ENGINEERING SCIENCE (PHD) -CIVIL ENGINEERING

Engineering Science (PHD) -Civil 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.

Civil Engineering

Emphasis - Civil Engineering

Description

A Ph.D. in engineering science with emphasis in civil engineering prepares a student with advanced technical knowledge and communication skills for pursuing a career in engineering research and development, education, industry, or public service. The program offers a choice of several concentration areas: structures, geotechnical engineering, construction materials, water resource engineering, environmental engineering, transportation systems, infrastructure asset management, and earthquake and disaster response management.

Goals/Mission Statement

The program will provide high quality graduate education in a range of civil engineering disciplines and will produce research and scholarship that is nationally recognized and supports the economic development of the state, the region, and the nation.

Course Requirements

The Ph.D. degree with emphasis in civil engineering requires the following coursework:

- For students entering the Ph.D. directly from a B.S.: 36 hours of coursework and 18 hours of dissertation.
- For students entering the Ph.D. from an M.S.: 24 hours of coursework and 18 hours of dissertation.
- For students entering the Ph.D. from an M.S. at the University of Mississippi: 12 hours of coursework and 18 hours of dissertation.

Combining the student's M.S. and Ph.D. programs, at least two courses need to 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 in numerical methods (e.g., ENGR 5405 Finite Element Analysis I), and one course in mechanics (e.g., ENGR 6170 Continuum Mechanics). Additional hours of Graduate Seminar may be required. Other graduate coursework must be approved by the student's advisory committee.

Other Academic Requirements

A qualifying examination, comprehensive examination, dissertation prospectus, and dissertation defense are needed. Before admission to candidacy, the student must pass written and oral comprehensive exams.

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. degree with emphasis in environmental engineering requires the following coursework:

- For students entering the Ph.D. directly from a B.S.: 36 hours of coursework and 18 hours of dissertation.
- For students entering the Ph.D. from an M.S.: 24 hours of coursework and 18 hours of dissertation.
- For students entering the Ph.D. from an M.S. at the University of Mississippi: 12 hours of coursework and 18 hours of dissertation.

Combining the student's M.S. and Ph.D. programs, at least two courses need to 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 in numerical methods (e.g., ENGR 5405 Finite Element Analysis I), and one course in mechanics (e.g., ENGR 6170 Continuum Mechanics). Additional hours of Graduate Seminar may be required. Other graduate coursework 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 6999A	Adv. Topics in Computational Mechanics	3
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
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 - Materials Science and Engineering

Description

A Ph.D. in engineering science with emphasis in materials science and 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 physics or chemistry.

Course Requirements

The Ph.D. with an emphasis in materials science and engineering requires 30 semester hours of course work beyond the master's degree as specified and approved by the student's advisory committee, plus 12 hours of research and 18 dissertation hours.

Other Academic Requirements

Written and oral qualifying examinations, comprehensive examinations, a dissertation prospectus, and the dissertation defense are required. Before admission to candidacy, the student must pass the written and oral comprehensive exams.