related disciplines outside of the department (e.g., civil and environmental engineering, natural resources, chemistry, mathematics and statistics, and computer science). More detailed information is available from the department.

Degree Plan

First Year		
Fall		**Credits**
ESCI 805	Principles of Hydrology	4
Elective 1 Course		3-4
ESCI 997	Seminar in Earth Sciences	1
	Credits	**8-9**
Spring		
ESCI 810	Groundwater Hydrology	4
Elective 2 Course		3-4
ESCI 998	Proposal Development	1
	Credits	**8-9**
Second Year		
Fall		
Elective 3 Course		3-4
ESCI 899	Master's Thesis (or Elective for non-thesis option)	3-4
	Credits	**6-8**
Spring		
Elective 4 Course		3-4
ESCI 899 or ESCI 898	Master's Thesis or Directed Research	2 or3
	Credits	**5-7**
	Total Credits	**27-33**

Accelerated Master's

This graduate program is approved to be taken on an accelerated basis in articulation with certain undergraduate degree programs.

General Accelerated Master's policy, note that some programs have additional requirements (e.g. higher grade expectations) compared to the policy.

Please see the Graduate School website and contact the department directly for more information.

Student Learning Outcomes

Program Learning Outcomes

Students graduating with a MS in Hydrology should achieve the following learning outcomes:

Core Knowledge

- Demonstrate knowledge of core concepts in the hydrologic sciences, including: 1) Conceptualizing a water budget and expressing it as a mathematical equation and 2) Understanding and proficient use of Darcy's Law

- Demonstrate general knowledge of hydrologic fluxes such as evaporation, precipitation, infiltration, and transpiration, and physical factors that affect them.
- Demonstrate an understanding of the uses and limitations of hydrologic models.
- Demonstrate specialized knowledge of a field within hydrology sufficient to conduct substantive supervised research.

Research Methods and Analysis

- Identify and demonstrate knowledge of a range of qualitative and quantitative methodologies typically used in hydrologic research.
- Discover and critically read published research in the Earth sciences and related fields of mathematics, statistics, physics, chemistry, and biology.
- Frame empirical research and/or theory guided by prior knowledge.
- Implement a rigorous study using appropriate methods, measures and techniques.
- Critically evaluate and systematically analyze data to reach appropriate findings and interpretations.

Scholarly Communication

- Structure a coherent argument that rigorously presents and evaluates evidence to support claims.
- Review and cogently synthesize relevant literature.
- Write at a level and in a style of English consistent with that found in leading academic journals.
- Understand and properly use styles of citing, referencing, and formatting found in leading academic journals.
- Clearly convey research findings through oral presentation supported by appropriate digital media.
- Cogently summarize research and its significance to non-specialist audiences.

Professionalism and Pedagogy

- Prepare manuscripts that meet the standards of academic and research journals and respond appropriately to recommendations for revision.
- Demonstrate collaboration, leadership and teamwork.
- Create a welcoming environment that is supportive, inclusive and equitable.
- Make effective contributions to university, community and professional service.
- Communicate effectively to groups in a lecture format.