ENVIRNMNTL SCI & POLICY (ESP)

ESP 5070 Decision Making in Natural Resource Management (3)
Managing natural resources for multiple objectives, in a sustainable manner, is a challenge that both practitioners and researchers face in today's highly complex socio-political environment. Decision analysis skills are highly valued in the field of environmental science. This course will present current theories and applications related to decision making for natural resource management. Students will have the chance to work through local and regional decision making scenarios and compare different tools and theories on the ground.

ESP 5320 Watershed Hydrology (3)
This course will provide a qualitative and quantitative understanding of concepts and physical principles governing the occurrence, distribution, and circulation of water near the Earth's surface. Emphasis will be on the physical understanding and parameterization of hydrologic processes such as how rainfall and snowmelt become streamflow, evapotranspiration, and groundwater. This course is expected to serve as prerequisite to Watershed Management and Snow Hydrology, and co- or pre-requisite to Field Methods in Water Resources.

ESP 5500 Special Topics in Environmental Science and Policy (1-4)
An in-depth study of a particular topic, contemporary issue or concern. The course will be taught by a specialist within the field being studied or, as an alternative methodology, a faculty member will coordinate a series of guest speakers who will meaningfully address the topic. Since topics vary, the course may be repeated with permission of the instructor.

ESP 5530 Science-Based Research Design and Data Visualization (3)
This course will focus on data analysis techniques in environmental science. Topics will include exploratory analysis, research design, univariate and multivariate statistical approaches, a few basic machine learning algorithms, and Monte Carlo propagation of uncertainty. The course is project based, so students will work with a large data set of their choice throughout the semester.

ESP 5580 Climate Change (3)
This combined lecture and discussion course examines Earth's climate system and the feedbacks that affect it over annual to millennial (thousands of years) timescales. It is a highly interdisciplinary course that integrates information on climate from atmospheric, oceanographic and geologic sciences, and broadens overall comprehension of natural and human-invoked changes in earth's critical zone systems. Students from meteorology, environmental science and policy, and ecology should find this course highly informative and useful. Topics include past and present records of climate change, the various fields of study that contribute to climate knowledge, the effects of scale and frequency on the quality and reliability of climate records, and the state-of-the-art in climate assessment and prediction. Lecture sessions will provide fundamental information, especially with regard to the scientific basis for our current understanding of climate, and will introduce "hot" topics for discussion. Discussion sessions will focus on the most-recent status of these "hot" topics using recently published scientific papers and also online professional-level discussion forums. The role of science in politics and society will be an integral part of many of these discussions, including the obstacles created by declining public proficiencies in science and math and varying perceptions of risk.

ESP 5900 Master's Thesis Research (1-6)
Students select a topic in consultation with their advisor and committee. A timeline, proposal, and defense are outlined. A final thesis is prepared in accordance with program thesis guidelines. Pass/No Pass.