

Geospatial and Environmental Informatics - GSEI

Courses

GSEI 1200 INTRODUCTION TO GEOSPATIAL TECHNOLOGY (3) LEC. 2. LAB. 2. Introduction to geospatial technologies, spatial thinking, and job markets in these areas. Exploration of location-based services, global positioning systems, geographic information systems, remote sensing, virtual globes, and web based mapping. Skills and techniques for spatial thinking and environmental analysis.

GSEI 2070 INTRODUCTION TO ENVIRONMENTAL INFORMATICS (3) LEC. 2. LAB. 2. Pr. GSEI 1200. Introduction to the environment as a system of linked, interactive components. Application of information science to environmental management. Skills and techniques required for collecting, collating, archiving, modeling, analyzing, visualizing, and communicating information in support of natural resource management.

GSEI 5150 SPATIAL STATISTICS FOR NATURAL RESOURCES (3) LEC. 3. Pr. (GSEI 1200 or GSEI 2070) and (WILD 5750). Applications of spatial statistics in natural resources. Introduction of basic concepts, theories, and methodologies of spatial and spatio-temporal data analyses and modeling. Topics include spatial correlation, spatial interpolation, detection of clusters/hotspots/patterns of interest, and spatial prediction.

GSEI 5360 ENVIRONMENTAL MODELING (3) LEC. 2. LAB. 1. Pr. FORY 5470 and FORY 5480 and GSEI 1200. Students will build models of environmental systems such as ecological, climatic, hydrologic, geochemical, and human systems, explore the basic concepts of systems modeling, and use models to test hypotheses and assumptions, evaluate system behavior, and predict changes in system behavior under different climate scenarios.

GSEI 5430 APPLICATIONS IN ENVIRONMENTAL INFORMATICS (3) LEC. 2. LAB. 1. Pr. GSEI 1200 and FORY 5470. This course emphasizes applications of earth observations to forestry, wildlife, environment and natural resources and covers both the technology and application of observing earth from space as well data acquired from airborne platforms.

GSEI 5800 PYTHON PROGRAMMING FOR THE ENVIRONMENT (4) LEC. 3. LAB. 2. Fundamental conceptual, methodological, and operational issues in Python programming with respect to environmental applications. Topics include Python programming concepts, scripting, and skills; data processing and management; data manipulation, visualization, and analysis; and connection to spatial data analysis.

GSEI 6150 SPATIAL STATISTICS FOR NATURAL RESOURCES (3) LAB. 3. Applications of spatial statistics in natural resources. Introduction of basic concepts, theories, and methodologies of spatial and spatio-temporal data analyses and modeling. Topics include spatial correlation, spatial interpolation, detection of clusters/hotspots/patterns of interest, and and spatial prediction.

GSEI 6360 ENVIRONMENTAL MODELING (3) LEC. 2. LAB. 1. Students will build models of environmental systems such as ecological, climatic, hydrologic, geochemical, and human systems, explore the basic concepts of systems modeling, and use models to test hypotheses and assumptions, evaluate system behavior, and predict changes in system behavior under different climate scenarios.

GSEI 6430 APPLICATIONS ENVIRONMENTAL INFORMATICS (3) LEC. 2. LAB. 1. This course emphasizes applications of earth observations to forestry, wildlife, environment and natural resources and covers both the technology and application of observing earth from space as well data acquired from airborne platforms.

GSEI 6800 PYTHON PROGRAMMING FOR THE ENVIRONMENT (4) LEC. 3. LAB. 2. Fundamental conceptual, methodological, and operational issues in Python programming with respect to environmental applications. Topics include Python programming concepts, scripting, and skills; data processing and management; data manipulation, visualization, and analysis; and connection to spatial data analysis.

GSEI 7200 LAND PROCESSES AND CLIMATE INTERACTIONS (3) LEC. 2. LAB. 2. This is an advanced graduate level course designed to teach the modeling of land surface processes and study its impact on local, regional and global climate. Students will also perform global/regional climate model simulations using supercomputers.

GSEI 7500 DIGITAL EARTH AND BIG DATA (3) LEC. 2. LAB. 2. This is an advanced graduate-level course designed to teach the modeling of digital earth and study its impact on local, regional and global climate. Students will also perform global/regional geographic model simulations using supercomputers.

GSEI 7600 CLIMATE MODELING (3) LEC. 2. LAB. 2. Teaches modeling of the Earth's climate system. Students will also perform global climate model simulations using supercomputers, and analyze climate model outputs using NCAR Command Language.