Course objectives: The course explores the foundational science of coastal oceanography and ecosystem processes, and then considers ways in which science is applied to manage, restore, and conserve coastal marine resources. Major goals of the course are students (1) strengthening their understanding of marine science and writing skills by crafting short essays about contemporary coastal marine resources issues, and (2) articulating scientific principles and negotiating an equitable outcome for a coastal marine ecosystem conflict in a class debate. Achieving the two goals provides students an opportunity to further develop and apply their understanding of interdisciplinary coastal marine ecosystem science. These activities are also fun.

The course covers physical, chemical, geological, and biological oceanography, and ecological processes associated with coastal ocean ecosystems, continental shelves, kelp forests and rocky reefs, coral reefs, estuaries, polar environments, and sandy beaches. We will consider important human-resource interactions in the coastal marine environment and emphasize research relevant to resource management. Students will explore contemporary environmental issues associated with various topics, and generate discussion of those issues in class, as well as write about them.

Of course, this course will be live. There are no exams. All the necessary information is provided on Gauchospace.

Course work: Each student will complete weekly readings and write three 2-page popular newspaper or blog-style articles (with references) on topics related to material presented in lectures. The articles will cover the science and policy related to a contemporary problem facing marine resource management, climate change, conservation, or business. Students will select their own topics and submit their articles preferably every three weeks. Students will work with Prof. Lenihan to develop the ideas, plan and execute the writing, and edit the material. The goal is to write something good enough to be published in the LA Times, Santa Barbara Independent, a preferred blog, or another general science media outlet. It’s a great opportunity to improve your writing.

All students will also participate in a debate at the end of the quarter in which roles will be played that represent disparate sides and opinions of a major issue facing coastal marine resource management. Students will select roles to play, representing different stakeholder groups, prepare through reading the scientific literature and related reports, talking with experts, and integrating information from other Bren courses. Being well prepared will allow for a well-informed debate, the objective of which is to develop new ideas to help solve a major human-resource interaction conflict in the coastal ocean.

Course readings. All students should read course material assigned each week. The readings provide the basic information needed to understand how coastal marine systems function. They are the basis for the lectures normally given in this course.
Reading assignments come from: (1) **Ocean Circulation**. The Open University. (2) **Waves, Tides, and Shallow Water Processes**. (3) Selected Chapters from **Marine Community Ecology and Conservation** by M.R. Bertness et al. (eds.). 2014. (3) an assortment of scientific articles (to be posted on Gauchospace).

The assigned readings, and a few other key articles, will be provided in pdf form on Gauchospace. The readings are those that a Masters or PhD graduate student in Marine Sciences would read in part to obtain their degree, thus will provide you with a solid foundation for understanding Coastal Marine Ecosystem Processes.

**Grading:** Effort and mainly improvement in writing the articles, and preparation for and participation in the debate, are required for a passing grade. How well you do in each aspect merits the specific grade that you will receive.

**Class schedule and topics**

*Lectures in black ink; Field trips in red ink; vans required in red/bold text; class will travel by foot on other trips*

**Week 1: 29 March/31 March**
Tuesday  
Introduction and course objectives
Thursday  
Ocean circulation

*Reading: *Ocean Circulation, Chapters 1 and 2. Introduction, and the atmosphere and the ocean. 21 pages. Chapter 3, Ocean currents, pages 17-35 and 64-74.*

**Week 2: 5 April/7 April**
Tuesday  
CA current ecosystem
Thursday  
Santa Barbara Channel Ecosystem

*Reading: *Patterns and processes in the California Current System. Article by Checkley and Barth (2009). 16 pages.*

**Weeks 3: 12 April/14 April**
Tuesday  
Beach ecosystems-Field trip to local Isla Vista beach ecosystem
Thursday  
Estuary trip-Carpinteria Salt Marsh (Dr. Andy Brooks): 3 vans

*Weekly Reading: Waves, tides, and shallow water processes, Chapter 4, Principles and processes of sediment transport. 27 pages.*

**Weeks 4: 19 April/21 April**
Tuesday  
Beach communities (Dr. Jenny Dugan)
Thursday  
Estuaries and lagoons

*Weekly Reading: Waves, tides, and shallow water processes, Chapter 5, Beaches. 21 pages.*

**Week 5: 26 April/28 April**
Tuesday  
Ocean Rainforest-Eliza Harrison-Giant Kelp Hatchery: 3 vans
Thursday  
Dr. Dan Reed – kelp forest restoration
Reading: **Marine restoration ecology.** Chapter 22 (by S. Powers and K. Boyer) in Bertness et al. 2014. 18 pages

**Week 6: 3 May/5 May**
Tuesday  
Fisheries: ecosystem impacts
Thursday  
Chris Free – Lecture on fisheries MSEs.

Reading: **Threats to marine ecosystems.** Chapter 20 (by B. Worm and H.S. Lenihan) in Bertness et al. (2014). 26 pages.

**Week 7: 10 May/12 May**
Tuesday  
UCSB estuarine restoration site (Dr. Lisa Stratton): 3 vans
Thursday  
Mark Page- wetland restoration

Reading: **Salt march communities.** Chapter 11 (by M. Bertness and B. Silliman) in Bertness et al. (2014). 18 pages.

**Week 8: 17 May/19 May**
Tuesday  
Aquaculture
Thursday  
Bruce Steele’s farm-sustainable farming TBD

Reading: **Naylor et al. (2009).** Feeding aquaculture in an era of finite resources. PNAS 106: 15103-15110.

**Week 9: 24 May/26 May**
Tuesday  
Debate preparation
Thursday  
Marine pollution

Reading: **TBD**

**Week 10: 31 May/2 June**
Tuesday  
Class debate
Thursday  
Whale Research Cruise: 3 vans