

# ENVIRONMENTAL SCIENCE (ESCI)

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## ESCI 504 Field Studies in Env Science 2 Credit Hours

A systematic analysis of the environment. This course will focus on the analysis of the Rouge River Watershed as an ecological unit. The student will make intensive analyses of the river water and the surrounding land surface at selected sites. The results will provide a composite of the water quality and land use of the various tributaries. Emphasis will be placed on proper sampling and testing techniques, field and lab safety procedures, aquatic chemistry, biological organisms as indicators of pollution, and the role of wastewater dumping on the watershed.

## ESCI 525 Soil in the Environment 3 Credit Hours

The study of soil in the environment, including its formation, classification, physical attributes and engineering properties with an emphasis on soil-water statics and dynamics, chemical attributes and processes. Students are expected to have background knowledge of physical geology. The course will include field trips and field work, including the collection of soil samples from the Universities natural area. The course will also include a laboratory component in which students will perform a variety of test, e.g. bulk density, engineering properties on the soil samples collected. the course will typically be team taught. (S, AY)

**Prerequisite(s):** GEOL 118

### **Restriction(s):**

Can enroll if Level is Rackham or Graduate

Can enroll if College is Engineering and Computer Science or Education, Health, and Human Services or Business or Arts, Sciences, and Letters

## ESCI 572 Environmental Communications 3 Credit Hours

Preparation and presentation of both oral and written technical abstracts and reports, including environmental newsletters, thesis, and media releases. Professional scientists must be able to effectively communicate ideas and concepts to other scientists and to the general public. This course will provide the foundations in learning how to communicate ideas effectively and succinctly. (F, YR)

### **Restriction(s):**

Can enroll if Class is Senior or Graduate

Can enroll if College is Arts, Sciences, and Letters

## ESCI 574 Watershed Analysis 3 Credit Hours

An interdisciplinary study of watersheds, the most commonly used bio-regional unit. The course integrates the analysis of many factors which contribute to the character of watersheds, including bedrock and surficial geology, surface and groundwater hydrology, social history, land use history, water quality analysis, biological diversity, laws and regulations, management models, drinking water and wastewater systems, best management practices, and educational programs. The Rouge River watershed will serve as the primary case study.

### **Restriction(s):**

Can enroll if Class is Graduate

## ESCI 577 Environmental Field Methods 1 Credit Hour

An intensive, off-campus field course that provides students an opportunity to observe and critically study different natural and human environments. Students learn how to collect data in a systematic way and formulate scientific inferences about environmental processes, products, and problems. Students also learn preparation techniques for conducting long days in the field under varying weather conditions and in challenging terrains. The course may be repeated for credit when destination varies. There is a mandatory pre-departure meeting and trip length is typically one to two weeks in length. (YR). (YR).

### **Restriction(s):**

Can enroll if Class is Graduate

## ESCI 578 Field Geology 3 Credit Hours

Introduction to geological field methods; detailed rock descriptions, how 3-dimensional structures are visualized, described, and how maps and cross sections are constructed from field data. (F, AY).

### **Restriction(s):**

Can enroll if Class is Graduate

## ESCI 585 Spatial Analysis and GIS 3 Credit Hours

Application of the principles of Spatial Analysis and the use of Geographic Information Systems as a research tool in Environmental Science. Emphasis will be placed on the use of commercially available software including: ESRI's ArcView GIS, Golden Software's Surfer and Adobe PhotoShop. Emphasis will also be placed on the use of the Michigan spatial data warehouse program and the Michigan geographic framework program for metadata specific to Michigan. (AY).

### **Restriction(s):**

Can enroll if Class is Graduate

## ESCI 595 Topics in Environmentl Science 3 Credit Hours

Problems or readings on specific topics or subjects in environmental science. (YR)

### **Restriction(s):**

Can enroll if Class is Senior or Graduate

Can enroll if College is Arts, Sciences, and Letters

## ESCI 595G Topics in Environmental Sci 3 Credit Hours

Topic: Soil in the Environment. A study of the textural and chemical classification of soil as well as the biologic, engineering and geologic aspects of soil science including applications to agriculture and agronomic science. The course will explore topics such as soil formation, soil-water statics and dynamics, soil-energy balances, soil fertility and plant nutrition, biodiversity, soil and water management, soil pollution and remediation.

## ESCI 597 Off-Campus Independent Study 1 to 3 Credit Hours

Provides opportunity for qualified graduate students in the MSES program to pursue independent research under the direction of a graduate faculty member off campus. A written proposal describing the project (including the nature of the project itself, dates, where the project will be done and the faculty member supervising the project) must be approved by the MSES program director/committee before the student can register for the course. Project must be appropriate to the student's chosen track. It must be designed to produce a scholarly paper, papers, or other evidence(s) that reflect significant results from the course (F, W, S).

### **Restriction(s):**

Can enroll if Class is Graduate

**ESCI 599 On-Campus Independent Study 1 to 3 Credit Hours**

Provides opportunity for qualified graduate students in the MSES program to pursue independent research under the direction of a graduate faculty member. A written proposal describing the project (including the nature of the project itself, dates, and the supervising faculty member) must be submitted to the Program Director/committee for approval before the student can register for the course. Project must be appropriate to the student's chosen track. It must be designed to produce a scholarly paper, papers, or other evidence(s) that reflect significant results from the course. (F, W, S).

**Restriction(s):**

Can enroll if Class is Graduate

**ESCI 698 MSES Master's Project 3 Credit Hours**

Intended for students who present a plan for a project using methods of intellectual exploration and analysis. Possible projects include gathering data through laboratory or field based studies, using interviews and survey instruments to gauge human responses. They should involve creative representations, writing, and other forms of interdisciplinary analysis. To be carried out under the general supervision of a member of the graduate faculty in Natural Sciences. Project plan must be approved by the MSES Program Director/committee before student registers for this course. (F, W, S).

**Restriction(s):**

Can enroll if Class is Graduate

**ESCI 699 MSES Master's Thesis 1 to 6 Credit Hours**

MSES students electing this thesis option in the last stage of the program will work under the general supervision of a member of the graduate faculty in Natural Sciences, but will plan and carry out the work independently. Prospectus and thesis plan must be approved by the MSES Program Director/committee before student registers for this course. (F, W, S).

**Restriction(s):**

Can enroll if Class is Graduate

\*An asterisk denotes that a course may be taken concurrently.

Frequency of Offering

The following abbreviations are used to denote the frequency of offering: (F) fall term; (W) winter term; (S) summer term; (F, W) fall and winter terms; (YR) once a year; (AY) alternating years; (OC) offered occasionally