

SOIL SCIENCE (SOIL)

SOIL 7100 Soil Physical Chemistry 3 cr

Topics of discussion: ionic equilibria, ion exchange and ionic transport including soil-plant relationships.

SOIL 7110 Soil Physics I - General 3 cr

First and second laws of thermodynamics, Darcy's law, saturated and unsaturated flow, simulation modeling of moisture movement, soil aeration, water availability to seeds, strength properties of unsaturated soils.

SOIL 7130 Soil Chemistry 3 cr

Chemical equilibria and soil solution chemistry; surface chemistry and solid-solution reactions; mineral structure, colloid chemistry and analytical techniques; fate of nutrients and pollutants; reactions of fertilizers.

SOIL 7140 Soil Nitrogen 3 cr

Discussion of organic and inorganic nitrogen in soils, nitrogen fixation, mineralization, nitrification, denitrification, and plant availability of soil nitrogen. Students will be required to review literature on assigned topics.

SOIL 7170 Agricultural Micrometeorology 3 cr

Discussion of mass and energy transport in the boundary layer, evaporation and transpiration of water, light absorption and transmission of carbon dioxide in plant canopies and climate change impacts on micrometeorological processes.

PR/CR: A minimum grade of C is required unless otherwise indicated.

Prerequisite: SOIL 3060 and/or consent of instructor.

SOIL 7180 Environmental Chemistry of Pesticides and Related Compounds 3 cr

Pesticide chemodynamics, biological and non-biological transformations of pesticides in water, soil and biota, bioaccumulation and food chain distribution of pesticides and related xenobiotics and environmental fate models will be discussed.

PR/CR: A minimum grade of C is required unless otherwise indicated.

Prerequisite: Consent of instructor.

SOIL 7210 Topics in Soil Fertility 3 cr

Advanced study of behaviour and crop requirements for selected nutrients (except for nitrogen, as covered in SOIL 7140. Students will be required to review literature and prepare seminars on assigned topics.

PR/CR: A minimum grade of C is required unless otherwise indicated.

Prerequisites: SOIL 4520 or consent of instructor.

SOIL 7220 Principles of Scientific Research and Communication 3 cr

Principles of scientific research; management skills; writing skills; oral and poster presentation; preparation of research proposal and thesis (pass/fail). These topics will focus on aspects of soil science and will give students experience in writing and presenting scientific material to increase their professionalism as soil scientists.

PR/CR: A minimum grade of C is required unless otherwise indicated.

Prerequisite: Consent of instructor.

SOIL 7230 Topics in Landscape and Processes I 3 cr

An examination of methods of landscape characterization and of landscape processes, their impacts, interactions and modelling.

PR/CR: A minimum grade of C is required unless otherwise indicated.

Prerequisite: Consent of instructor.

SOIL 7240 Topics in Landscape Processes II 3 cr

A continuation of SOIL 7230.

PR/CR: A minimum grade of C is required unless otherwise indicated.

Prerequisite: Consent of instructor.

SOIL 7250 Topics in Soil Science 3 cr

Several courses in soil science are sectioned into modules. Modules of one credit hour on special topics are also available. Students may select three modules from the various courses or from special topics for SOIL 7250.

SOIL 7270 Advanced Soil Ecology 3 cr

Examine the role of soil organisms and their communities in decomposition, elemental cycling, and pathogen/pest suppression in managed and natural soil systems. Understand methods of studying biochemical activity and communities in soil. Take a specific research topic of choice and develop an understanding of the organisms and communities, environmental controls of key biological processes involved and apply your knowledge to resolving a specific research issue.