

2008 Summer Ventures in Science and Mathematics Course Descriptions

The University of North Carolina Wilmington

Coastal Geology

Students in this course will conduct field and laboratory studies using geological techniques throughout the unique environment of the Atlantic coastline in the southeastern United States. Measurement and analysis of the materials and the geologic and environmental processes that form the diverse beaches, islands, lagoons, channels, and tidal creeks in New Hanover County will be utilized to examine specific questions, problems, or issues. Students will observe and discuss processes characteristic of barrier islands and inshore waters, while learning pertinent techniques such as air photo/map interpretation, surveying, profiling, sediment and water sample collection and analysis techniques, biological collecting techniques, and statistical analyses. Students will have latitude to create projects that fit their interests within the time frame of this program. Results and observation of the student investigation will be presented in a professional forum at the end of the program. Instructors: Dr. Michael Smith, Ms. Jessica Croson, Mr. Bryan Bishop.

Computer Applications in Physics

This course will involve electronic data acquisition and computer analysis of physical experiments. Research topics include mechanics, electricity and magnetism, thermodynamics, optics, sound, and properties of materials. Students will have access to modern data acquisition devices as well as computer-controlled instrumentation such as oscilloscopes, sound frequency analyzers, and digital multi-meters. Instructors: Dr. Gabriel Lugo, Mr. Gary Cavender.

Ecology of the Ocean Surf Zone

Students will explore the ecology of the ocean surf zone with an emphasis on defining its function as essential fish habitat. Field sampling of both nourished and unnourished beaches in southeastern North Carolina will permit investigation of the effects of beach nourishment on fish habitat function. Students will acquire a variety of research skills including seining, gillnetting, sediment analysis, topographic profiling, water quality analysis, benthic coring, taxonomic identification, dietary and proximate composition analysis, database management and statistical analyses. Students will also design and conduct original research projects to test their hypotheses regarding the ecological impacts of beach nourishment. Students will present their research findings in a final symposium. Instructors: Dr. Thomas E. Lankford, Mr. Steve Clark.

Mathematical Modeling

This course will be an introduction to the mathematical modeling of systems in nature. Electronic data acquisition and computer analysis of experiments may be incorporated. Specific topics shall include an introduction to mathematical model building, exploring simple hands-on and simulated experiments using microcomputers mathematical software. Students will have the opportunity to develop and analyze mathematical models of real world continuous and discrete processes. Instructors: Dr. Russ Herman, Mr. David Glasier.