

ENVIRONMENTAL SCIENCE (EVRN)

EVRN 131 Introduction to GIS and GPS 3 Credit Hours (2,3)

This course develops foundational knowledge and skills in (1) cartography (the science and art of map making); (2) remote sensing; (3) geographic information systems (GIS) and the many applications of GIS in diverse professional and academic fields; and (4) the theory and operation of GPS receivers and data integration with GIS.

Prerequisite(s): None

EVRN 211 Field Data Methods 1 Credit Hour

A field intensive course including hands-on projects to delineate spatial boundaries based on geographic, topographic, and/or ecological constructs (e.g. wetlands) to support decision-making with regards to conservation, mitigation, land use, or restoration. (0,1) 1 Full Semester (0,2) 1 7 Week Session

Prerequisite(s): BIOL132 and EVRN131

EVRN 225 Intermediate GIS 3 Credit Hours (2,3)

This course includes design, implementation, and use of geographic information systems (GIS) for a variety of practical applications and research topics. Emphasis will be on geodatabases, georeferencing, geocoding, and geoprocessing, as well as providing an introduction to advanced topics using ESRI's suite of geospatial applications.

Prerequisite(s): EVRN131

EVRN 290 Ind St: Environmental Science 1-4 Credit Hours (1-4,0)

Special studies and/or research in environmental science for individuals or small seminar groups. Course content to be arranged by student(s) and a supervising professor with approval of school dean. Independent study courses may be repeated for a maximum of eight credits. Additional information is available at the School of Science and Natural Resources.

Prerequisite(s): Students must have an overall GPA of at least 2.5, and no I (incomplete) grades on their transcript

EVRN 311 Environmental Law 3 Credit Hours (3,0)

Study of the fundamental concepts of environmental law and ethics. Course includes a survey of the field of environmental ethics and a discussion of ethical issues, a review of the basic legal systems and research techniques, state and federal environmental statutes and codes of conduct for environmental professionals. Extensive use of case studies related to application of environmental law are used to illustrate ethical dilemmas and the approaches for resolving them.

Prerequisite(s): Junior standing

EVRN 315 Human Impacts on Environment 4 Credit Hours (3,3)

A study of human impacts on the environment, with an emphasis on global sustainability issues including impact from technology, population growth, agricultural and land use, climate change, chemical use and pollution, and energy systems. The laboratory will focus on developing skills in modeling, site assessment, and resource management.

Prerequisite(s): NSCI103, ENGL111, and one semester of college chemistry

EVRN 317 Environmental Health Apps 4 Credit Hours (3,3)

A systems approach addressing the factors that contribute to illness, injury, or death, and that affect the health status of individuals and populations. Topics include: environments within buildings, food sanitation, recreation facilities, personal services, and community noise and control. The laboratory emphasizes methods of measuring and evaluating environmental health risks as well as field experience.

Prerequisite(s): One semester of chemistry and NSCI103 or permission of instructor

EVRN 325 Geospatial Analysis 3 Credit Hours (2,3)

This course utilizes visualization of spatial data with GIS-based methods to analyze the data's distribution in space and/or time. Key topics will include the properties and quality of spatial data from land based and remote sensing sources, and the conceptual framework of spatial analysis. Project-centric lab exercises will include a variety of geospatial application such as the analysis of land use/land cover change, digital elevation model (DEM) analysis for terrain, watershed and flow, spatial interpolation, site suitability analysis, and spatial modeling through public and/or private sector applications.

Prerequisite(s): EVRN225

EVRN 341 Fate & Transport Environment 4 Credit Hours (3,3)

A study of the fate and transport of chemicals in the hydrosphere, atmosphere, lithosphere, and biosphere, and the modern analytical techniques utilized by environmental chemists. The laboratory component is project based and will utilize modern analytical instrumentation and modeling approaches.

Prerequisite(s): CHEM116

EVRN 355 GIS Programming & Applications 4 Credit Hours (3,3)

Spatial models and Python scripts are used to extend the functionality of GIS, and to automate and document spatial analysis and data management processes. Core topics include creating and running models in a GIS environment, converting and modifying model scripts, and developing Python scripts to process, map and analyze spatial data.

Prerequisite(s): EVRN225 and CSC1105 or by permission of instructor

EVRN 365 App Geospatial Technologies 4 Credit Hours (3,3)

This course focuses on contemporary and emerging trends in field-based geospatial technologies such as using unmanned aerial vehicles (e.g. drones), land survey equipment, and advanced GPS for data collection. Course content will evolve to reflect the current state of technologies in geospatial data acquisition, processing, and delivery.

Prerequisite(s): EVRN225

EVRN 389 Environmental Research Methods 3 Credit Hours (1,5)

A variety of sampling techniques and laboratory methods are introduced as they relate to the environmental sciences. These methods include sampling, preservation, and analysis of biotic (plankton, fish, benthic invertebrates, DNA, pathogens) and abiotic (water quality, sediments, soil, climate) data. Topics include representative sampling, trace inorganic and organic methods, calibration, selection of analytical methods, QA/QC, data analysis, and cost comparison. This course requires travel over spring break.

Prerequisite(s): CHEM108 and CHEM109 or CHEM116; either NSCI103, NSCI116, NRES286 or NRES345; and either MATH207, BUSN211 or BIOL280

EVRN 399 Internship Environmental Science 1-4 Credit Hours

This course is designed to provide students with an opportunity to earn credit while obtaining meaningful discipline-related work experience outside the classroom setting. Students are expected to spend a minimum of 45 hours in an approved work setting for each credit hour earned. Work hours and activities must be documented daily and approved by both the on-site supervisor and the instructor to receive credit. The course may be repeated for a maximum of four credits. 1-4

Prerequisite(s): 2.5 GPA in major, Junior standing and permission of chair at least one semester in advance of registering for the course

EVRN 435 Environmental Systems 3 Credit Hours (3,0)

A systems approach addressing engineered systems and their environmental impacts in modern society. Students will describe and analyze the causes and consequences of air pollution and air pollution control, water pollution and water pollution control (point source and nonpoint source controls), waste treatment, wastewater treatment, drinking water treatment, soil remediation, modern landfills, and design criteria.

Prerequisite(s): MATH111, CHEM115, and NSCI103

EVRN 445 Remote Sensing & Spatial Stats 4 Credit Hours (3,3)

Remote sensing skills such as ortho-rectification, color balancing, tiling imagery, and automatic feature recognition will be used to analyze spatial data such as aerial photography, hyperspectral imagery, multi-spectral imagery, LiDAR, microwave, and RADAR. Spatial statistics focuses on analyzing patterns, mapping clusters, and identifying geographic distributions using point pattern analysis spatial autocorrelation, spatial regression and kriging.

Prerequisite(s): EVRN325

EVRN 450 Laboratory Apprenticeship 1 Credit Hour

Students will assist in laboratories, learning instructional techniques, under direction of faculty. Course may be repeated for a maximum of two credits. Students must gain approval of the faculty member in charge of the specific laboratory, and the school dean. Credits may be used as EVRN electives. This is a credit/no credit course. (0,3) 1-2 per credit

EVRN 490 Ind St: Environmental Science 1-4 Credit Hours (1-4,0)

Special studies and/or research in environmental science for individuals or small seminar groups. Course content to be arranged by student(s) and a supervising professor with approval of school dean. Independent study courses may be repeated for a maximum of eight credits. Additional information is available at the School of Science and Natural Resources office.

Prerequisite(s): Student must have junior or senior standing, have an overall GPA of at least 2.5, and no I (incomplete) grades on their transcript

EVRN 495 Senior Project 2 Credit Hours (0,6)

This is a practicum course in which students, under the guidance of a faculty mentor, conduct a scholarly project mutually agreed upon by the student and his/her faculty mentor. This course will be required for a degree certified by the American Chemical Society. This course may not be repeated for credit. Dual listed as CHEM495.

Prerequisite(s): EVRN395 (also listed as CHEM395), and permission of instructor