The availability of usable freshwater is a fundamental requirement for drinking water, food production, power generation, and the extraction and processing of natural resources such as oil, gas, and minerals. Global demands for food, energy, and water are expected to rise by 60% by 2050. On a global scale, the availability and access to clean drinking water is the single largest factor affecting human health.

To help prepare students who will address these grand societal challenges, we offer a non-thesis based MS-degree in Water Science and Engineering (WSE). The WSE program integrates the expertise in Civil Engineering, Environmental Engineering, Chemistry, Chemical Engineering, Geology, Geological Engineering, and Biology to provide students with a tailored interdisciplinary experience. Students in the WSE degree program will take courses in the following focus areas (1) Engineering Hydrology, (2) Water Infrastructure and Remediation, (3) Water Resources and the Environment, and (4) Water Policy.

### Master of Science
#### Water Science and Engineering

The Water Science and Engineering (WSE) Master of Science (MS) degree requires a total of 30 graduate credit hours beyond the B.S. degree. The program is non-thesis only. We encourage applications from students with undergraduate degrees from one of the seven participating programs (Biological, Chemistry, Chemical Engineering, Civil Engineering, Environmental Engineering, Geology and Geophysics, and Geological Engineering) or closely related degree programs. Graduate certificates in Subsurface Water Resources and/or Surface Water Resources can serve as an entry point into the WSE program.

The program is comprised of the following:

- **Program Courses**: Students will select six courses (18hrs) from the Program Course List. Students must take at least one course from three different course categories and also take at least one course from three separate departments. Course categories include Engineering Hydrology, Water Infrastructure and Remediation, Water Resources and the Environment, and Water Policy.

- **Additional Courses**: Students will select four courses (12 hrs) from a combination of existing and newly developed graduate courses that are relevant to their degree plans. These courses must be approved by their advisor and will be chosen based on the student’s specific career goals and interests.

The non-thesis WSE MS-degree is offered both on campus and online.

#### Engineering Hydrology

- **CIV ENG 6331** Advanced Open-Channel Hydraulics
- **CIV ENG 5338** Hydrologic Engineering
- **CIV ENG 5330** Unsteady Flow Hydraulics
- **CIV ENG 5331** Hydraulics Of Open Channels
- **CIV ENG 5333** Intermediate Hydraulic Engineering
- **CIV ENG 5337** River Mechanics And Sediment Transport
- **CIV ENG 6338** Advanced Hydrology
- **GEO ENG 5220** Groundwater Modeling
- **GEO ENG 5321** Subsurface Hydrology
- **GEO ENG 5322** Fundamentals of Groundwater Hydrology
- **GEO ENG 6331** Advanced Subsurface Hydrology

#### Water Infrastructure and Remediation

- **CIV ENG 5335** Water Infrastructure Engineering
- **CIV ENG 6340** Urban Hydrology
- **CIV ENG 6335** Hydraulic Structures
- **BIO SCI 6463** Bioremediation
- **CHEM ENG 4210** Biochemical Reactors
- **CHEM ENG 5110** Intermediate Chemical Reactor Design
- **CIV ENG 5332** Transport Processes in Environmental Flows
- **CIV ENG 5360** Water Resources And Wastewater Engineering
- **ENV ENG 5630** Remediation of Contaminated Groundwater And Soil
- **ENV ENG 5635** Phytoremediation and Natural Treatment Systems: Science and Design
- **ENV ENG 5619** Environmental Engineering Design
- **ENV ENG 6612** Biological Operations In Environmental Engineering Systems
- **ENV ENG 6611** Physicochemical Operations In Environmental Engineering Systems
- **GEO ENG 6237** Advanced Geological & Geotechnical Design For Hazardous Waste Mgt
- **GEO ENG 5239** Groundwater Remediation
- **GEO ENG 5381** Intermediate Subsurface Hydrology And Contaminant Transport Mechs

#### Water Resources and the Environment

- **BIO SCI 4313** Introduction to Environmental Microbiology
- **BIO SCI 6313** Environmental Microbiology
- **BIO SCI 4383** Toxicology
- **BIO SCI 5363** Freshwater Ecology
- **BIO SCI 6363** Advanced Freshwater Ecology
- **BIO SCI 6383** Advanced Toxicology
- **CHEM ENG 5340** Principles of Environmental Monitoring
- **CHEM 4710** Principles Of Environmental Monitoring
- **CHEM 5710** Environmental Monitoring
- **ENV ENG 5605** Environmental Systems Modeling
- **ENV ENG 5642** Sustainability, Population, Energy, Water, and Materials
- **GEOLOGY 4431** Methods Of Karst Hydrogeology
- **GEOLOGY 4411** Hydrogeology
- **GEOLOGY 4451** Aqueous Geochemistry
- **GEO ENG 5153** Regional Geological Engineering Problems In North America
- **GEO ENG 5233** Risk Assessment In Environmental Studies
- **GEO ENG 5782** Environmental and Engineering Geophysics
- **GEO ENG 5736** Advanced Geophysical Methods

#### Water Policy

- **CIV ENG 5640** Environmental Law And Regulations
- **CIV ENG 5650** Public Health Engineering
- **POL SCI 4500** Geopolitics and International Security
- **POL SCI 4320** The Politics of Innovation
- **ECON 4440** Environmental And Natural Resource Economics

Entrance requirements are equivalent to the baseline university graduate student admission standards. The GRE exam is not required for internal degree applicants.