

## **Surface Water Quality Engineering**

Typical Schedule  
M.S., Environmental Engineering  
M.S., Environmental Engineering Science

### **Requirements**

Each student's class schedule and thesis topic are designed and agreed upon by the student and advisor. Students pursuing a research degree typically balance their coursework and research credits as follows:

- Course work credits: 20-22 (12 cr. above 5000-level)
- Research and thesis:  $\geq 10$  credits

### **Core Coursework**

All graduate students in Civil & Environmental Engineering are encouraged to take Environmental Process Engineering (CE5501), a course that introduces concepts in reactor design and chemical kinetics fundamental to all environmental disciplines. Beyond this, students may develop a strong foundation in surface water quality based on three courses offered annually by Drs. Auer and Urban.

- CE4505 Surface Water Quality Engineering (Fall; 3 credits)
- CE5501 Environmental Process Engineering (Fall; 3 credits)
- CE5504 Surface Water Quality Modeling (Spring; 3 credits)
- CE5508 Biogeochemistry (Spring; 3 credits)

### **Breadth and Depth**

Students have the opportunity to select additional courses, tailoring their schedule to individual interests and backgrounds as well as to the needs of their research projects. Some students seek additional depth in surface water quality and related fields, while others branch out to establish capabilities in a single discipline or to sample courses in a variety of areas. The course clusters presented below outline these opportunities but are not intended to cover all possibilities.

#### **Ecology**

- BL4450 Limnology (Fall; 4 credits)
- BL5451 Aquatic Ecology (Fall; 4 credits)
- BL5460 Advanced Ecology: Ecosystems (Spring; 3 credits)
- FW4220 Wetlands (Fall; 4 credits)

### Environmental Chemistry

- CE4501 Environmental Engineering Chemical Processes (Fall; 4 credits)
- CE5509 Environmental Organic Chemistry (Fall; 3 credits)
- GE5220 Aqueous Geochemistry (On Demand; 3 credits)

### Environmental Policy

- SS3620 International Environmental Technology Policy (Fall, Spring; 3 credits)
- SS3800 Energy Technology and Policy (Spring; 3 credits)
- SS5200 Environmental Decision Making (Spring; 3 credits)
- SS5300 Environmental Policy & Politics (Fall; 3 credits)
- SS5350 Environmental Policy analysis (Spring; 3 credits)
- SS5400 Sociology of the Environment (Fall; 3 credits)
- SS5510 Sustainable Futures I (Fall; 3 credits)

### GIS and Remote Sensing

- BL5520 Satellite Limnology (On Demand; 3 credits)
- FW4540 Remote Sensing of the Environment (Fall; 3 credits)
- GL4250 Fundamentals of Remote Sensing (Spring; 3 credits)
- FW5550 GIS for Resource Management (Fall, 4 credits)

### Math and Statistics

- BL4470 Analysis of Biological Data (Spring; 4 credits)
- MA4710 Regression Analysis (Spring; 3 credits)
- MA4720 Design and Analysis of Experiments (Fall; 3 credits)
- MA4750 Applied Multivariate Statistics (Fall; 3 credits)
- MA4760 Mathematical Statistics I (Fall; 3 credits)
- MA4770 Mathematical Statistics II (Spring; 3 credits)

### Modeling and Numerical Methods

- GE5800 Earth Systems Modeling (Spring; 3 credits)
- CE5666 Systems Optimization (Spring; 3 credits)

### Water Resources

- CE5660 Hydrology II
- CE5665 Sediment transport (spring) 3 cr
- CE5666 Systems Optimization (spring) 3 cr.

### Wastewater Treatment

- CE5502 Biological Wastewater Treatment
- CE5503 Physical Chemical Treatment
- CE5507 Sorption and Bioremediation