ENGINEERING SCIENCE (MS) - CIVIL ENGINEERING

Description

The M.S. in engineering science is offered in a number of emphasis areas: aeroacoustics, biomedical engineering, chemical engineering, civil engineering, computational hydroscience, computer engineering, computer science, electrical engineering, electromagnetics, environmental engineering, geology, geological engineering, hydrology, mechanical engineering, material science and engineering, and telecommunications.

Minimum Total Credit Hours: 30

Course Requirements

A student must complete the requirements for an emphasis area. For most emphasis areas, the degree may be completed as a:

- Thesis option (30-hour program, to include 6 hours of thesis),
- Nonthesis option (30- hour program, to include a minimum of 3 hours of a design-oriented project course), or
- Coursework option (30-hour program, to include a final oral examination in front of a committee, but no written report)

Emphasis - Civil Engineering

Description

A degree of M.S. in engineering science with emphasis in civil engineering prepares a student with advanced technical knowledge and communication skills for pursuing a career in industry, engineering research and development, public service, or for doctoral work. 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 thesis option for the M.S. with emphasis in civil engineering requires at least 24 hours of course work and at least 6 hours of thesis credit (ENGR 6997A Thesis) with a thesis defense. The nonthesis option requires 27 hours of course work and a 3-hour project or research course (ENGR 6999F Special Topics in Engineering Science or ENGR 6999D Research Topics in Engineering Science I) with a written report and oral presentation.

Required graduate course work for either option includes at least one course in mathematics (e.g., ENGR 5411 Engineering Analysis I, MATH 5051 Advanced Calculus I, MATH 5052 Advanced Calculus II, MATH 5351 Mathematical Statistics I); one course in numerical method (e.g., ENGR 5405 Finite Element Analysis I); and one course in mechanics (e.g., ENGR 6170 Continuum Mechanics). Other graduate course work must be approved by the student's adviser.

Other Academic Requirements

For either option, a candidate must pass a final oral examination.

Emphasis - Environmental Engineering

Description

A M.S. 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, public service, or for doctoral work. 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.

Goals/Mission Statement

The program will provide high quality graduate education in a range of environmental 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 M.S. with emphasis in environmental engineering can be completed as either a thesis or nonthesis option. The thesis option requires at least 24 hours of course work and at least 6 hours of thesis credit (ENGR 6997A Thesis) with a thesis defense. The nonthesis option requires 27 hours of course work and a 3-hour project or research course (ENGR 6999F Special Topics in Engineering Science or ENGR 6999D Research Topics in Engineering Science I) with a written report and oral presentation.

The graduate course work for either option must include at least one course in mathematics (e.g., ENGR 5411 Engineering Analysis I, MATH 5051 Advanced Calculus I, MATH 5052 Advanced Calculus II, MATH 5351 Mathematical Statistics I), one course in numerical method (e.g., ENGR 5405 Finite Element Analysis I), and one course in mechanics (e.g., ENGR 6170 Continuum Mechanics). Other graduate course work must be approved by the student's adviser.

Emphasis - Hydrology & Comp Hydroscience

Description

An M.S. in engineering science with an 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, public service, or for doctoral work. 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. It covers the fields of surface hydrology, groundwater hydrology, computational hydroscience and/or hydraulic engineering.

Course Requirements

For the M.S. in engineering science with emphasis in hydrology and computational hydroscience, a student must complete 24 credit hours of coursework (plus at least 6 thesis hours). 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
ENGR 6270	Ray Methods in Electromagnetics	2-3
MATH 5051	Advanced Calculus I	3
MATH 5052	Advanced Calculus II	3
MATH 5351/7751	Mathematical Statistics I	3
MATH 5352/7752	Mathematical Statistics II	3
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

For either option, a candidate must pass a final oral examination.

Emphasis - Materials Science and Engr

Description

A M.S. 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, public service, or for doctoral work.

Course Requirements

The M.S. with emphasis in materials science and engineering can be completed as either a thesis or nonthesis option. The thesis option requires a minimum of 24 hours of course work as specified and approved by the student's adviser and 6 hours minimum of thesis credit. A nonthesis "project option" entails 27 hours of approved course work and 3 hours of a research project, plus a written report on the project and a comprehensive oral exam covering the project and all course work.

Other Academic Requirements

For either option, a candidate must pass a final oral examination.