ENGINEERING SCIENCE (PHD) - CHEMICAL ENGINEERING

Engineering Science (PHD) - Chemical 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.

Chemical Engineering

Emphasis - Aeroacoustics

Description

A Ph.D. in engineering science with emphasis in aeroacoustics 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.

Course Requirements

The Ph.D. with emphasis in aeroacoustics requires a minimum 66 semester hours of graduate credit beyond the baccalaureate degree. The student's adviser must approve all course selections.

Other Academic Requirements

At the adviser's discretion, a preliminary examination may be required at or near the beginning of the student's work beyond the master's degree. A comprehensive written examination must be passed before entering the dissertation process.

Emphasis - Chemical Engineering

Description

A Ph.D. in engineering science with emphasis in chemical engineering prepares graduates to apply chemical engineering science (transport phenomena, thermodynamics, chemical reaction engineering, and applied mathematics). It enables them to independently execute complex projects and pursue successful careers in engineering, medicine, law, professional education, public policy, the military, management, and sales. It further equips them with the experience to conduct research — generating and disseminating new knowledge.

Course Requirements

The Ph.D. with an emphasis in chemical engineering requires a minimum of 54 hours of graduate credit past the bachelor's degree. No specific courses are required beyond those specified for the M.S. thesis option. The remainder of the coursework is agreed upon by the student and his or her committee, 18 hours of which must be dissertation (ENGR 7998A Dissertation) credit. Students whose undergraduate degree is not in chemical engineering may need to take additional courses to satisfy prerequisites.

Other Academic Requirements

Students in the Ph.D. track must achieve a GPA of 3.25 or higher on 12 credit hours selected by the committee from ENGR 6650 Thermodynamics of Chemical Systems, ENGR 6691 Chemical Reaction and Reactor Analysis I or any CHME 5000-/6000-level course. Selection must be done by the end of the first semester. To be admitted to candidacy, the student must successfully complete the preselected courses and pass a qualifying examination. The exam consists of writing and defending an Original Research Proposal (ORP). After the ORP, the Ph.D. candidate must successfully complete a dissertation prospectus, then write and defend a dissertation.

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 - 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.

Dissertation
The student will be eligible to defend his or her dissertation upon: * Completion of at least 18 hours of ENGR 7998A Dissertation * Having anticipated completion of the minimum 54 total credit hours by the end of the term of graduation * Approval by the student's committee who will evaluate if the elements of the prospectus have been sufficiently addressed. This defense approval committee meeting cannot occur during the same full term (fall, spring, full summer) as the anticipated defense, and there must be a minimum of four calendar months between these events. The committee's approval or denial to proceed toward a goal dissertation date must be submitted to and acknowledged by the graduate program coordinator. If denied, there must be written justification.

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