

OCN 633: BIOGEOCHEMICAL METHODS in OCEANOGRAPHY

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Classroom: MSB 307

Meeting Times: M,W: 12:30-13:20, F: 12:30-15:20

INTRODUCTION:

This course targets primarily entering graduate students in Oceanography, Geology and Geophysics, and advanced undergraduate students in Global Environmental Sciences (and other physical and life science majors). Students will be introduced to field and laboratory techniques commonly used by oceanographers from the various subdisciplines (biological, chemical, geological, and physical). The course is divided into two 50-minute periods during which the theoretical principles and applications are discussed in a classroom setting and one 3 hour hands-on laboratory session. Methods actively used in research laboratories within SOEST will be used to analyze a marine samples collected during a field trip in Kaneohe Bay.

Although the majority of the time in OCN 633 will be devoted to laboratory techniques, the beginning of the semester will focus on field techniques. A field trip in Kaneohe Bay will introduce students to simple navigation techniques, sample collection and automated data acquisition with profiling instruments. The coastal setting of Kaneohe Bay, host to fringing, patch and barrier reefs, as well as mangrove and estuarine ecosystems, provides students with an opportunity to conduct in-situ measurements as well as collect samples of water, sediment, and plankton. The samples will subsequently be subjected to laboratory analyses during the rest of the semester. Laboratory methods ranging from classical wet chemical methods (e.g., titrations), to highly sophisticated “state of the art” instrumental techniques.

OCN 633 is team-taught by various faculty members who actively carry out research in the broadly defined field of biogeochemistry. Each brings expertise from his/her area of specialization to this course. Presentations by the three main course instructors will be supplemented by guest lecturers. It is the hope of the course instructors that this class will provide students not only with an understanding of the theoretical basis for biogeochemical techniques used in oceanography, but will also introduce and familiarize them with resources at SOEST that may be of subsequent utility while conducting their own graduate research.

COURSE POLICY AND GRADING:

OCN 633 has no homework or exams. Students will be required to attend lectures and participate in all laboratories. If students know they will be unable to attend a particular lecture or laboratory session because of research cruises or previously planned field-work, or for medical reasons, the instructors need to be notified in advance in order to arrange for the students to make up the missed work. **Because it will not be possible to make up certain labs, it is critical that instructors know of potential/planned absences.**

Any student missing two or more labs will not be able to complete this course and will either obtain a failing grade (for unexcused absences) or an incomplete, depending on circumstances. Social occasions/activities and/or trips organized privately by the students during regular semester session that are **not directly related** to their course of study will constitute unexcused absences. Research cruises in which the student participates will be excused, but cruises of extended duration may preclude the student finishing the course and result in an incomplete. This will have to be made up in some future semester.

It is important for students to read lecture materials provided by the course instructors or TA before the relevant class meeting. Reading by the student of additional material obtained from other sources (e.g., biology, chemistry, oceanography textbooks) is also encouraged.

Grades for the course will be based upon the following:

1. A qualitative evaluation by the course instructors and TA with respect to class participation/performance in the lecture/lab (40%). This represents a substantial part of the overall grade, hence it is important that each student make a concerted effort to ensure that the course teaching staff are aware of his/her "performance level". Because the course enrollment is typically small (5-8 students) team participation and attitude are important components of this evaluation.
2. A 20-minute (powerpoint) class presentation on a relevant topic mutually agreed upon by the student and class instructor(s) (20%)
3. A final written comprehensive laboratory report. (40%)

Detailed requirements of the classroom presentation and the comprehensive laboratory report will be provided in class. Briefly, the objective of the classroom presentation is to have students research a topic of potential interest to biogeochemists/oceanographers that is not specifically covered in the course syllabus. Preferably, the presentation should cover a recent advance in the field.

The final comprehensive report will include individual chapters covering the weekly laboratory sessions and finish with synthesis chapter. The report will focus on methods

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applied to samples collected during the field trip in Kaneohe Bay. The final report is intended to be a hybrid between a typical individual lab report and a scientific paper describing results of a hypothesis-driven research project. Thus, the final laboratory report will deviate from what is commonly expected in most undergraduate laboratories. The report must include hypothesis statements, data presentation and statistical treatment/evaluation of the results as well as describe the overall biogeochemical and/or oceanographic significance of the data obtained. The report should not be a compendium of seemingly unrelated individual laboratory exercises and their results.