Semester at Sea Course Syllabus
Colorado State University, Academic Partner

Voyage:	Fall 2017
Discipline:	Natural Resources
Course Number and Title:	NR 300 Biological Diversity
Division:	Upper
Faculty Name:	Dr. Paul F. Doherty, Jr.
Semester Credit Hours:	3

Meeting: B Day 0800-0920, Kino
Prerequisites: One (1) biology or environmental conservation course

COURSE DESCRIPTION

The 6th mass extinction is currently underway and maintenance of biological diversity is one of the great challenges with which our world is struggling. This course will provide students with an appreciation and understanding of global patterns of species diversity and extinction as well as consequences of biotic impoverishment. Students will learn relevant theory, principles, and practices to understand and resolve conservation issues. The Semester at Sea voyage will uniquely allow first-hand experience with global patterns of diversity, as well as conservation actions in practice. Throughout the voyage students will gain a deep understanding of, and be able to compare, biological diversity challenges faced by countries with different cultures, economic means, and population sizes.

LEARNING OBJECTIVES

1) Understand the theoretical foundations of conservation biology.

2) Be conversant about the political, social, and economic consequences of biotic impoverishment and the need to balance the needs of people with nature.

3) Define the tools used to maintain biodiversity and apply them to contemporary issues in conservation biology.

4) Apply techniques for communicating conservation biology.

REQUIRED TEXTBOOKS

AUTHOR:	Richard. B. Primack and Anna A. Sher
TITLE:	An Introduction to Conservation Biology
PUBLISHER:	Sinauer Associates, Inc. Publishers
ISBN #:	9781605354736
DATE/EDITION:	2016/1st

TOPICAL OUTLINE OF COURSE

Depart Bremerhaven, Germany — September 9

B1—September 12:

Topic: Introduction to Conservation Science
Readings: Primack and Sher Chapter 1; Soule 1985; Kareiva & Marvier 2012
Assignment: Choose your discussion weeks; Skim book for Op-Ed article topic ideas and Comparison Across Ports paper and presentation.

B2—September 14:
Topic: What is Biodiversity?
Readings: Primack and Sher Chapter 2; Spain's Biodiversity Report

Barcelona, Spain — September 15-18

B3—September 20:
Topic: The Value of Biodiversity
Readings: Primack and Sher Chapter 3
Assignment: Choose Op-Ed article topic; Choose Comparison Across Ports topic

B4—September 22:
Topic: Ecosystem Services
Readings: Boyles et al. 2011; McCauley 2006 & replies
Assignment: Debate (Ecosystem services)

No Class — September 23

B5—September 25:
Topic: Status of Ghana's Biodiversity; Threats to Biodiversity
Readings: Skim Ghana's Biodiversity Strategy; Read Ghana's 5th National Biodiversity Strategy; Nunez-Iturri & Howe 2007 (bush meat); Primack and Sher Chapter 4 pgs 90-112 (Human population growth, Habitat destruction and fragmentation, environmental degradation and pollution)

Tema and Takoradi, Ghana — September 27-30

B6—October 1:
Topic: Threats to Biodiversity
Readings: Primack and Sher Chapter 4 pgs 90-112 (Human population growth, Habitat destruction and fragmentation, environmental degradation and pollution); Nunez-Iturri & Howe 2007 (bush meat).

B7—October 4:
Topic: Threats to Biodiversity
Readings: Primack and Sher Chapter 4 pgs 118-125 (Global Climate Change); McClachlan et al. 2007; Ricciardi & Simberloff 2009
Assignment: Debate (assisted migration)

B8—October 6:
Topic: Status of South Africa's Biodiversity

Readings: Primack and Sher Chapter 4 pgs 126-131 (Overexplotation); Skim 5th National Biological Diversity Report for South Africa; Read Brashares et al. 2004; Biggs et al. 2013; Wasser et al. 2010

Cape Town, South Africa — October 7-12

B9—October 14:

Topic: Threats to Biodiversity
Readings: Primack and Sher Chapter 4 pgs 132-149 (Invasive Species, Disease); Davis et al. 2011 & replies; Keesling and Ostfeld 2015 Disease and Biodiversity.
Assignment: Debate (Don't judge species by their origins; Davis et al. & replies)

No Class — October 16

B10—October 17:

Topic: Extinction is Forever
Readings: Primack and Sher Chapter 5 pgs 150-171.
Assigment: Submit Op-Ed article for peer review

Port Louis, Mauritius — October 19

B11—October 20:

Topic: Problems of Small Populations
Readings: Primack and Sher Chapter 5 pgs 172-191; Mauritius Biodiversity Profile; Nature letter - Mauritius threatens its own biodiversity; Florens and Baider, 2013.

No Class — October 22

B12—October 23:

Topic: Exam 1; Biodiversity in India
Readings: Biodiversity hotspots in India
Assignment: Exam 1

Cochin, India — October 25-30

No Class — October 31

B13—November 1

Topic: Conserving Populations and Species
Readings: Primack and Sher Chapter 6 pgs 192-211 (PVA, metapopulations, long-term monitoring); Bakker and Doak 2009.

B14—November 3:

Topic: Conserving Populations and Species
Readings: Primack and Sher Chapter 6 pgs 212-233 (Conservation strategies and legal protections); AMBIO (2013; 42:789-804) A Review of Threats and Implications for Conservation Planning in Myanmar

Yangon, Myanmar — November 4-8

B15—November 10:

Topic: Bringing species back from the brink
Readings: Primack and Sher Chapter 7 pgs 234-262; Donlan et al. 2006 (rewilding); *NYT Magazine*: The mammoth cometh
Assignment: Debate (Rewilding)

No Class — November 11

B16—November 13:

Topic: Protected Areas
Readings: Primack and Sher Chapter 8 pgs 264-282; Ziv et al. 2011; Smith, D. Guardian. 2011; Nuwer, R. 2015 (Wildlife Smuggling in Vietnam NY times article).

Ho Chi Minh City, Vietnam — November 14-18

B17—November 20:

Topic: Protected Areas
Readings: Primack and Sher Chapter 8 pgs 283-303 (networks of protected areas, landscape ecology, challenges to park management).
Assignment: Watch Racing Extinction movie

No Class — November 21

B18—November 23:

Topic: Conservation Outside Protected Areas
Readings: Primack and Sher Chapter 9 pgs 304-317 (Value of unprotected habitat, Conservation in urban areas); Lim, B.K. Biodiversity in China: Lost in the Masses?; Yu, W. and J.J. Czarnezki. Challenges to China's Natural Resources; Dudgeon, D. 2010.

Shanghai, China — November 24-29

B19—December 1:

Topic: Conservation Outside Protected Areas
Readings: Primack and Sher Chapter 9 pgs 318-335 (Ecosystem management, working with local people); Sushinsky et al. 2013; Skim The National Biodiversity Strategy of Japan.
Assignment: Watch "RiverWebs" and read Saito et al.
Watch "The Cove" and "Behind the Cove – the Quiet Japanese Speak Out" and read Conservation Magazine whale article

Kobe, Japan — December 2-6

B20—December 8:

Topic: Restoration Ecology

Readings: Primack and Sher Chapter **10;** Fischer et al. 2008

B21—December 10:

Topic: The Challenges of Sustainable Development
Readings: Primack and Sher Chapters **11, 12.**
Assignment: Op-Ed article due and elevator talks.

B22—December 12:

Topic: Oral presentations

B23—December 14:

Topic: Oral presentations

Honolulu, Hawaii — December 16
Proposed field trip to US Fish and Wildlife refuge and management sites on the North Shore of Oahu (e.g., Kaena Point, Mokili Point, James Campbell National Wildlife Refuge).

(*field trips will be approved by Semester at Sea about 6 months before the voyage)

B24—December 17:

Topic: Hawaiian Biodiversity and Invasive Species
Readings: Benning et al. 2002; Vitousek et al. 1987; Peychar and Mooney 2009; Peychar 2015

B25—December 20; B Day Finals

San Diego, California — December 23

Discussion and Debate

During many class periods we will have an in-class discussion focused on papers from the scientific literature. Typically, a team of 2 students will be assigned to lead each discussion section. The lead students are expected to submit 3-5 discussion questions on the reading for posting on Moodle 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, you 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.

There will also be four debates that focus on important emerging issues in conservation biology. Details on the topic and structure of the debates will be provided in class.

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 conservation biology 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.

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 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.

Field Class & Assignment

The Field Class for this course will take place on Saturday, December 16 in Honolulu.

Class Title: Management of Hawaiian Biodiversity in the Face of Climate Change and Invasive Species

Description: We will meet with US Fish and Wildlife Service (USFWS) colleagues who are working to maintain the wildlife biodiversity of the Hawaiian Islands in the face of climate change and invasive species. We will discuss USFWS mitigation strategies, including developing movement corridors and assisted translocation, with a focus on an island setting. We will spend a day in the field with our USFWS colleagues, and visit sites (e.g., Kaena Point, Mokili Point, James Campbell National Wildlife Refuge) at which they work. These areas are proving important for management of seabirds (many we will have seen from the ship as we traveled around the world) as many seabird colonies are being lost. We will see the effects of predator management (e.g., predator proof fencing) and translocation on albatross and other animals. We will discuss the effects of climate change on thermal ecology, implications of shifting prey species, and future management options.

Objectives:
1) Understand the past and current state of biodiversity of the islands, especially with respect to seabirds that we have observed from the ship throughout our voyage.
2) Comprehend current management challenges such as those relating to climate change and invasive species.
3) Gain experience with these problems as well as possible solutions.

Assignment:
Students will be submit an essay (with supporting material) about challenges to maintaining Hawaiian biodiversity, possible management actions, and what they predict will be the future for Hawaiian biodiversity.

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 Moodle. Each student will also provide a set of 3 questions relevant to their conservation issue to be considered for use on the final exam.

METHODS OF EVALUATION / GRADING SCALE
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).

Item	% of Final Grade
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%

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

Excellent	Good	Satisfactory/Poor	Failing
97-100%: A+	87-89%: B+	77-79%: C+	Less than 60%
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.

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 memo from the student's home institution verifying the accommodations received on their home campus 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 AND FILMS FOR THE LIBRARY

AUTHOR: Richard. B. Primack and Anna A. Sher
TITLE: An Introduction to Conservation Biology
PUBLISHER: Sinauer Associates, Inc. Publishers
ISBN #: 9781605354736
DATE/EDITION: 2016

AUTHOR: Richard B. Primack
TITLE: Essentials of Conservation Biology 6th Edition
PUBLISHER: Sinauer Associates, Inc. Publishers
ISBN #: 978-1-60535-289-3
DATE/EDITION: 2014/6th

AUTHOR: Kolbert, E.
TITLE: The Sixth Extinction: An Unnatural History
PUBLISHER: Henry Holt & Company
ISBN #: 978-0-8050-9299-8
DATE/EDITION: 2014

Films: RiverWebs; Racing Extinction; The Cove; Behind the Cove–The Quiet Japanese Speak Out

ELECTRONIC COURSE MATERIALS

Available in the course folder