

## [Emphasis - Hydrology & Comp Hydroscience](#)

- [Ph.D. in Engineering Science](#)
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### **Ph.D. in Engineering Science** **Description**

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

#### **Minimum Total Credit Hours: 54** **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.

### **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:

- Engr 591 - Engineering Analysis I
- Engr 593 - Approximate Methods of Engr Analysis I
- Engr 609 - Time Series Analysis
- Engr 617 - Continuum Mechanics
- Engr 620 - Advanced Remote Sensing
- Engr 625 - Adv. Topics in Computational Mechanics
- Engr 636 - Groundwater Mechanics
- Engr 637 - Groundwater Modeling
- Engr 711 - Turbulence
- Engr 597 - Advanced Geospatial Analysis
- Engr 598 - Water and Wastewater Treatment
- Engr 604 - Fluid Dynamics II
- Engr 573 - Environmental Remediation
- Engr 645 - Contaminant Transport
- Engr 618 - Vadose Zone Hydrology
- Engr 616 - Isotope Hydrogeology
- Engr 627 - Applied Probability Modeling
- Math 555 - Advanced Calculus I
- Math 556 - Advanced Calculus II
- Math 575 (675 / 775) - (Advanced) Mathematical Statistics I
- Math 576 (676 / 776) - (Advanced) Mathematical Statistics II
- C E 541 - Flow in Open Channels
- C E 572 - Stormwater Engineering and Management
- Ch E 560 - Advanced Transport Phenomena I
- Ch E 561 - Advanced Transport Phenomena II
- Geol 500 - Introduction to GIS
- Geol 505 - Hydrogeology
- Geol 615 - Geostatistics
- G E 510 - Remote Sensing
- G E 503 - Environmental Geochemistry
- Csci 526 - Parallel Computing
- Csci 547 - Digital Image Processing

### **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.

