

Water-Related Graduate Coursework at ECU

BIOLOGY

5220, 5221. Limnology (4,0)

3 lectures and 1 3-hour lab per week. P: BIOL 2250, 2251; or consent of instructor.

Physical, chemical, and biological factors of inland waters and their influence on aquatic organisms.

5400. Wetland Ecology and Management (3)

P: BIOL 2250, 2251; or consent of instructor. Marshes, swamps, bogs, fens, and other intermittently flooded ecosystems. Emphasis on classification, ecosystem processes, structure, and management of freshwater and saltwater wetlands.

5401. Wetland Ecology Laboratory (1)

P: BIOL 2250, 2251; C: BIOL 5400. Application of methods to measure ecological properties, assess the functioning, identify plant communities, and understand landscape interaction of wetland ecosystems.

5750, 5751. Introduction to Regional Field Ecology (2,0) (5750:WI)

For science and environmental studies teachers. 20 hours of lecture and 32 hours of field trips. May not count toward MS in BIOL or molecular biology/biotechnology. Major regional ecosystems.

COASTAL AND MARINE STUDIES

5000. Scientific Diving and Underwater Research Techniques (5)

4 lecture and 2 lab hours per week. P: Consent of instructor. Fundamentals of scientific diving, including the use of Nitrox, specialized diving equipment, emergency procedures, sampling techniques, and a review of basic scuba diving skills.

ECONOMICS

5170. Resources I (3)

P for undergraduate students: ECON 3144. Applies microeconomic analysis to study of allocation of natural resources.

ENVIRONMENTAL HEALTH

5010, 5011. Principles of Toxicology and Laboratory (3,1)

For EHST majors but other majors accepted. P: Senior or graduate standing; 8 s.h. of general chemistry; 6 s.h. of biology, including BIOL 2130; or consent of instructor.

Basics of toxicology such as physiological response and environmental sources as well as specifics of major toxins.

5020. Environmental Toxicology (3)

P: EHST 5010, 5011; or consent of instructor. Effect of anthropogenic and naturally occurring toxins on environment. Toxin sources, distribution, and bioaccumulation.

Covers pesticides, metals, solvents, radioactive isotopes, food additives, air pollutants, and natural plant/animal toxins.

5800, 5801. Solid and Hazardous Waste Management and Laboratory (3,0)

2 lecture and 2 lab hours per week. P: CHEM 1160, 1161 or consent of instructor.

Problems associated with collection, treatment, and disposal of municipal solid waste and hazardous wastes in the United States.

GEOGRAPHY

6210. Advanced Fluvial and Hydrological Processes (3)
Comprehensive examination of principles of surface water hydrology and fluvial geomorphology and their application to environmental problems.
6230. Earth Surface Processes on the Coastal Plain (3)
Detailed examination of the dominant geomorphic processes and sediment dynamics involved in the creation of landforms and the redistribution of sediments and contaminants in coastal plain environments. Emphasis on laboratory experimentation.
6270. Advanced Water Resources Management and Planning (3) Same as PLAN 6270
Advanced investigation of spatial and temporal characteristics of water. Consideration of hydrologic, engineering, economic, and institutional aspects of water management.
6420. Advanced Remote Sensing (3)
P: GEOG 3420 or consent of instructor. Interpretation of environmental phenomena recorded in digital data formats by remote sensing instruments. Advanced techniques of digital image processing for remotely sensed images.
6430. Advanced Geographic Information Systems (3)
P: GEOG 3430 or consent of instructor. Advanced topics.
6440. Spatial Analysis of Coastal Environments (3)
P: GEOG 3410 or equivalent. Applications of geographic information science to research in coastal environments.
6460. Advanced Digital Terrain Analysis (3)
P: GEOG 2410 or equivalent; or consent of instructor. Advanced investigation of digital topographic analyses that focuses on topographic data acquisition, development of digital elevation models, topographic analyses, and terrain visualization.
- 6491, 6492, 6493. Independent Study in Geographic Techniques (1,2,3)
May be repeated for maximum of 6 s.h. P: Consent of instructor. Analysis of specific problem in geographic techniques under direct supervision of graduate faculty member.
6510. Meteorological Measurement Systems (3)
2 lecture and 3 lab hours per week. Principles of meteorological instruments and measurement techniques; basic and advanced methods in data logging, processing, quality analysis and quality control; hands-on experience in labs, and practical training via independent field project.
6520. Atmosphere Turbulence (3)
Mechanisms and characterization of atmospheric turbulence in terms of fluid dynamics and mathematical methods. Modeling and measurement techniques in study of atmospheric turbulence.
6530. Advanced Micrometeorology (3)
Advanced measurement and modeling techniques and their use in micrometeorological research; estimation of exchange of momentum, mass and energy between Earth's surface and lowest atmosphere, and their representation in large-scale meteorological models.
6540. Advanced Coastal Storms (3)
Advanced dynamics, analysis, and forecasting of extratropical and tropical storms. History of storms in the Carolinas and current mitigation plans.
6550. Synoptic Meteorology and Forecasting (3) (S)

Analysis and forecasting of mid-latitude weather systems as characterized by large-scale dynamics. Includes advanced techniques of weather analysis, map interpretation, and satellite and radar analysis.

6560. Applied Urban Climatology (3) (F)

Impact of urbanization upon atmospheric processes, including energetic balance, precipitation, atmospheric circulation, and pollution.

6570. Advanced Hydrometeorology (3)

Theory of atmospheric processes related to surface hydrology. Measurement, prediction, and climate analysis techniques of hydrometeorological variables and associated weather and hydrologic events.

6580. Advanced Radar and Satellite Meteorology (3)

P: Consent of instructor. Theoretical basis for weather observations with radar and satellite instruments.

6590. Advanced Tropical Meteorology (3)

P: Consent of instructor. Tropical atmosphere as key component of global weather and climate and climate prediction.

GEOLOGICAL SCIENCES

5150. The Geologic Component of Environmental Science (3)

P: Introductory GEOL course or consent of instructor. Basic geologic knowledge and insights that support sound, rational, and science based environmental decisions and policies in regard to land and water use. Topics include pollution abatement, clean up, and prevention; resource extraction, use, and conservation; and hazardous geologic processes

5450. Introduction to Aqueous Geochemistry (3)

2 lectures and 1 3-hour lab per week. P: CHEM 1150, 1151, 1160, 1161; or equivalent. Application of chemical principles to study of elements at earth's surface; their transportation in aqueous solutions; and weathering, groundwater, and surface water chemistry, geochemical cycles, and distribution of stable isotopes.

5700, 5701. Geohydrology of Drainage Basins (3,0)

2 lectures and 1 3-hour lab per week. P: GEOL 1500, 1501; or consent of instructor. Drainage basin geology and hydrology. Emphasis on quantitative analysis, evaporation, streamflow, and hydrologic parameters of surface water and ground water basins.

5710, 5711. Ground Water Hydrology (3,0)

2 lectures and 1 3-hour lab per week. P: GEOL 1500, 1501; or consent of instructor. Origin, occurrence, movement, quality, regional analysis, and management of ground water. Interrelationship of ground and surface water. Lab emphasis on aquifer test data collection and interpretation.

6550, 6551. Principles of Geophysics (3,0)

2 lectures and 1 3-hour lab per week. P: GEOL 3300, 3301; PHYS 1250, 1260 or equivalent. Seismology, gravity, rock magnetism, and heat flow as applied to earth. Emphasis on relationships between large scale features of earth and their geophysical characteristics. Lab introduces geophysical instrumentation, data processing, and interpretation.

7600, 7601. Remote Sensing of Coastal Environments (4,0)

2 lectures and 1 lab per week. P: Consent of instructor. Application of optical remote sensing to examinations of material transport within and between coupled land – ocean systems. Introduces image processing and analysis, integration of field measurement technologies and algorithm development. Emphasis is on the use of remote sensing as a research and decision-making tool.

7710, 7711. Groundwater Modeling (4,0)

3 lectures and 1 3-hour lab per week. P: GEOL 5710, 5711; or consent of instructor. Principles and procedures for numerical modeling focusing on design and practical applications of groundwater models in hydrogeology.

7910. Sediment Transport and Depositional Processes (4)

P: GEOL 4010 or consent of instructor. Examines processes involved in transport and deposition of sediment. Focus on fundamental principles and how they apply to active processes, recent sediment, and environmental applications.

7920, 7921. Advanced Surface Water/Groundwater Hydrology (4,0)

P: GEOL 5710, 5711; or consent of instructor. Advanced hydrologic topics with emphasis on computer applications and modeling. Evaluates steady-state and nonsteady-state models and applied aspects of hydrology related to management of water resources.

7830. Principles of Biogeochemical Interactions (3) Formerly GEOL 6830

P: CHEM 1160. General introduction to life's effects on chemistry of Earth's surface. Examines interactions between atmosphere, land surface, and oceans. Stresses human impact on global environmental chemistry.

PLANNING

6003. Design For The Built Environment (3) (F)

Urban design theories, tools and determinants of urban form.

6270. Advanced Water Resources Management and Planning (3)

Same as GEOG 6270. Advanced investigation of spatial and temporal characteristics of water. Consideration of hydrologic, engineering, economic, and institutional aspects of water management.

RECREATION AND LEISURE STUDIES

5100. Aquatic Facility Management (3)

Operation, maintenance, and management of aquatic facilities used for recreation, exercise, therapy, competition, education programs, and other aquatic-related programs.