



Soil and Watershed Science

The concentration in Soil and Watershed Science provides students with one of the top soil science programs in the nation. The concentration enables students to understand the complex ways in which aquatic and terrestrial ecosystems are influenced by soil properties and processes and land management decisions. The soil performs such critical ecological functions as supplying and purifying water, recycling wastes, nurturing plants, modifying the atmosphere by emitting or sequestering gases and particulates, providing habitat for the most diverse biological communities on Earth, and serving as a medium for human engineering projects.

ENST Core (44 credits)

- ▲ **BSCI 170&171** Principles of Molecular & Cellular Biology (F, Sp, Su; 4)
- ▲ **MATH 120** Elementary Calculus I (F, Sp; 3)
- ▲ **BSCI 160&161** Principles of Ecology & Evolution (F, Sp, Su; 4)
- ▲ **CHEM 131&132** Fundamentals of General Chemistry & Lab (F, Sp, Su; 4)
- ▲ **ENST 200** Fundamentals of Soil Science (F, Sp; 4)
- ▲ **ENST 233** Introduction to Environmental Health (F, Sp; 4)
- ▲ **CHEM 231&232** Organic Chemistry I & Lab (F, Sp, Su; 4)
- ▲ **PHYS 121** Fundamentals of Physics (F, Sp, Su; 4)
- ▲ **GEOG 306** Introduction to Quantitative Methods for the Geographic Environmental Sciences (F, W, Sp, Su; 3) **-or-**
- ▲ **BIOM 301** Introduction to Biometrics (F, W, Sp, Su; 3)
- ▲ **ENST 360** Ecosystem Ecology (F; 4)
- ◆ **ENST 389** Professional Internship (3)
- ◆ **Senior Integrative Experience** (F, Sp; 3)
 - ENST 388 Honors Thesis Research (3) **-or-**
 - ENST 470 Ideas into Impact: Scholarship and Practice (3) **-or-**
 - ENST 486 Senior Professional Internship (3) **-or-**
 - ENST 489 Research Experience (Group or individual project) (3)

Concentration Core (7 credits)

- GEOL 100/110** Physical Geology (F, Sp; 4)
- GEOG 372** Remote Sensing (F, W, Sp, Su; 3) **-or-**
- GEOG 373** Geographic Information Systems (F, W, Sp, Su; 3) **-or-**
- ENST 456** Spatial Analysis and Ecological Sampling (TBA; 3) **-or-**
- INAG 237** Surveying and GPS Applications in Agriculture (F; 3)

Concentration Depth - Soil Sciences (at least 9 credits - choose 3 courses)

- ENST 411** Principles of Soil Fertility (F; 3)
- ◆ **ENST 414** Soil Morphology, Genesis and Classification (F; 4)
- ◆ **ENST 417** Soil Hydrology and Physics (F; 3)
- ◆ **ENST 421** Soil Chemistry (Sp; 4)
- ◆ **ENST 422** Soil Microbial Ecology (F; 3)

Concentration Depth - Field Experience (at least 3 cr. - choose 1-3 courses)

- ENST 301** Field Soil Morphology I (F; 1) (Soil Judging Team)
- ENST 302** Field Soil Morphology II (F; 1) (Soil Judging Team)
- ENST 303** Field Soil Morphology III (F; 1) (Soil Judging Team)
- ENST 309** Advanced Field Soil Morphology (Sp; 1) (Soil Judging Team)
- ENST 424** Field Study in Soil Morphology (Su, TBA; 4)
- ENST 430** Wetland Soils (Sp; 3)
- ENST 441** Sustainable Agriculture (F even; 3)
- ENST 450** Wetland Ecology (F; 3)

Concentration Depth - Systems (at least 6 credits - choose 2 courses):

- AREC 365** World Hunger, Population, and Food Supply (F, Sp; 3)
- ENST 410** Ecosystem Services: An Integrated Analysis (F; 3)
- ENST 432** Environmental Microbiology (Sp; 3)
- PLSC 400** Plant Physiology (Sp; 4)

- ▲ Benchmark to be completed by 30 credits
- ▲ Benchmark to be completed by 60 credits
- ▲ Benchmark to be completed by 90 credits
- ◆ Requires prior approval
- ◆ Required for Soil Certification Exam

Students must maintain an overall GPA of 2.0 and a grade of C- or better for all ENST required classes.

Courses not selected here may count as technical electives on the back, but cannot be counted as both an elective and as a concentration CORE/DEPTH course.

Any combination of electives can be taken. Courses appear in blocks of related topics to assist students in tailoring their program to particular interests with Soil and Watershed Science. Under some circumstances, other 300 or 400 level electives can be substituted with advisor's approval.



Electives (Choose 3 or 4 Courses to complete 12 credits)

Agriculture and Sustainable Land Use

AREC 365 World Hunger, Population, and Food Supply (F, Sp; 3)

GEOG 372 Remote Sensing (F, Sp; 3)

PLSC 303 Global Food Systems (Sp; 3)

PLSC 400 Plant Physiology (Sp; 4)

PLSC 405 Agroecology (F; 3)

(PLSC 101 and PLSC 201 recommended to fulfill prerequisites for PLSC 400)

Soil Ecology

BSCI 223 General Microbiology (F, Sp; 4)

BSCI 337 Biology of Insects (Sp; 4)

BSCI 467 Freshwater Biology (F; 4)

ENST 410 Ecosystems Services: An Integrated Analysis (F; 3)

ENST 432 Environmental Microbiology (Sp; 3)

Geosciences

GEOL 322 Mineralogy (4)

GEOL 340 Geomorphology (Sp; 4)

GEOL 341 Structural Geology (Sp; 4)

GEOL 342 Sedimentation and Stratigraphy (F, Sp; 4)

GEOL 444 Low Temperature Geochemistry (F; 4)

Watersheds

ENST 334 Environmental Toxicology (Sp; 3)

ENST 423 Soil-Water Pollution (Sp; 3)

ENST 453 Watershed Science: Water Balance, Open Channel Flow, and Near Surface Hydrology (Sp; 3)

GEOL 451 Groundwater (F; 3)

GEOL 452 Watershed and Wetland Hydrology (F; 3)

GEOL 453 Ecosystem Restoration (F; 3)