

# ESP 801: Physical, Chemical and Biological Processes of the Environment



**Time:** Monday, Wednesday, Friday 12:40pm – 1:30pm

**Location:** 115 Berkey Hall

**Course description (from the Registrar's website):** Interdisciplinary concepts in the natural sciences related to environmental problems. Ecology and human health.

**New in 2016:** ESP801 “Physical, Chemical, and Biological Processes of the Environment” has been redesigned to provide students who have disciplinary training in social sciences with a broad overview of environmental science from the perspective of natural sciences and engineering. ESP801 will include four modules: Environmental Geosciences, Biology/Ecology, Environmental Chemistry, and Environmental Engineering that will be taught by four MSU instructors (see below). An environmental case study will be adapted as a crosscutting theme for the course and a common point of reference for learning in ESP801 and ESP802. As a counterpart course to ESP801, ESP802 will also be structured in a modular fashion but will focus on social aspects of environmental problems. ESP801 and ESP802 will build a foundation for an integrative experience in the capstone ESP804 course where students, having taken ESP801 or ESP 802, work on team-based projects that span the social/natural science spectrum. The new curriculum design reflects ESPP's objective of providing an interdisciplinary preparation to a cohort of students from diverse background pursuing an interest in environmental science and policy.

**Coordinating Instructor:** Dr. Vlad Tarabara (Department of Civil and Environmental Engineering, Environmental Science and Policy program). Dr. Tarabara's research is in the area of membrane separation processes and their applications to water quality control.

## Module 1: Environmental Chemistry

**Instructor:** Dr. Hui Li (Department of Plant, Soil and Microbial Sciences). Dr. Li's research focuses on fate, transport and impact of organic contaminants, pesticides and pharmaceuticals in natural and engineered environments.

## Module 2: Biology/Ecology

**Instructor:** Dr. Daniel Kramer (James Madison College, Department of Fisheries and Wildlife). Dr. Kramer's research adopts a coupled human and natural systems approach to the conservation of biodiversity.

## Module 3: Environmental Geosciences

**Instructor:** Dr. Anthony Kendall (Department of Geological Sciences). Dr. Kendall develops and applies models and field methods to understand the landscape hydrologic cycle, and how humans impact water quantity and quality through land use and climate change.

## Module 4: Environmental Engineering

**Instructor:** Dr. Wei Liao (Department of Biosystems and Agricultural Engineering). Dr. Liao works on developing sustainable solutions to utilize organic wastes for value-added chemical and fuel production.

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