SCIENCE in SHORELINE MANAGEMENT (11:628:401, 3 credits)

Instructor
Professor Karl F. Nordstrom

Prerequisites
Juniors and seniors who have taken any earth science, bioscience or environmental science course will have sufficient background preparation. The course is designed to fulfill the requirement for a SEBS junior/senior colloquium course.

Course Description
This research-oriented course will be of interest to students in geography, geology, ecology and coastal sciences and in disciplines related to environmental management. Course material includes identification and discussion of the processes associated with conversion of shores by direct and indirect human actions and the resulting appearance, evolution and function of the coastal landscape. This information is then used to provide a basis for environmental debate and an approach to management of endangered living and non-living resources. Case studies are used to illustrate coastal management practices and the scientific, technical, and social constraints to the application of science to policy formulation. The focus of the course material is on beaches and dunes because human alterations to these features and the natural processes that shape them are so prevalent and visible in the coastal zone.

The first half of the course will be devoted to identifying the relationship between theoretical concepts and management needs through a combination of assigned readings, lectures and classroom discussions of environmental dilemmas. The second half of the course will be devoted to individual student research on an original project, culminating in a well-written term paper, thoroughly documented using original data and primary references.

Topics
Introduction to applied science in shoreline management
Physical processes
Problems on developed shores
Protection structures
Beach nourishment
Aeolian processes and dune management
Estuarine shores and wetlands
Conducting research for scientific applications

Course Learning Goals and Assessment
The Learning Goals for the Marine Science Program are posted on our website at http://marine.rutgers.edu/main/academics/undergraduate/program-description. The learning goals for this course apply to Program Learning Goal 1 (master the basic biological, chemical, physical, and geological principles of marine science), Goal 2 (analyze and interpret contemporary oceanographic datasets (especially your own)), Goal 3 (show evidence of scientific literacy, and to communicate the information effectively both orally and in writing),
Goal 4 (develop, conduct, and report on an applied research experience), and Goal 5 (evaluate contemporary global issues and the ethics of how the ocean’s resources are used).

Students completing this course will be able to:
Apply their knowledge of shoreline management problems to take an active role in making decisions
Analyze the complexity of these problems and their solutions
Assess the level of scientific understanding and constraints to the application of science
Improve their critical, analytical, and creative thinking
Write well and in a scientific style

These learning goals will be assessed on the basis of:
  - Weekly assignments (5%)
  - Mid-term take-home exam in term paper format (25%)
  - Working bibliography for term paper (5%)
  - Presentation of results of individual research – outline accompanying oral presentation (15%)
  - Term paper on an original research problem of personal interest in the format of a scientific article (50%)

Criteria for evaluating the mid-term and term paper are based on the following:
  - Critical and analytical thinking (25%)
  - Knowledge of important processes and relationship to landscape (25%)
  - Citing literature in context (25%)
  - Communicating effectively and writing well (25%)