

Department: MARN

Course No.: 135

Credits: 3

Title: The Sea Around Us

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Content Area: CA 3 Science and Technology

Catalog Copy: MARN135. The Sea Around Us. Second semester. Three credits. The relationship of humans with the marine environment including the exploitation of marine resources, development and use of the coastal zone, and the impact of technology and pollution on marine ecosystems.

Course Information: The overall goal of this course is to educate students about science through an analysis of several environmental issues pertaining to human interaction with the marine environment. To achieve this goal, students need to gain an understanding of what science is and what it is not, including the ways scientific evidence and data distinguish credible science from undocumented ideas and opinions. Furthermore, the students will learn background information on a number of topics (for example: ecology – trophic relationships and biogeochemical cycling; coastal geology – waves action (including tsunamis) and sediment transport; climate - hurricanes and global heat/climate). The emphasis, however, is not on this background material itself, but its application and the relevance of scientific investigation to topics of environmental interest. This course is distinct from Introduction to Oceanography (MARN170/171) because of the focus on the interaction of humans and the marine environment, a minor part of MARN170/171.

Student exams (midterm and final) feature a mixture of multiple choice, fill in the blank, and short answer. There is a balance between simply remembering information and using that information to apply to questions not directly covered in class. Quizzes every 1-2 weeks encourage the students to keep up with what is presented in lecture. Some homework assignments are targeted at getting the students to think analytically both with and without numerical manipulation (units conversions and simple algebra). Other homework assignments encourage the students to obtain information on their own to contribute to class discussions on the major topics covered in class. There are only a few short writing assignments (no term paper), but students are expected to write coherently in their homework assignments and in answers to short answers (paragraph length) on exams. In addition to core reading assigned to the whole class (about 30 pages per week), each student is required to do additional reading in books and articles that have been screened by the instructor. Diverse material from these and other sources contribute to class discussion. This class participation is a non-trivial part of the student's final grade, in an attempt to help the students learn to educate themselves about topics.

The major themes covered in this class include:

- a. Pollution
- b. Eutrophication
- c. Invasive species
- d. Fisheries
- e. Aquaculture
- f. Coastal processes, hazards and development
- g. Habitat change
- h. Global climate/climate change

Meets Goals of Gen Ed: The broad subject matter included in MARN135 makes it a course that meets the goals of General Education in several ways. Class discussion and written assignments encourage the students to become articulate about the contemporary environmental issues included in the course. Background information, required for each subsection of the course, provides a broad foundation within an applied context. Practice in analysis of relevant topics stimulates a sharpened awareness of how humans impact and are impacted by the marine environment. As a science class focused on environmental topics, MARN135 also educates students to think critically, distinguishing conclusions based on scientific data and credible evidence, from conclusions based on subjective opinions, economics and/or self interest.

CA3 Criteria: 1. In order for the students to be able to think and discuss intelligently about environmental issues, this course includes basic information pertaining to chemical, geological, physical and biological processes that relate to the various issues, including: how ecosystems function; eutrophication; shoreline processes and hazards; global climate and global carbon budget. A broad range of disciplines in the natural sciences are represented by these topics, but they are coherent in that they all pertain to environmentally relevant issues that are covered by the course.

2. Part of the course is specifically devoted to understanding what science is and what science is not. Students' answers to questions for homework, quizzes, and exams are scrutinized to make sure they are based on documented science, not speculation or personal opinion. Additionally, the historical review of various environmental issues shows how scientific investigations and data can be applied. For each of the topics, specific attention is paid to the contribution of science to increased understanding and amelioration environmental damage.

3. The interplay of human activities and the marine environment brings up a number of unresolved scientific questions. The applied nature of these questions gives the students real life examples that are concrete rather than theoretical. These are good case studies for learning to appreciate the scientific approach towards gaining knowledge.

4. At its core, the curriculum for this course is designed to stimulate student interest and continued learning. The course is intended to provide students with both a good foundation of background knowledge and familiarity with information resources. The relevance of the environmental issues covered in the course will (hopefully) give the students a special

connection to these topics as they read and hear about them in the future. The theme of the marine environment is particularly appropriate to the students at the Avery Point campus.

Supplementary Information: The Department of Marine Sciences plans to offer two general education science classes, one of which has a laboratory option. Introduction to Oceanography (MARN 170 and 171) emphasizes the basics of the general field of Oceanography, including the geology, physics, chemistry and biology of the ocean. Due to the very broad nature of that course, only a minimal amount of time can be spent on how humans affect and are affected by the marine environment. The development of MARN135 as a general education offering at Avery Point will offer students at that campus a distinct choice in general education science classes offered by the Department of Marine Sciences. This is particularly relevant to the students majoring in Maritime Studies, for which MARN135 is presently listed as a required course.