

Southern Connecticut State University

Curriculum Related Project Proposal 2007-2008

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SUMMARY

We are currently revising the Marine Studies minor so that students can maximize their learning. We are changing it from a collection of loosely related classes housed in a variety of departments to a coherent, structured curriculum in which students learn to think scientifically, gain practice in doing scientific research, and contribute to their community by addressing relevant marine and coastal environmental issues.

A key element to this new curriculum is a proposed course on Marine Field and Laboratory Techniques (MAR 460). The purpose of this course is to provide students with an in-depth knowledge of, and competency with, state-of-the-art data acquisition technology and modern laboratory analytical instruments and techniques. The purpose of this course is two-fold. It will provide students with a suite of tools for doing significant marine scientific research and it will also provide them with skills that have currency in the contemporary job market. There are two instruments presently unavailable to us that would be *fundamental* in teaching students state-of-the-art research techniques and providing them with the capability to do the kinds of research necessary to address the range of current environmental problems on the Connecticut coastline and Long Island Sound. One is a Global Positioning System with sub-meter accuracy for mapping the spatial distribution of environmental data and for mapping the changes in those variables over time. The other is a special water sampling system that can extract seawater for heavy metal analysis from various depths. Our most significant research thrust, one in which many undergraduates have participated, is heavy metal pollution in coastal waterways. We presently have the capability to sample heavy metals in the sediments, but not heavy metals in transport in the water column.

NEEDS ASSESSMENT

The context of needs assessment is the program evaluation and revision process. It has become part of our philosophy that student learning is considerably enhanced when science is taught as an inquiry based enterprise with students doing hands-on science in which real-life problems are addressed. The role of this class is to provide students with

the tools to do meaningful work. Please note that while MAR460 *is* a new course which is being submitted to UCF this semester as part of the program revision, we are asking for funding to provide key capabilities and not for the normal activities associated with a new course preparation.

GOALS/EVALUATION/OUTCOMES

Our goals and to teach students the technology, to provide them will research skills, to give them experience doing meaningful research, and foster the ability to do think scientifically in framing research questions, deciding on methodologies, and in analyzing the data they collect. Assessment of these goals will occur in the context of the class in terms of various projects they will undertake using this equipment and the papers they generated from their results. Assessment will also take place in subsequent components of the revised minor. This includes coursework in which they develop individual research projects and in which they carry out the proposed research, and the presentation of research at professional meetings.

METHODOLOGY

- 1) Acquire instruments.
- 2) Field test equipment and develop mastery over its use.
- 3) Identify specific sites for using instruments for marine environmental data gathering the will be used to train students.
- 3) Initial Offering of MAR 460 in Spring 2008.
- 4) Teach use of technology and research protocols in class/lab sessions.
- 5) Give students hands-on experience at selected field locations on projects such as mapping and monitoring progressive “sudden marsh dieback”, beach erosion, and heavy metal contamination of coastal waters and sediments.
- 6) Require students to write scientific reports based on their results that include discussion of the methodologies used, including their limitations, the analysis of their results, and implications for the community.

BUDGET JUSTIFICATION

<u>Item</u>	<u>Rationale</u>	<u>Amount</u>
Dr. Tait’s Budget		
MobileMapper GPS	Mapping Environmental Variables and Monitoring Change Over Time	\$2416.00
Dr. Breslin’s Budget		
Kemmerer Water Sampling System	Sampling Water Column Trace Metals	\$ 504.00
		<u>Total:</u> \$ 2920.00

TIMELINE

Acquisition of instruments, field-testing, and selection of study sites and projects completed by August 30, 2007.

MAR 460 offered in Spring 2008.

JOINT PROJECT

MAR 460 will be co-taught by Drs. Tait and Breslin. Dr. Tait will be responsible for the GPS system including field testing, teaching the technology, definitions of projects, selection of study site and review of student papers. Dr. Breslin will be responsible for heavy metal sampling technology and subsequent laboratory analysis by students.