# MRSC A288: SURVEY OF MARINE MAMMAL RESEARCH AND TECHNIQUES

| Item | Value |
|---|---|
| Curriculum Committee Approval Date | 10/20/2021 |
| Top Code | 040100 - Biology, General |
| Units | 1 Total Units |
| Hours | 36 Total Hours (Lecture Hours 9; Lab Hours 27) |
| 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) |

## Course Description

This class provides students with an experiential survey of various types of marine mammal research. Students will explore marine mammal science conducted both in situ (natural habitat) and ex situ (zoological facilities) including: population counts, photo identification, acoustic and behavioral studies, wild animal health assessments and other research on human impacts on the marine environment. Students will get the opportunity to survey a wide scope of marine mammal research. ADVISORY: MRSC A187. Transfer Credit: CSU.

## Course Level Student Learning Outcome(s)

1. Examine research techniques and understand their importance in ecology and conservation of marine mammals.
2. Employ various data collection techniques as well as process and analyze data.

## Course Objectives

- 1. Identify different areas of marine mammal research and describe why they are important.
- 2. Describe why both in situ and ex situ research studies are important to understanding the broader picture of marine mammal ecology and conservation.
- 3. Identify several human activities that are negatively affecting the marine environment as well as research studies that support this.
- 4. Understand different methods of data collection used in field research.

## Lecture Content

Assessment of human impact Exposure to chemicals, sound, vessel traffic Diseases and Implications Physiology and Sensory Systems Diving physiology Sensory capacity Sound reception Acoustic studies Population and Behavioral studies Mark-recapture Ethology Remote sensing Population modeling Research in a rehabilitation setting Environmental Enrichment Stereotypical behaviors Olfactory enrichments

## Lab Content

Remote Sensing Plotting data on map overlays Data analysis Drawing conclusions Mark-recapture techniques Data collection, processing and analysis Photo-identification with cetaceans Tagging with pinnipeds Mastering (employing) techniques Assessing body condition of animal Re-sightings and citizen science tools Behavioral research to assess health Value of enrichment in rehabilitating animals Early vs. late rehabilitation state

## Method(s) of Instruction

- Lecture (02)
- Lab (04)
- Field Experience (90)

## Instructional Techniques

This class will include a variety of instructional techniques.  Each class period will comprise of lecture on content and discussion amongst the class on various modes of studying marine mammals in situ and ex situ. Student presentations on special topics will often be part of class meetings. The class will primarily be held offsite at a marine mammal rehabilitation facility and in the coastal region from land or small research vessels. The student will participate in hands-on techniques that are discussed in lecture and also in their readings.

## Reading Assignments

Reading assignments will be from current journal articles and relevant textbook material appropriate for the topic. 10 hours.

## Writing Assignments

Writing assignments will be based on research projects and logging their experiences in a course journal. 6.345 hours.

## Out-of-class Assignments

Participate in Zooniverse or similar project that connects students to assist professional researchers by actively contributing useful data to larger projects conducted both nationally and internationally.Students will also prepare an oral presentation. 6.345 hours.

## Demonstration of Critical Thinking

Journals and Exams will require students answer a prompt that requires analysis and problem solving. Their quizzes will include essays/brief responses in addition to multiple choice, true and false, and matching questions. Students will also report about their research assignment relating to citizen science.

## Required Writing, Problem Solving, Skills Demonstration

Journal entries will be completed for each field activity that include summaries of what was done and the importance of what they learned with respect to the field of marine mammal field science. Students will be required to demonstrate various technical skills related to in situ and ex situ marine mammal research techniques.

## 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.

## Periodicals Resources

1. TM Mongillo. Exposure to a Mixture of Toxic Chemicals: Implications for the Health of Endangered Southern Resident Killer Whales;, NOAA Technical Memorandum Volume NMFS-NWFSC-135 2016 2. MM Holt. ound Exposure and Southern Resident Killer Whales (Orcinus orca);, NOAA Technical Memorandum Volume NMFS-NWFSC-89 S 2008 3. SG Barco. : Collaborative Development of Recommendations for Euthanasia of Stranded Cetaceans, NOAA Technical Memorandum Volume NMFS-OPR-56 2016 4. Chudeaua, et. al.. Enrichment reduces stereotypical behaviors and improves foraging development in rehabilitating Eastern Pacific Harbor Seals (Phoca vitulina richardii) ;, Applied Animal Behaviour Science Volume 2019 5. Samuelson et. al.. Olfactory Enrichment in California Sea Lions (Zalophus californianus): An Effective Tool for Captive Welfare?, Journal of Applied Animal Welfare Science (J Appl Anim Welfare Sci) Volume 20(1):1-11 2016 6. XITCO, et. al. Object recognition through eavesdropping: Passive echolocation in bottlenose dolphins, Animal Learning Behavior Volume 24 (4), 355-365 1996 7. Edited by Hammond, et al. Individual Recognition of Cetaceans: Use of Photo-Identification and Other Techniques to Estimate Population Parameters, International Whaling Commission Volume Special issue ; 12 1990