SOILS (SOIL)

SOIL 205 The Soil Ecosystem
3 credits
*Gen Ed: Natural and Applied Sciences*
Introduction to the physical, chemical, and biological nature of soils.
*Prereq:* CHEM 101 or CHEM 111 or Instructor Permission.

SOIL 206 The Soil Ecosystem Lab
1 credit
*Gen Ed: Natural and Applied Sciences*
Lab study relevant to SOIL 205. Experiments and demonstrations on basic and applied aspects of soil science. One 3-hour lab a week. *Coreq:* SOIL 205.

SOIL 210 Food Systems and Healthy Lifestyles
3 credits
Introduction to food systems including the historical development of our current global food system. Linkages among the production, marketing and transportation of food and food policy on human health will be explored. Students will complete a semester-long assessment of the local food system and its impacts on individual, school and community health and strategies to improve the food system.

SOIL 299 (s) Directed Study
Credit arranged.

SOIL 398 (s) Internship
1-6 credits, max 6
Graded P/F.
*Prereq:* Permission of department.

SOIL 400 (s) Seminar
Credit arranged.

SOIL 404 (s) Special Topics
Credit arranged.

SOIL 415 Soil and Environmental Physics
3 credits
Joint-listed with SOIL 515
Physical properties of soils and their relationships to moisture, aeration, and temperature; plant-soil-atmospheric relationships; solute transport and soil salinity. Two lec and one 3-hr lab a wk.
*Recommended Preparation:* SOIL 205, SOIL 206, and PHYS 111. SOIL 415 is a cooperative course available to WSU degree-seeking students. (Alt/ yrs, Fall)

SOIL 417 Market Garden Practicum
1-6 credits
Experiential learning based course that covers all aspects of running a small acreage vegetable farm. Topics include farm planning, crop rotation, soil fertility and testing, weed management and food systems. Students satisfy credit hours through participation in lecture/discussion, field work and field trips. Class meets at the Plant Science Farm.
*Recommended preparation:* SOIL 205. (Summer only)

SOIL 422 Environmental Soil Chemistry
3 credits
Chemical processes in soil environment. Recommended Preparation: SOIL 205, SOIL 206, and CHEM 112. Cooperative: open to WSU degree-seeking students. (Alt/ys)

SOIL 425 Microbial Ecology
3 credits
Joint-listed with SOIL 525
Biogeochemical activities and relationships of microorganisms in soil, water, plants, and animals. Extra oral and/or written assignments required for graduate credit. Recommended Preparation: MATH 137 or 143. (Spring alt/ys).
*Prereq:* BIOL 154 or 250.

SOIL 427 Sustainable Food Systems
3 credits
Joint-listed with SOIL 527
The purpose of this course is to help students apply systems thinking and systems methodological problem solving skills to identify and describe current and future food system issues. Through lectures, case studies and research students will explore elements and behavior of food systems that impart sustainability. Students taking the course for graduate credit will complete additional readings, research and presentations.
*Prereq:* FOR 221, REM 221, or SOIL 210; or Instructor Permission.

SOIL 438 Pesticides in the Environment
3 credits
*Gen Ed: Senior Experience*
Cross-listed with ENT 438 and PLSC 438
Principles of pesticide fate in soil, water, and air; pesticide metabolism in plants, pesticide toxicology, and pesticide mode-mechanism of action; pest resistance to pesticides; biotechnology in pest control; regulations and liability; equipment application technology; pesticide transport, storage, and disposal; and social and ethical considerations.
*Recommended Preparation:* CHEM 275.

SOIL 446 (s) Soil Fertility
1-3 credits, max 3
Principles of soil fertility management; availability of plant nutrients and their relationship to plant growth and fertilization practices.
*Recommended Preparation:* SOIL 205 and 206.

SOIL 450 Environmental Hydrology
3 credits
Cross-listed with ENVS 450
Carries no credit after BE 355 or CE 325. Comprehensive understanding of the hydrologic processes associated with the environmental processes. Includes components of the hydrologic cycle, analysis of precipitation and run off, evapotranspiration, routing, peak flow, infiltration, soil and water relationships, snowmelt, and frequency analysis. (Spring only)
*Prereq:* MATH 170.

SOIL 454 Pedology
3 credits
*Morphology, genesis, and classification of soils; distribution of soils as related to environmental processes and factors. Two lectures and one 4-hr lab a week. Recommended Preparation:* SOIL 205 and SOIL 206. Cooperative: open to WSU degree-seeking students.

SOIL 456 North Idaho Field Trip
1 credit
Soils and land use in northern Idaho ecosystems; emphasis on soil parent materials, soil formation and morphology, and soil-plant community relationships. Graded P/F. One 3-day field trip; additional class meetings and assignments before and after field trip. Cooperative: open to WSU degree-seeking students.
*Prereq:* SOIL 205 or Permission.

SOIL 499 (s) Directed Study
Credit arranged.
SOIL 500 Master's Research and Thesis
Credit arranged.

SOIL 501 (s) Seminar
Credit arranged.

SOIL 502 (s) Directed Study
Credit arranged.

SOIL 504 (s) Special Topics
Credit arranged.

SOIL 514 Environmental Geophysics
3 credits
This course will provide an introduction to near-surface geophysical techniques. The aim is to provide a solid foundation on physical principles used to non-invasively study characteristics and properties of the earth in general, and the shallow subsurface in particular. We will discuss applications ranging from eco-hydrology, precision agriculture, and civil engineering to archeology. The course consists of two parts. Lectures will provide a conceptual understanding of the theory and methods, and a field-based case study will apply these concepts collecting integrated geophysical data that will be processed and interpreted to introduce students to practical procedures and challenges in environmental geophysics. Cooperative: open to WSU degree-seeking students.

SOIL 515 Soil and Environmental Physics
3 credits
Joint-listed with SOIL 415
Physical properties of soils and their relationships to moisture, aeration, and temperature; plant-soil-atmospheric relationships; solute transport and soil salinity. Two lec and one 3-hr lab a wk.
Recommended Preparation: SOIL 205, SOIL 206, and PHYS 111. SOIL 415 is a cooperative course available to WSU degree-seeking students. (Alt/ yrs, Fall)

SOIL 525 Microbial Ecology
3 credits
Joint-listed with SOIL 425
Biogeochemical activities and relationships of microorganisms in soil, water, plants, and animals. Extra oral and/or written assignments required for graduate credit. Recommended Preparation: MATH 137 or 143. (Spring alt/yrs).
Prereq: BIOL 154 or 250.

SOIL 527 Sustainable Food Systems
3 credits
Joint-listed with SOIL 427
The purpose of this course is to help students apply systems thinking and systems methodological problem solving skills to identify and describe current and future food system issues. Through lectures, case studies and research students will explore elements and behavior of food systems that impart sustainability. Students taking the course for graduate credit will complete additional readings, research and presentations.
Prereq: FOR 221, REM 221, or SOIL 210; or Instructor Permission.

SOIL 537 Soil Biochemistry
3 credits
Origin, chemical structure, and significance of soil biochemical compounds. Cooperative: open to WSU degree-seeking students. (Alt/yrs)
Prereq: SOIL 422, BIOL 380, BIOL 250 or Permission.

SOIL 597 (s) Practicum
Credit arranged.

SOIL 598 (s) Internship
Credit arranged
Graded P/F.
Prereq: Permission.

SOIL 599 (s) Research
Credit arranged
Research not directly related to a thesis or dissertation.
Prereq: Permission.

SOIL 600 Doctoral Research and Dissertation
Credit arranged.