MRSC A119: OCEAN CONSERVATION AND COMMUNITY SCIENCE

Item	Value
Curriculum Committee Approval Date	11/13/2024
Top Code	040100 - Biology, General
Units	3 Total Units
Hours	90 Total Hours (Lecture Hours 36; Lab Hours 54)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	No
Basic Skills	Not Basic Skills (N)
Repeatable	No
Open Entry/Open Exit	No
Grading Policy	Standard Letter (S), • Pass/No Pass (B)

Course Description

This course focuses on the intersection of conservation, community science and aquaria. Students will learn about animal rescue, technologies for breeding animals for release into the wild, community science and monitoring, habitat restoration, and impact of climate change on coastal resilience. Students will explore the role aquaria can play in communicating the importance of marine conservation, climate science and establishing community science programs. This course is a collaborative effort with Orange Coast College and local aquaria with all meetings held offsite in specialized facilities. Transfer Credit: CSU.

Course Level Student Learning Outcome(s)

1. Identify major conservation issues facing the ocean today and provide potential solutions.
2. Describe examples of how aquaculture is currently being used in conservation.
3. Identify the importance and challenges in marine animal rescue, rehabilitation, recovery, release.
4. Describe different strategies that can be used for community engagement in ocean conservation.

Course Objectives

- 1. Describe the permitting process and state and federal agencies that partner on wildlife rescue efforts.
- 2. Describe best practices for messaging regarding climate change, with a focus on reaching climate skeptics or climate change minimizers.
- 3. Design volunteer-based community science monitoring efforts.
- 4. Assess visitor response to different exhibits, and determine what the visitor learns from an exhibit.
- 5. Identify reputable sources for up-to-date data on marine species and environmental conditions.
- 6. Evaluate different channels for public outreach ranging from social media, to live-experiences at aquarium, to virtual programing, to written articles and reports.
- 7. Know how to fact-check and verify conservation stories or environmental stories that circulate on the internet.
- 8. Demonstrate how to connect an ocean environmental problem into something salient to an individual?s daily life.
- 9. List the current major ocean problems off the coast of California and the primary approaches to addressing these problems.
- 10. Describe the different ways drones, remote sensing, un-maned submersibles, and robotics can contribute to ocean conservation.
- 11. Demonstrate proper data collection and record keeping in a collaborative group setting.
- 12. Be conversant in ?the blue economy? and what it might mean for ocean conservation.

Lecture Content

I. The history of marine conservation A. Major global trends in marine ecosystemsB. The emergence of marine conservation as a discipline II. The history of aquaria around the world and their connection to conservation A. Tour of aquaria and the controversy around Cetaceans in captivityB. Conservation programs in aquaria.C. Emma Marris critique of animals in captivity III. California s Marine Conservation challenges A. SewageB. Global warmingC. Habitat loss IV. Species rescue and recovery projects A. Otter surrogate mothersB. Mountain Yellow-legged frogC. AbaloneD. Bull kelp V. Community Science projects A. Sea turtlesB. Sea bass recoveryC. Shark identificationD. Review of satellite images VI. Climate Science Communication A. The importance of framingB. Meet your audience where it isC. Making it personalD. Avoid adding to climate anxiety VII. Ocean food systems and Conservation A. Seafood sustainability scorecardB. What works for restaurants?C. Messaging for the public on Aquaculture VIII. Technology for Ocean Conservation A. Drones and robotsB. Remote sensing and satellitesC. Genetic engineering and accelerated evolution IX. Media and information channels for conservation lessons A. Short videos and filmsB. Social mediaC. Prestige outletsD. Partnering with schoolsE. Signage and exhibit design X. Tradeoffs and competing interest in the Blue Economy A. Economy and job growth versus the environmentB. The role of ports, and the impact of shipping on marine lifeC. Ocean zoning XI. Visioning a future for Long beach and the Coastal ocean A. Sea level riseB. Public access to the oceanC. Migrating speciesD. Local seafood In addition, throughout we will bring in or view individual species (otters, sea bass, frogs, penguins, octopuses, etc) to demonstrate concepts and challenges.

Lab Content

I. Behind the scenes look at on-site captive breeding and rescue programs A. What is success?B. Design criteria for habitatsII. Visitor behavior how do visitors react to and interact with educational videos? III. Examine Data from sea turtle monitoring A. What are the data telling us B. Would you change data collection? IV. Design a study that looks at YouTube downloads and evaluates success of different short videos V. Do animals show any sign of aberrant behavior as a result of confinement? Observations of particular species in captivity. VI. Evaluate signage, and suggest improvements.VII. Explore NOAA and USFWS ublic data regarding species and environmental change.

Method(s) of Instruction

- Lecture (02)
- DE Live Online Lecture (02S)
- DE Online Lecture (02X)
- Lab (04)
- DE Live Online Lab (04S)
- DE Online Lab (04X)

Instructional Techniques

This class will employ a variety of instructional techniques. Weekly lab meetings will incorporate class discussions led by the instructor. Student presentations on special topics will commonly accompany these discussions. Guest speakers and field trips will help provide additional specialized information. Students will engage in a variety of hands-on practice and application of techniques discussed in class.

Reading Assignments

Reading assignments will be based on researching information related to weekly assignments or group projects that span several weeks. (About 1.5 hours / week)

Writing Assignments

Out of class assignments will be based on observing visitors, examining websites of other aquaria, developing short educational videos, and evaluating local community science programs. (About 0.5 hours / week)

Out-of-class Assignments

Writing assignments will entail producing materials for conservation lessons, or on reporting the results of a lab or team project. (About 1 hour / week)

Demonstration of Critical Thinking

Critical thinking will permeate this course. Students will be asked to evaluate the credibility of different sources of environmental information; they will need to assess and form an opinion on the critique of animals in captivity; they will need to evaluate different ways of communicating climate science; they will need to consider competing views on the possibilities provided by captive breeding in aquaria. They should be able to analyze how different audiences might warrant different messages, and how different species might require different conservation approaches.

Required Writing, Problem Solving, Skills Demonstration

Students will be evaluated by their reports, and the learning modules or videos they produce. They will also be evaluated on their ability to design practical community science efforts. They will be expected to be able to reason when animal rescue is not a wise investment. The skills involved include some examination of data and synthesis of data, leading a discussion of a polarizing topic (such as animals in captivity), designing surveys or observations, and oral reports.

Eligible Disciplines

Biological sciences: Master's degree in any biological science OR bachelor's degree in any biological science AND master's degree in biochemistry, biophysics, or marine science OR the equivalent. Master's degree required. Biological sciences: Master's degree in any biological science OR bachelor's degree in any biological science AND master's degree in biochemistry, biophysics, or marine science OR the equivalent. Master's degree required.

Other Resources

1. Handouts per instructor