ENGINEERING SCIENCE (PHD) - GEOLOGY & GEOLOGICAL ENGINEERING

Engineering Science (PHD) - Geology & Geological Engineering

Course Requirements

A student must complete the requirements for one of the emphasis areas. All doctoral programs require completion of a comprehensive examination, dissertation prospectus, and a dissertation. See the department chair or adviser for specific requirements for an emphasis area.

Geology & Geological Engineering

Emphasis - Environmental Engineering

Description

A Ph.D. in engineering science with emphasis in environmental engineering prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, or public service. Depending on their career focus, students can concentrate in any of the following specialty areas: water resources, watershed systems, hydrology, surface water quality, stormwater, wastewater, solid waste, air pollution, groundwater modeling and remediation, and remote sensing and geospatial technologies. Students entering the program come from a variety of engineering and nonengineering disciplines, such as geology, chemistry, biology, and mathematics.

Course Requirements

The Ph.D. with emphasis in environmental engineering requires 24 hours of course work beyond a master's degree or 48 hours beyond a bachelor's degree, and 18 hours of dissertation credit. At least two courses must be in mathematics (e.g., ENGR 5411 Engineering Analysis I, ENGR 5412 Engineering Analysis II, MATH 5051 Advanced Calculus I, MATH 5052 Advanced Calculus II, MATH 5351 Mathematical Statistics I), one course must be in numerical method (e.g., ENGR 5405 Finite Element Analysis I), and one course must be in mechanics (e.g., ENGR 6170 Continuum Mechanics). Other graduate course work must be approved by the student's advisory committee.

Other Academic Requirements

Completion of a qualifying examination, a comprehensive examination, a dissertation prospectus, and a dissertation defense is required. Before admission to candidacy, the student must pass written and oral comprehensive exams.

Emphasis - Hydrology & Comp Hydroscience

Description

A Ph.D. in engineering science with emphasis in hydrology and computational hydroscience prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, or public/government service. This degree is cross-listed between several departments within the School of Engineering. The student's home department is the same as the student's academic adviser's home department. This degree covers the fields of surface hydrology, groundwater hydrology, computational hydroscience and/or hydraulic engineering.

Course Requirements

For the Ph.D. in engineering science with emphasis in hydrology and computational hydroscience, a student must complete a minimum of 36 hours beyond the B.S. degree and 18 hours of dissertation credit. Graduate coursework must be approved by the student's advisory committee. Below is a full list of recommended courses. In addition to the previously mentioned credit hours, students must enroll in a 1-hour graduate seminar each semester.

Students must choose from this recommended list:

Code	Title	Hours
ENGR 5411	Engineering Analysis I	3
ENGR 5431	Approximate Methods of Engr Analysis I	3
ENGR 6090	Time Series Analysis	3
ENGR 6170	Continuum Mechanics	3
ENGR 6200	Advanced Remote Sensing	3
ENGR 6997A	Thesis	1-12
ENGR 6360	Groundwater Mechanics	3
ENGR 6370	Groundwater Modeling	3
ENGR 7110	Turbulence	3
ENGR 5475	Special Projects in Engineering Science	1-3
ENGR 5480	Special Projects in Engineering Science	1-3
ENGR 6032	Fluid Dynamics II	3
ENGR 5235	Environmental Remediation	3
ENGR 6450	Contaminant Transport	3
ENGR 6180	Vadose Zone Hydrology	3
ENGR 6160	Isotope Hydrogeology	3
ENGR 6270	Ray Methods in Electromagnetics	2-3
MATH 5051	Advanced Calculus I	3
MATH 5052	Advanced Calculus II	3
MATH 5351	Mathematical Statistics I	3
or MATH 7751	Advanced Statistics I	
MATH 5352	Mathematical Statistics II	3
or MATH 7752	Advanced Statistics II	
CIVE 5141	Flow in Open Channels	3
CIVE 5172	Stormwater Engineering and Management	3
CHME 5000	Advanced Transport Phenomena I	3
CHME 5102	Advanced Transport Phenomena II	3
GEOL 5000	Intro. to Geographic Information Systems	3
GEOL 5050	Hydrogeology	4
GEOL 6150	Geostatistics	3
GEOE 5100	Remote Sensing	3
GEOE 5030	Environmental Geochemistry	3
CSCI 5026	Parallel Computing	3
CSCI 5047	Digital Image Processing	3

Other Academic Requirements

Other academic requirements include passing written and oral comprehensive exams including dissertation prospectus and dissertation

defense. Before admission to candidacy, the student must pass written and oral comprehensive exams.

Emphasis - Geological Engineering

Description

A Ph.D. in engineering science with emphasis in geological engineering prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, or public/government service. Students entering the program come from a variety of engineering and nonengineering disciplines such as geology and physics.

Course Requirements

The Ph.D. with an emphasis in geological engineering requires 54 semester hours of graduate credit beyond the bachelor's degree; selection of courses must be approved by the student's advisory committee.

Other Academic Requirements

Successful completion of both written and oral comprehensive exams is required before undertaking the dissertation.

Emphasis - Geology

Description

A Ph.D. in engineering science with emphasis in geology prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, research and development, or public/government service. Students entering the program come from a variety of engineering and nonengineering disciplines such as geological engineering and physics.

Course Requirements

The Ph.D. with an emphasis in geology requires 54 semester hours of graduate credit beyond the bachelor's degree; selection of courses must be approved by the student's advisory committee.

Other Academic Requirements

Successful completion of both written and oral comprehensive exams is required before undertaking the dissertation.