NREM 665--Coastal and Wetland Ecology and Management Course Justification

1. What is the course modification?

   This is a new course.

2. Why is the course being requested?

   This course is being requested because there is currently a tremendous demand for such a course from the M.S. and Ph.D. students in the NREM Department. In addition, this is an area of specialization for Dr. Bruland and the topic in which he earned a Ph.D. Dr. Bruland was hired to bring expertise in coastal management to the NREM Department and we look forward to seeing him develop a course in this area for our graduate students and advanced undergraduates to take. He is developing a research program in this area at UH Manoa there will be a positive feedback between this research and his teaching.

3. How will the content be organized?

   See attached syllabus for course outline and schedule.

4. What other courses at UHM closely parallel the proposed course and in what way will the later make a distinct contribution?

   There are no courses at UHM on the topic of coastal and wetland ecology and management. This is a shortcoming in the natural science course offerings for a larger, research-oriented, land-grant university. While CTAHR’s major focus is on terrestrial ecosystems, there is an increasing body of evidence that terrestrial ecosystems can have major effects on downstream coastal ecosystems. In fact, land-based threats such as sediments, nutrients, heavy metals, and agricultural chemicals comprise of one the major stressors to coastal ecosystems such as sea grass beds and coral reefs. Furthermore, wetlands provide a natural interface between terrestrial and coastal ecosystems and have shown to be effective at retaining sediments, nutrients, and transforming chemicals. Wetlands also provide nursery and spawning grounds for many different fish species. There is another undergraduate course at UH Manoa in Zoology, ZOOL 410, titled Corals and Coral Reefs, but there is probably less than 10% overlap between this course and the NREM 665 course proposed by Dr. Bruland. The NREM 665 course will provide a much needed linkage between the terrestrial-focused courses offered in CTAHR and NREM with the more marine-oriented courses offered from SOEST. Finally, this course will not only be attractive to NREM and CTAHR students, but will also attract students from departments such as SOEST, Geology and Geophysics, Geography, and Urban and Regional Planning thus bringing in additional funding to CTAHR.

5. Where does the course fit into current and future curriculum?

   If approved, NREM 665 will become an elective course for NREM M.S. and Ph.D. students. The graduate students in our department are increasingly interested in coastal ecology, policy, and management. While the focus of NREM will never be on fisheries or the marine
environment, there is a need to offer a wider range of courses instead of focusing entirely on terrestrial ecosystems. This course will be focused on wetland and coastal environments and will provide training to students that are increasingly interested in these types of issues. Furthermore, this final part of the course will focus on integrated watershed management and the ahupua’a concept, which are also seen as increasingly important in natural resource management in Hawai’i.

6. Why is the number of credits and level justified?

The course will be taught twice a week for 75 minutes which equates to 3 credit hours. There will be no prerequisites so as not to be exclusive. My desire is to include as many students as possible in the course. This will provide an opportunity for our NREM students, and those from other departments to gain a better appreciation of coastal and wetland ecology and management.

7. How will the course assist students to achieve the critical skills expected of CTAHR graduates?

Students will have an opportunity to improve their written communication skills on both the problem sets and exams. The problem sets will require short answer and essay questions in which students will have to write in a grammatically correct manner, with the appropriate terminology and scientific format. They will also have an opportunity to do this type of writing on the midterm and final exams.

Students will practice their oral communication skills during in-class discussions and small group problem-solving exercises. They will also have opportunities to learn to listen more effectively during the lectures.

Students will improve their analytical/problem solving skills as they complete the problem sets, and take the quizzes and exams. The problem sets will consist of using formulas and data to make calculations, balancing redox reactions, calculating water and nutrient budgets, and determining species richness and evenness. The students will also learn how to make sound management decisions and implement appropriate and cost-effective best management practices based on the best available data and information from these ecosystems.

Students will be encourage to pursue reading and questions outside of class, to learn how to be effective class participants and team members during in-class exercises, and to demonstrate time management and self direction in managing the readings, problem sets, and studying for quizzes and tests.

The classroom environment in this course will be one where respect, sensitivity, and teamwork are expected, encouraged, and rewarded.

Students will also gain an appreciation of the market and non-market values that are provided by wetlands, sea grass beds, and coral reefs. They will learn that the ecosystem services
provided by these types of ecosystems are among the most valuable of any ecosystem type on earth.

During the lectures and the field trip, as well as with the course readings, students will learn about job opportunities and skill sets needed for post-graduate employment in this field.

Students will also be presented with some of the ethical issues involving wetland, sea grass, and coral reef restoration, management, and policy.

Students will be required to use word processing, spreadsheet, and simple modeling and statistical packages to complete the problem sets.

Students will also gain a more global perspective as we will study wetland and coastal ecosystems from all the major continents except for Antarctica. We will look at how the stressors and threats to these types of ecosystems are similar and different in developed versus developing countries as well as in temperate versus tropical climates.

8. How will students be evaluated?

Students will be evaluated by their participation in class activities and their performance on problem sets, quizzes, a midterm exam, and a final. See the syllabus for more detailed information.

9. What are the minimum qualifications for teaching this course? Is a qualified instructor available?

The minimum qualifications for teaching this course would be a M.S. degree in some aspect of wetland or coastal ecology and management. Preferably it would be taught by an instructor with a Ph.D. in this area. A highly-qualified instructor, Dr. Greg Bruland (see his website: http://www.ctahr.hawaii.edu/brulandg/ for more information), is available and looking forward to the opportunity to teach this course.

10. How will the course be financed?

The course requires no additional departmental or college-wide funding.

11. Has the course been offered before? Is there a demand for it?

The course has not been offered before. There is a tremendous demand for such a course to be offered in NREM from our current M.S. and Ph.D. students. In addition, I think this course will attract students from SOEST, Geology, Geography, and the Urban and Regional Planning Departments.

12. Is the course cross-listed with another department?

No.