 ENVIRONMENTAL SCIENCE CERTIFICATE

Post-Baccalaureate Certificate
https://www.towson.edu/fcsm/departments/environsci/grad/sciencepbc/

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Certificate Requirements (18 units)

All students wishing to receive a certificate complete a minimum of 18 units of graduate work as follows: two core courses and additional electives, selected in consultation with an adviser, from one concentration. No more than three 500-level courses can be counted toward the certificate.

1. Collect and evaluate geological, chemical and ecological data associated with creating and resolving solutions to current (and local) environmental problems.
2. Interpret the legal framework that underlies environmental regulation as it applies to protecting human health and the environment.
3. Apply their knowledge of geological, chemical and ecological processes to environmental data collection, analysis and interpretation in order to propose viable solutions to complex multidisciplinary environmental issues.
4. Find, read and comprehend the primary scientific literature that relates to environmental issues and produce written documents using a scientific format.
5. Communicate clearly, both in writing and orally, to a wide audience (potential stakeholders) the scientific basis for environmental decisions that impact human health and the environment.

Courses

ENVS 601 TOPICS IN ENVIRONMENTAL GEOLOGY (4)
Geological concepts related to developed and developing areas; topics include earth materials, soils and soil formation, hydrological cycle, waste management; water management; geological issues in land-use decision making. Some field work might require weekend obligations. Prerequisite: admission into the graduate program in Environmental Science or consent of the instructor. Lab/Class fee will be assessed.

ENVS 602 ENVIRONMENTAL CHEMISTRY (4)
Principles of chemistry applied to environmental pollutants; physical-chemical processes controlling pollutant transport, fate and distribution; partitioning of water, soil and air as they relate to biotic systems. Some field work might require weekend obligations. Prerequisite: admission into the graduate program in Environmental Science or consent of the instructor. Lab/Class fee will be assessed.

ENVS 603 ENVIRONMENTAL LAW AND REGULATIONS (3)
Operation of the American legal system as it functions to control and remediate environmental problems; emphasis on the law and legal processes which govern environmental disputes; function of legal institutions in these disputes; role of regulations in environmental protection. Prerequisite: Admission into the graduate program in Environmental Science or consent of the instructor.

ENVS 604 ECOSYSTEM ECOLOGY (4)
Principles of ecosystem ecology; factors controlling ecosystem structure and function; energy balance and biogeochemical cycles. Emphasis on ecological impacts of human alterations and urbanized ecosystems. Development of student capacity for "systems thinking" via modeling in field and laboratory based investigative projects. Implications for environmental management from local to global scale. Some field work might require weekend obligations. Prerequisite: admission into the graduate program in Environmental Science or consent of the instructor. Lab/Class fee will be assessed.

ENVS 630 CONCEPTS OF ENVIRONMENTAL ENGINEERING (3)
Introduction to the principles and concepts of environmental engineering for non-engineers; review and discuss methods of assessment and design; modeling methods used; critical assessment of design and different design paradigms; problem solving approaches.

ENVS 635 WETLANDS IDENTIFICATION, CONSERVATION AND DELINEATION (4)
The ecological, chemical and physical principles of wetlands biology; characterization, description and mapping of wetland habitats. Wetlands regulations and their ecological basis including hydric soil field indicators, interrelationship of landscape, vegetation and soils. Use of topographic maps, aerial photography, National Wetland Inventory maps and simple survey techniques. Some field work might require weekend obligations. Prerequisite: Admission into the graduate program in Environmental Science or consent of the instructor.

ENVS 640 ECOTOXICOLOGY (3)
Fate, activity and dose-response relationships of organisms to environmental toxicants; their absorption, distribution, metabolism and excretion; evaluation of physical, chemical and biological factors that influence toxicity. Quantitative methods and models used in acute and chronic toxicity studies. Prerequisite: Admission into the graduate program in Environmental Science or consent of the instructor.

ENVS 646 FLUVIAL GEOMORPHOLOGY AND HYDROLOGY (4)
Hydrologic and morphologic characteristics of streams and valley floors; landscape evolution by stream erosion and deposition, rainfall runoff relationships. Field exercises include quantitative analysis of fluvial processes, channel forms, mapping, topographic surveying, report writing. Some field work might require weekend obligations. Prerequisite: Admission into the graduate program in Environmental Science or consent of the instructor.

ENVS 650 AQUEOUS GEOCHEMISTRY (4)
Application of thermodynamics, mass balance, systems science, and kinetics to understanding mineral-water-contaminant interactions in natural and impacted aquatic systems on a variety of spatial and temporal scales. Some field work might require weekend obligations. Prerequisite: Admission into the graduate program in Environmental Science or consent of the instructor.

ENVS 670 INDEPENDENT STUDY IN ENVIRONMENTAL SCIENCE (1-3)
Studies in selected content areas tailored to student needs. This course may be repeated for a total of 3 credits. Prerequisites: Consent of instructor and matriculation in the Environmental Science graduate program.

ENVS 680 SELECTED TOPICS IN ENVIRONMENTAL SCIENCE (1-4)
Topics in environmental science will be chosen. Course content and field exercises will be determined as to complement course offerings in environmental science. Some field work might require weekend obligations. Prerequisite: admission into the graduate program in Environmental Science or consent of the instructor.
ENVS 682 SELECTED TOPICS IN ENVIRONMENTAL SCIENCE (1-4)
Topics in environmental science will be chosen. Course content and field exercises will be determined as to complement course offerings in environmental science. Some field work might require weekend obligations. Prerequisite: Admission into the graduate program in Environmental Science or consent of the instructor.

ENVS 683 SELECTED TOPICS IN ENVIRONMENTAL SCIENCE (1-4)
Topics in environmental science will be chosen. Course content and field exercises will be determined as to complement course offerings in environmental science. Some field work might require weekend obligations. Prerequisite: Admission into the graduate program in Environmental Science or consent of the instructor.

ENVS 686 SELECTED TOPICS IN ENVIRONMENTAL SCIENCE (1-4)
Topics in environmental science will be chosen. Course content and field exercises will be determined as to complement course offerings in environmental science. Some field work might require weekend obligations. Prerequisite: Admission into the graduate program in Environmental Science or consent of the instructor.

ENVS 798 RESEARCH PRACTICUM (3)
An analytical position paper on an approved topic written under faculty supervision. Students are expected to demonstrate scientific literacy, communication skills, critical thinking, and critical analysis in the research practicum. This course cannot be repeated. Prerequisite: Admission to the Graduate Program in Environmental Science, completion of four core courses. Permit required.

ENVS 896 THESIS (1-6)
Thesis research. Graded S/U. Prerequisites: Completion of two core courses in the graduate program in Environmental Science and endorsement by at least one member of the graduate faculty willing to serve as research adviser.

ENVS 899 THESIS CONTINUUM (1)
Continuation of thesis research.