

SEMESTER AT SEA COURSE SYLLABUS

Colorado State University, Academic Partner

Voyage:	Fall 2018
Discipline:	Natural Resources
Course Number and Title:	NR 370 Coastal Environmental Ecology
Division:	Upper
Faculty Name:	Lindsay Young
Semester Credit Hours:	3

Meeting: A days, 1400-1520, Kaisersaal Starboard

Prerequisites: The standard CSU prerequisite of *one (1) fundamentals of chemistry course* has been waived by the instructor.

COURSE DESCRIPTION

Coastal ecosystems form the interface between the land and ocean and support more than half of the planet's human population as well as some of the most productive and diverse ecosystems on our planet. Human migration to coastal areas has increased rapidly in recent years as a result of the need for access to food (fishing grounds) and the high socio-economic and aesthetic value placed on these locations. Our residential and industrial wastes pollute beaches, agriculture causes fertilizer and sediment to run into the sea, aquaculture ponds and development replace wave-buffering mangrove forests, and harvesters deplete fish and shellfish stocks. Compounding these issues are the effects of climate change which are raising sea levels, altering the distributions of plants and animals, and modifying patterns of storms and precipitation. Balancing human use of coastal and marine areas with preserving and maintaining a healthy ecosystem is a daunting task. Semester at Sea offers an unparalleled opportunity to study and visit coastal ecosystems across the world to learn about and understand the scope of these issues. This interdisciplinary course will combine the study of the nearshore ecosystems of our oceans with human activity and will focus on how countries and the international community address these challenges.

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.

- To develop writing and speaking skills in order to present succinct descriptive and analytical briefing papers and oral presentations on the readings, field lab, and “in country” experiences.

REQUIRED TEXTBOOKS:

AUTHOR: Don Hinrichsen
 TITLE: The Atlas of Coasts and Oceans
 PUBLISHER: University of Chicago Press
 ISBN-13: 9780226342269
 DATE/EDITION: 2011/ 1st Edition
 COST: approx. \$22 new

AUTHOR: Kaiser, Attrill, et al.
 TITLE: Marine Ecology: Processes, Systems, and Impacts
 PUBLISHER: Oxford University Press
 ISBN-13: 978-0199227020
 DATE/EDITION: 2011/2nd Edition
 COST: approx. \$60 new

Other readings from the primary literature will be assigned and provided to the students.

TOPICAL OUTLINE OF COURSE

Depart Hamburg, Germany – September 9

A1–September 11: Introduction
 Reading: Kaiser Chapter 1

A2–September 13: Ecology of the oceans
 Reading: Kaiser Chapter 1

Barcelona, Spain – September 15-16 ***Valencia, Spain – September 17-18***

A3–September 19: Primary productivity and patterns of biodiversity: the Mediterranean
 Reading: Kaiser Chapter 2; UNEP: State of the Mediterranean Coast

A4–September 21: Plankton towing lab: sampling ocean productivity from the MV World Odyssey

No Class – September 23

A5–September 24: Estuaries and shorelines
 Reading: Kaiser Chapter 4; Mikhailov et al 2008 and WACA 2008

A6–September 26: Continental shelf systems- Africa’s Skeleton Coast

Reading: Kaiser Chapter 7

Tema, Ghana – September 27-28
Takoradi, Ghana – September 29-30

Community Programming—October 2: No Class

A7—October 3: Coral Reefs: crossing the Darwin Point
Reading: Kaiser Chapter 10; Grigg 1982

A8—October 5: Mangrove forests and seagrass: how agriculture in Ghana has contributed to their decline
Reading: Kaiser Chapter 9; Coleman et al 2004

Cape Town, South Africa – October 7-12

A9—October 13: Polar regions: how the Benguela current links South Africa to the Antarctic
Reading: Kaiser Chapter 11; Leduc et al 2010

A10—October 15: Drivers of Change 1: Human population growth and the coastal environment
Reading: Hinrichsen Pages 11-30; student selected paper

No Classes/study day – October 16

A11—October 18: Threats to estuaries, marshes and mangrove forests: Mauritius as a case study
Reading: Hinrichsen Pages 42-47; 62-65; student selected paper

Port Louis, Mauritius – October 19

No Class/study day – October 21

A12—October 22: Drivers of Change 2: Global climate change and impacts to island nations
Reading: Hinrichsen Pages 72-85; student selected paper

A13—October 24: Coral reef degradation and rehabilitation: spotlight on the reefs of Southeast Asia
Reading: Hinrichsen Pages 48-49; student selected paper

Cochin, India – October 25-30

Reflection and study (Global Studies Reflection) – October 31

A14—November 2: Mid-term exam

Yangon, Myanmar – November 4-8

A15—November 9: Harmful algal blooms; causes and consequences

Reading: Hinrichsen Pages 34-41; student selected paper

Community Programming—November 11: No Class

A16—November 12: Drivers of Change 3: Effects of overfishing – Bycatch and habitat damage

Reading: Kaiser Chapter 12; Hinrichsen Pages 50-51; student selected paper

Ho Chi Minh City, Vietnam – November 14-18

A17—November 19: Effects of aquaculture on coastal habitats: the shrimp farms of Vietnam

Reading: Kaiser Chapter 13; Hinrichsen Pages 66-69; student selected paper

No Class/study day – November 21

A18—November 22: Artisanal fisheries and their management: observations from the Mekong delta

Reading: Pomeroy et al 2009; student selected paper

Shanghai, China – November 24-29

A19—November 30: Marine Protected Areas (MPAs): Success stories

Reading: Hinrichsen Pages 94-101; student selected paper

Kobe, Japan – December 2-6

A20—December 7: Drivers of Change 4: Pollution and marine invasive species: the Japanese tsunami as an invasive species dispersal agent

Reading: Carlton et al 2017; student selected paper

A21—December 9: Plastic pollution and marine contamination- using seabirds as indicators of ocean health

Reading: Vegter et al. 2014; Young et al 2009; student selected paper

A22—December 11: Plankton tow part 2: comparing results

A23—December 13: Student presentations

A24—December 15: Student presentations

Honolulu, Hawaii – December 16

No Class/study day – December 18

A25—December 19: Final Exam

San Diego, California – December 23

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 independent field assignments that span multiple countries.

Field Class & Assignment

The field class for this course will take place on November 29 in Shanghai, China

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 at least 20% of the contact hours for each course, and are developed and led by the instructor.

Field Class Title: Estuary conservation in the Yangtze Estuary: the challenges of providing habitat for native ecosystems, and drinking water for 20 million people.

Field Class Description: Students will visit the World Wildlife Fund (WWF) headquarters and the Yangtze Estuary in Shanghai, China. Situated on the productive Yangtze Estuary, Shanghai is one of the largest cities in the world and perhaps nowhere else on earth is the interaction between freshwater, coastal areas and large human populations more striking. During the visit, students will learn about the ecology of the Yangtze Estuary, and how WWF works to protect water sources in the Huangpu River, restore wetland habitat and help provide safe drinking water for more than 20 million people.

Field Class Learning Objectives:

1. Observe the estuary and marine habitats in Shanghai
2. Meet with restoration biologists in the area and discuss conservation and social challenges in restoring estuary habitat.
3. Develop an appreciation of the interaction between nature and man's impact on the ecosystem.

INDEPENDENT FIELD ASSIGNMENTS:

Comparison across ports

Each student will choose a topic to examine more deeply by making a comparison across the ports of our voyage. Field notes will need to be kept and each student will present their topic before the class in the style of a speed talk at a scientific conference (5-6 minute Powerpoint talk, 2-3 minutes of questions from the audience). All presentations will be posted on Canvas. Each student will also provide a set of 3 questions relevant to their chosen issue to be considered for use on the final exam.

Discussion and Debate

Starting mid-way through the voyage, class periods will be centered around an in-class discussion focused on papers from the scientific literature. A team of 2-3 students will be assigned to lead each discussion section. The lead students are expected to submit 3-5 discussion questions on the reading no later than the class period before the discussion. Each student in the course must come to each discussion section prepared to discuss these

questions and critique the paper. At the start of the discussion, the lead students will provide a concise overview of the paper. In the summary, students should: 1) review the major points of the paper, 2) highlight novel results and conclusions, 3) relate the paper to other readings or discussions in class or your own knowledge, and 4) raise questions or objections you have with the methods, results, and/or conclusions. Following the summary, the lead students should then be prepared to actively generate and facilitate discussion for the rest of the allocated time. You will be assigned a grade for leading the discussion.

Op-Ed Article/Advocacy Letter and Elevator Talk

Each student will be required to write a brief (300-500 word) “Op-Ed” or Advocacy letter on a current coastal ecology or environmental topic or issue of their choice. The article should be written for an appropriate outlet (e.g., local, regional, national or international newspaper, depending on the scope of your issue; your congressperson). We will workshop the articles in class and your classmates will provide suggestions for improvement before submission to the instructor and (optional) submission. You will also give a 60-90 second “elevator talk” on your topic in class towards the end of the voyage. More details on this assignment will be given in class.

METHODS OF EVALUATION/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 SAS 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	

<u>Item</u>	<u>% of Final Grade</u>
Discussion Lead	5%
Debate	15%
Op-Ed/Advocacy Article	10%
Elevator Talk	5%
Field trip Essay Assignment	10%
Comparison Across Ports Presentation	15%
Midterm Exam	15%
Final Exam	20%
Participation and Attendance	5%

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 the student's home institution verifying the accommodations received on their home campus (dated within the last three years) is required before any accommodation is provided on the ship. Students must submit this verification of accommodations to academic@isevoyages.org as soon as possible, but no later than two months prior to the voyage.

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

None

FILM REQUEST:

BBC Blue Planet Series
BBC Wild Pacific Series

ELECTRONIC COURSE MATERIALS

Supplementary reading and reference materials will be posted in the course folder online.

ADDITIONAL RESOURCES

None