

Instructionally Related Activities Funds Request Spring 2016

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IRA Funds Request for Marine Sensors and Technology on SRIRS

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Instructionally Related Activities Funds Request Summary

Project Sponsor	Geoffrey Dilly
Activity Title	Marine Sensors and Technology on SRIRS
Activity/Event Date	April 2016
Date Funding Needed By	Spring 2016
Previously Funded?	No
Semester/Year	—
Proposal #	—
Report submitted for previously Funded Activity?	—
Report submitted for previously Funded Activity	—
Additional Report #1	—
Additional Report #2	—
Additional Report #3	—
Additional Proposers	AJ Bieszczad
Academic Program(s) / Center Name(s)	Biology Department, Computer Science Department
Estimated total Course Fee revenue	n/a
Amount Requested from IRA	3720
Estimated Number of Students Participating	10
Conditions and Considerations	Field Trip
Brief Activity Description	This IRA funds request addresses this need by bringing together students in biology and computer science to add marine sensors to the developing CI Rainbow network and encourage interdisciplinary learning through environmental technology. To understand an ecosystem, you must measure it continually. This is a guiding principle in ecology and it is especially relevant in light of a changing climate. To understand the averages

	<p>and variability of an ecosystem, it is imperative to take continual measurements and monitor changes closely. Accurate long term studies have been key to tracing the changing temperatures, CO2 levels, and pH of the ocean.</p> <p>The long-term goal of the CI Rainbow project under Dr. Bieszczad is to build sensory networks for environmental monitoring placed into a cloud-based database. Masters students and undergraduates have been collaborating to build a test-bed at University Park and have plans to deploy this network on Santa Rosa Island. While their focus has thus far been on terrestrial measurements, the Santa Rosa Island provides a great opportunity to extend the reach of this network below the ocean surface.</p> <p>The ultimate goal of this proposal is to train students to bridge the disciplines of technology and biology and have students deploy and connect a multi-sensor sonde probe on the island to collect valuable temperature, dissolved oxygen, salinity, and chlorophyll data. The data collected from this work will be made available globally to any interested researchers, educators, and general public.</p> <p>Over the course of the Spring semester, students will meet to learn about the sensor, connect it to the campus CI Rainbow network, and build a wireless connection system to bring to the Santa Rosa Research Station. Then, in April or May 2016, 10 students from the Biology and Computer Science departments will accompany myself (and likely Dr Bieszczad) to the SRI research station for a weekend. There we will deploy the EXO2 sensor and connect it to the wireless router the students built, becoming the first live sensor in the Santa Rosa CI Rainbow network.</p> <p>We are seeking funds to support student travel to and from the research station during this field experience, and to rent the sensor for a period of 1 month so that students will have time to become familiar with the sensor on campus before deploying it on the island.</p>
Learning Outcomes and Relation to IRA to Course Offerings	<p>This interdisciplinary project brings together junior and senior undergraduates in biology and computer science with masters students in computer science to learn about the environmental relevance and technological requirements of marine sensor monitoring. All undergraduates participating in this project will be enrolled in Biol 494, CS 494, or CS 499.</p> <p>Students who participate will:</p> <ul style="list-style-type: none"> - Recognize and understand the abiotic factors important to oceanography and climate change: temperature, pH, dissolved oxygen, etc. - Program and interface successfully with a CTD Sonde - a universally important tool in aquatic systems monitoring - Learn about sensor networks - Understand how the fields of technology and marine biology can interface - Utilize the data and skills to further future research projects, especially upcoming future sensor deployments - Gain an important interdisciplinary perspective towards science <p>This activity paves the way for future course work incorporating marine sensors, important to the fields of biology, computer science, chemistry, and ESRM among others.</p>
Description of Assessment Process	<p>This project will unfold over the course of the Spring 2016 semester. Final assessment will be in the form of a grade from their respective instructor in Biology or Computer Science. The students will be required to log their progress during the semester and hold regular cross-departmental meetings. Once the sensor is delivered in March 2016, students will be required to meet multiple times a week and take notes on the process of building and testing the wireless network as it interfaces with the EXO2 sonde on campus. The students will also make a public blog recording their progress. The field trip will require all students to travel to the island and participate in the deployment of and measurements taken by the sensor. This will be documented through video and photography. The culmination of this research and training project will be poster presentations by the students at the 2016 Sage undergraduate research conference at CSUCI.</p>
Activity Budget	SRIRS_Marine_Sensors_IRA_Expense.xlsx
CIA Budget	—
CIA Proposal	—
Course Syllabus	—
CIA Certification	—
Other Sources of Funding	There are currently no other sources of funding for this project.
Target Audience/Student Marketing	My intended audience for this project are upper-division undergraduate students in the Biology and Computer Science departments, as well as at least one Computer Science masters student. Many, if not all, of the students interested in participating in this interdisciplinary project have already been identified in both departments, but there will be further inquiry in fall 2015 by faculty members to identify students willing to commit for the spring semester for research and training.
Bring Benefit to Campus	The deployment of the marine sensors will take place on SRIRS, but the data will be available via cloud-stored databases accessible to the university and to the general public. This is primary goal of the CI Rainbow project. Furthermore, between the online blog and the SAGE conference for undergrads at the end of the year, the students involved in this project will have a chance to share their experience and their

	findings with the campus and the community at large.
Sustainability	The goal of marine sensor research centers around sustainability. Continually monitoring the environment accurately allows for predictive capabilities in the face of a changing climate. It establishes baseline readings and monitors any fluctuations in the environment due to natural processes as well as anthropogenic influence. Marine sensor deployment and remote sensing promotes both future sustainable research projects and environmental accountability.
Program Chair/Director	amy.denton
Dean	karen.carey
Acknowledgement	I acknowledge that I have reviewed and accepted the Conditions and Considerations herein. Please check off boxes as appropriate.

Program Chair/Director Approval

Approval	I approve the IRA Funds Request described on this page
Name	Amy Denton
Date/Time	10/2/2015 7:11:40 AM
Validation	myCI-signin-ST-3626

Dean Approval

Approval	I approve the IRA Funds Request described on this page
Name	Karen Carey
Date/Time	10/2/2015 7:54:31 AM
Validation	myCI-signin-X2-8638

IRA Committee Decision

Decision	—
Comments	—

Actions

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