

## SEMESTER AT SEA COURSE SYLLABUS

### Colorado State University, Academic Partner

<b>Voyage:</b>	Spring 23
<b>Discipline:</b>	Natural Resources
<b>Course Number and Title:</b>	NR 370 Coastal Environmental Ecology
<b>Division:</b>	Upper.
<b>Faculty Name:</b>	Ed Boyer
<b>Semester Credit Hours:</b>	3

**Prerequisites:** One (1) lower-division chemistry course

### COURSE DESCRIPTION

Human cultures and societies have been intimately connected with coastal environments since the dawn of humanity. Many of the great population centers in the world today are coastal and/or on the mouths of great rivers where they reach the sea. Coastal environments include beautiful sand beaches, rugged rocky coasts, mangrove estuaries and lagoons, fjords, deserts and ice sheets. Management of coastal zones is one of the more pressing environmental issues of the day due to the problems of expanding marine aquaculture, population growth and habitat destruction, beach erosion, resource extraction, rising sea levels and more. Problems of coastal zone management are complex involving scientific, economic, and political problem solving approaches. Issues of social justice and sustainability intersect with challenges of evaluating ecosystem services or the causes and effects of climate change. Taking advantage of the opportunities afforded by the SAS travel itinerary, we will be able to observe a broad range of different coastal environments as well as their socioeconomic and political contexts.

### LEARNING OBJECTIVES

- Develop a fundamental understanding of coastal and offshore marine areas by studying oceanic processes, both natural and man-made.
- Assess both the coastal zone and the pelagic environment to gain an appreciation of the inter-relationship between the two areas.
- Explore the effects of human activities such as fishing, aquaculture, land development, farming, and international commerce on the coastal environment, both at regional and global levels.
- To learn about the efforts of conservation agencies to prevent and correct the effects of coastal pollution and habitat disturbance and to examine how coastal areas should be best managed to balance human interest with natural processes.
- To assess the extent of global coastal changes (natural and human-caused) and their effects on coastlines.

## REQUIRED TEXTBOOKS AND MATERIALS

AUTHOR: K. Mann  
TITLE: Ecology of Coastal Waters  
PUBLISHER: Chapman and Hall  
ISBN: 978 1 444 30924-9  
DATE/EDITION: 2000; 2<sup>nd</sup> Edition

Students can access course material and required readings on the intranet.

Required material:

- a waterproof field lab book (Rite in the Rain)
- classroom lab journal
- pencils, colored pencils, eraser, sharpener
- pair of plastic gloves (puncture proof)
- 3-ring binder (2"), dividers.

## TOPICAL OUTLINE OF COURSE

### Embarkation Day – January 5

- 1: Introduction to course and each other;**  
Syllabus and Itinerary overview; Classroom Environment  
Looking at Maps;  
What you need to know to get started.  
What is Coastal Environmental Ecology - Definitions  
(READING = CH. 1)
- 2: Diversity of Coasts and the major issues and concerns**  
Being a field naturalist – observing and writing  
Field Notebooks vs Field Journal  
(READING = CH. 1)
- 3: Coastal/Near Shore and Open Ocean/Offshore linkages**  
Physical attributes; tides  
Kelp Forest Ecology  
(READING= CH.12)
- 4: Ecological Processes – Productivity; Energy flow;**  
Nutrient Cycling; Detritus; Eutrophication and Pollution  
(READING = CH. 10)
- 5: Coastal Upwelling Ecosystems**  
(READING = CH. 15)

- 6: Special Topic: Invasive Species and Marine Shipping**  
Review for Exam
- 7: EXAM #1**
- 8: Estuarine Ecosystems and Coastal Wetlands**  
Basic Estuarine Ecology;  
Special Topic: Mosquito control in Wetlands  
(READING = CH. 2)
- 9: Mangroves**  
Special Topic: Mangroves as coastal protection and effects of habitat alterations  
(READING = CH. 4)
- 10: Continental Shelf/Near Shore zones and Resources**  
Impacts of changes in river discharge  
(READING = CH. 17)
- 11: Diversity of Coastal Life: Plankton, Nekton and Benthon**  
(READING = CH. 14)
- 12: Sea Grass Communities**  
(READING = CH. 5)
- 13: Rocky Shore Intertidal Zones**  
Classic ecological studies  
(READING = CH. 11)
- 14: Subtidal Rocky shores and Algae**  
Special Topic: Keystone Species and Community Structure  
(READING = CH. 12)
- 15: Salt Marshes and Mudflats**  
(READING = CH. 3)
- 16: Coral Reefs; Biodiversity and Mutualism**  
Special Topic: Temperature Change and Coral Reef Health  
EXAM REVIEW  
(READING = CH. 16)
- 17: Exam #2**
- 18: Special Topic: Shelf Resources – Global Demand for Sand**
- 19: Beaches; Erosional and Depositional shorelines**  
(READING = CH. 13)

**20:** Ice ages, sea levels and coastal topography  
Effects of sea-level change on coastal zones

**21:** Law of the Sea and Exclusive Economic Zones  
Special Topic: Extractive resource use on continental shelves  
(READING = CH. 17,18)

**22:** Student Presentations

**23:** Student Presentations  
Exam review

**24:** FINAL EXAM

**25—FINAL CLASS:**  
WRAP UP  
Reflections on the course

**Disembarkation Day — April 20**

## **FIELD WORK**

Semester at Sea® field experiences allow for an unparalleled opportunity to compare, contrast, and synthesize the different cultures and countries encountered over the course of the voyage. In addition to the one field class, students will complete a Comparative Experiential Project that span multiple countries.

### **Field Class & Assignment**

**STUDENTS: Field Class proposals listed below are not finalized.** Confirmed ports, dates, and times will be posted to the [Spring 23 Courses and Field Class page](#) when available.

**Field Class attendance is mandatory for all students enrolled in this course. Do not book individual travel plans or a Semester at Sea sponsored trip on the day of your field class.**

Field Classes constitute 20% of the contact hours for each course.

Field Class Title: Wetland and Estuarine Ecology

#### Outcomes:

- Carefully observe coastal estuarine or delta environments and record those observations in field notes
- Gain understanding of the complexity and diversity of estuaries and their importance in providing ecosystem services
- Be able to identify key species of mangroves and other salt-tolerant plants, birds, and other marine life
- Understand how to assess the health of estuarine communities and note key threats to those areas and any ongoing or planned measures to counter those threats
- Understand the physical aspects of deltas and estuaries including tides, currents, salinity and temperature gradients

### Activities:

- Visit nearby conservation projects, aquaria, parks or reserves and/or visitor centers that focus on delta or estuary habitats
- Explore a mangrove estuary (sea grass bed or salt marsh) by boat, trekking by foot, and/or snorkeling to map and note channel topography and dominant species distributions
- Observe mangrove prop-root communities
- Practice field ID skills with species of mangrove and other halophytic plants
- Travel to protected areas to observe migratory and shore-bird diversity
- Examine impacts of aquaculture or other human uses on estuary health and function
- Meet with local authorities engaged in coastal wetland conservation projects

### Assessment:

- Participation in the field class
- Field notes and field journal write up
- Summary report about the field class visit including notes and reflections
- Due by SECOND CLASS MEETING AFTER PORT
- The field class will be worth 20% of the course grade

### **Comparative Experiential Project**

The CEP is the required comparative assignment that span multiple countries. The Comparative Experiential Project constitutes at least 5% of the grade for each course.

Students in groups will be assigned 2 pairs of ports-of-calls countries. Each pair of port countries will represent an oceanographic region such as temperate, subtropical, tropical, desert, open ocean, or enclosed gulf waters. Within each region 2 ports will be studied, allowing us to compare different regions as well as individual port countries. Basic geographic and oceanographic features of each port will be noted and students should also note anything they deem relevant to our course, which could include coastal erosion or development; made structures to combat tsunamis, sea level change etc.; seafood consumption and markets; aquaculture; fishing practices – just to name some examples. More detailed guidelines will be given on the first day of class.

Groups will prepare 5-minute power point presentations, including photos and sketches, and turn in a summary report. The students will be graded on their creativeness and ability to apply concepts we covered in class to their observations; quality of their essays and PPP.

### **METHODS OF EVALUATION**

20%	Field Class & Field Class Assignment
10%	Comparative Experiential Project
10%	Class Participation
20%	Midterm Exams
20%	Final Exam
10%	In Class group assignments
10%	Ship Voyage Log

## GRADING SCALE

The following Grading Scale is utilized for student evaluation. Pass/Fail is not an option for Semester at Sea® coursework. Note that C-, D+ and D- grades are also not assigned on Semester at Sea® in accordance with the grading system at Colorado State University (the academic partner institution).

Pluses and minuses are awarded as follows on a 100% scale:

<u>Excellent</u>	<u>Good</u>	<u>Satisfactory/Poor</u>	<u>Failing</u>
97-100%: A+	87-89%: B+	77-79%: C+	Less than 60%: F
93-96%: A	83-86%: B	70-76%: C	
90-92%: A-	80-82%: B-	60-69%: D	

## ATTENDANCE/ENGAGEMENT IN THE ACADEMIC PROGRAM

Attendance in all Semester at Sea® classes, including the Field Class, is mandatory. Students must inform their instructors prior to any unanticipated absence and take the initiative to make up missed work in a timely fashion. Instructors must make reasonable efforts to enable students to make up work which must be accomplished under the instructor's supervision (e.g., examinations, laboratories). In the event of a conflict in regard to this policy, individuals may appeal using established CSU procedures.

## CLASSROOM CLIMATE

Semester at Sea® is committed to the Voyage Community Values. Consequently, the classroom environment is founded on mutual respect, community, and an aim toward equity. The Voyage Community Values support the creation of a collaborative and vibrant community. Our community is the foundation of our learning, critical inquiry, and discovery. Each member of this course has a responsibility to uphold these values when engaging with one another.

With that, please review the following Voyage Community Values:

- **Well-Being:** We commit to the health, safety and well-being of ourselves, all members of our voyage community, *and* members of the communities we will visit.
- **Interconnectedness:** We understand our actions and attitudes have an impact locally and globally. We always seek to positively affect the planet and the people around us near and far.
- **Respect:** We honor the inherent dignity of *all people* with an abiding commitment to freedom of expression, scholarly discourse and the advancement of knowledge. We have the right to be treated, and the responsibility to treat others, with fairness and equity.
- **Inclusion:** We ensure inclusive environments that welcome, value, affirm and embrace *all people* within the shipboard community and in each country we visit.

- **Integrity:** We are honest and ethical in all of our interactions, including our academic work. We hold ourselves accountable for our actions.
- **Excellence:** We model the highest academic standards of preparation, inquiry and knowledge and consistently seek to understand complex issues and express informed opinions with courage and conviction.

## LEARNING ACCOMMODATIONS

Semester at Sea® provides academic accommodations for students with diagnosed learning disabilities, in accordance with ADA guidelines. Students who will need accommodations in a class, should contact ISE to discuss their individual needs. Any accommodation must be discussed in a timely manner prior to implementation.

A letter from students' home institutions verifying the accommodations received on their home campuses (dated within the last three years) is required before any accommodation is provided on the ship. Students must submit verification of accommodations to their Student Services advisor as soon as possible, but no later than two months prior to the voyage. More details can be found within the **Course Registration Packet**, posted to the student portal prior to registration.

## STUDENT CONDUCT CODE

The foundation of a university is truth and knowledge, each of which relies in a fundamental manner upon academic integrity and is diminished significantly by academic misconduct. Academic integrity is conceptualized as doing and taking credit for one's own work. A pervasive attitude promoting academic integrity enhances the sense of community and adds value to the educational process. All within the University are affected by the cooperative commitment to academic integrity. All Semester at Sea® courses adhere to this Academic Integrity Policy and Student Conduct Code.

Depending on the nature of the assignment or exam, the faculty member may require a written declaration of the following honor pledge: "I have not given, received, or used any unauthorized assistance on this exam/assignment."

## RESERVE BOOKS FOR THE LIBRARY

TBA

## FILMS

TBA

## ELECTRONIC COURSE MATERIALS

TBA