TOPICS: MARINE SCIENCE (11:628:2**, 1.5 credits)

Instructors
Professor Josh Kohut
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Prerequisites
None

Course Materials
All assignments available through course website

Description
The world’s Ocean is critical to life on Earth. It is a source of oxygen, water, food and energy that sustains life. It influences our weather and regulates our climate. It is the primary transportation pathway for commerce between continents. It absorbs the environmental impact of our sprawling mega-cities. Scientists require a better and more detailed understanding of the Ocean to continue to unravel the complex dynamics of our Earth system. Political leaders worldwide require this knowledge to build sound policies that meet the needs of growing human populations on a planet with increasingly limited resources and a rapidly changing climate. Yet the Ocean is vast, often harsh, and largely unexplored. To better understand the Ocean, a new global generation of scientific explorers is needed.

The Rutgers University Center for Ocean Observing Leadership operates one of the world’s most advanced ocean observatories. Sustained spatial sampling of the coastal ocean is accomplished with a variety of new platforms and sensors that include: the local acquisition of satellite imagery from the international constellation of thermal infrared and ocean color sensors, a triple-nested multi-static HF radar network for surface current mapping and waves, a fleet of long-duration autonomous underwater gliders equipped with physical and optical sensors.

This seminar will introduce students to ocean technologies, the datasets they produce, and analysis techniques that will allow the students to tell their own science story. In small groups, students will identify research topics and spend the semester conducting and communicating their work.

Objectives
• Give students a basic understanding of the ocean research conducted in the Center for Ocean Observing Leadership.
• Give students knowledge of the scientific data collected by ocean observing technologies and its applications to the understanding of marine science.
• Give students an opportunity to participate in ongoing research projects conducted within the ocean observatory.
• Give students the opportunity to contribute to education and outreach activities.
The course is team taught in the fall and spring semesters by professors from the Center for Ocean Observing Leadership. Specific course topics depend on ongoing research activities and range from local studies of the Raritan Estuary to global studies of climate change in Antarctica. First-time students are organized into small project teams each led by an advanced Marine Science student. Team activities are coordinated during weekly class meetings with professors to accomplish each semester’s ocean observing goals. Past class projects have included flying an underwater robot (RU27) across the Atlantic for the first time, storms, Antarctic ecosystems, and developing a plan for circumnavigating the globe using underwater robots. The weekly class will meet throughout the semester for an entire 80 minute period. In addition, the students will be required to participate in one out of class group meeting (60 minutes) to complete weekly assignments.

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](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), Goal 3 (show evidence of scientific literacy, and communicate the information effectively both orally and in writing), Goal 4 (develop, conduct, and report on an applied research experience in marine science in collaboration with a scientific mentor), and Goal 5 (evaluate contemporary global issues and the ethics of how the ocean’s resources are used).

Evaluation and Grading

Each student group will be evaluated on their participation in class and with the group on specific out of class assignments. Students will discuss weekly goals and objectives during each class period. Students will also participate in out of class group meetings to complete weekly assignments. At the end of the semester each group will present their work and its relation to the ongoing lab research in a group scientific poster.