New courses are available beginning with the fall term in which they appear in the University Catalog.

**Florida Institute of Technology**

Adding a New Course to the Curriculum

This is a request for reactivation of a course in the system. ☐ Yes  ■ No

Subject: BI  O  Course No.: 3621  Credit Hours: 3  Academic Year to be Added to the File: Fall 2018

*Justify level if 1000-level+ and no co- or prerequisites.*

Class Hours: 45 Semester  Lecture Hours: 32  Lab Hours: 16  Field Work: 30  Contact Hours: (CEU only)

Department: Biological Sciences

☐ College of Aeronautics – 23  ☐ College of Psychology and Liberal Arts – 25
☐ Nathan M. Bisk College of Business – 24  ☐ College of Science – 26
☐ College of Engineering and Computing – 01  ☐ School of Human-Centered Design, Innovation and Art – 28

Computer Title: Marine Mammals Pacific NW

This course will be entered into the system as: Bi-Level ☐ Cross-Listed ☐ Dual-Numbered ☐ Full-Load ☐ None of these/Standard Listing ■

Catalog Title: Marine Mammal Studies in the Pacific Northwest

Catalog Description of Course: Restricted to 350 characters, including spaces

Explores the biology of marine mammals and how that biology has been shaped by the marine environment. Focuses on current techniques for collecting behavioral, spatial and physiological data in different habitats. Requires a field trip to the San Juan Islands, Washington.

This description has been approved by the catalog office. [Signature] 4/27/2017

In addition, please attach a course syllabus and/or more detailed description.

Restrictions: ■ Prerequisite BIO 1020

Course Number:  

☐ Prerequisite Course Number:  

☐ Corequisite Course Number:  

☐ and ☐ or

Grades to Be Issued: ■ A, B, C, D, F  ■ A, B, C, D, F, CEU/Audit

☐ CEU  ■ S, U  ■ R, F  ■ Other

Additional Restriction: ☐ and ☐ or

(e.g., Major, Grade Level, Department Head Approval)

If this course replaces a course currently offered in BANNER, please indicate old course information and the date/term the course may be removed from the system.

Subject: BI  O  Course No.: 3011  Term to Inactivate:  

☐ Yes  ☐ No  Will this course be used to measure program-level student learning outcomes? If yes, review and signature required.**

☐ Yes  ☐ No  Will this course be used to satisfy the scholarly inquiry requirement? If yes, attach "Q" materials for review.

☐ Yes  ☐ No  Will this course impact any existing programs? If yes, attach "Changing Graduation Requirements" form for each program impacted.

Approvals: On completion of description and course number verification, affix appropriate signatures as indicated, and submit to the Office of Graduate Programs, or Undergraduate Curriculum Committee Chair for placement on agenda.

[Signature] 3/17  [Signature] 3/17

Date  Date

Chair, Graduate Council  Date

Or

Date

Chair, Undergraduate Curriculum Committee  Date

[Signature] 5/17  [Signature] 5/17

Date  Date

Chair, Academic Programs Assessment Committee  Date

Catalog & Curriculum Manager  Date

Registrar’s Use Only

SCACRSE  SCADTL  SCAPRO  SCABASE  A CaitLOG  SCARRES  CIP Code  Operator Init.  Date

Florida Institute of Technology • Office of the Registrar

150 West University Boulevard, Melbourne, FL 32901-6975 • (321) 674-8114 • Fax (321) 674-7827

**Chair, Academic Programs Assessment Committee

Elective Course; Part of BIOSUM Field Courses
Marine Mammal Studies in the Pacific Northwest  
BIO 3621  
Summer 2018 Syllabus

Instructor:  
Spencer Fire, Ph.D.  
sfire@fit.edu  
321.674.7138

Prerequisites: BIO1020

Course description:  
This course will explore the ecology, physiology and evolutionary history of marine mammals, including: cetaceans (whales, dolphins and porpoises), pinnipeds (seals, sea lions and walruses), sirenians (dugongs and manatees), polar bears and sea otters. The course will study these species in the context of how they have been shaped by their marine environment, particularly in highly productive coastal regions. As such, students will also develop a basic understanding of the oceanographic processes that drive natural selection in marine mammals.

Students will spend two weeks in the San Juan Islands (Washington State), a region of high biological productivity and high diversity and abundance of coastal marine mammals. Here they will participate in classroom lecture, laboratory and field work focused on marine mammals of the Pacific Northwest region of North America. Each student will be able to observe these animals in the wild and learn the basic tools and techniques of marine mammal research. The class will also explore scientific primary literature and selected case studies highlighting marine mammal adaptations to an aquatic lifestyle, as well the physical and biological properties of the ocean that has driven their evolution.

The bulk of the student’s time during this course will be split between 1) field observations of marine mammals in their natural habitat (data collection) and 2) lecture/laboratory instruction of concepts and current techniques (data analysis). Boat- and land-based observations and data collection will take place each morning/early afternoon, depending on weather conditions. Students will develop strong identification skills as well as becoming familiar with behavioral ethograms, social structure, field photography, small boat operation and data collection methods. Late afternoon/evening activities will involve instruction on marine mammal adaptations as well as analysis of behavioral and geospatial data collected during field observations. Both aspects of the course will provide students sufficient data and knowledge to complete an independent project of their choosing. The course will terminate with an oral presentation of their project’s results, as well as short group presentations on selected journal articles.

Curriculum Topics (Lecture/Guest speakers):
  ● Marine mammal evolutionary history  
  ● Basic oceanography, with emphasis on the Pacific Northwest and coastal upwelling  
  ● Physiological, anatomical, and behavioral adaptations of marine mammals  
  ● Conservation issues and threats to marine mammal health  
  ● Impacts of harmful algal bloom toxins on marine mammals  
  ● Marine mammal stranding response and anatomy
• Bone collections at The Whale Museum
• Scientific method, experimental design, operational definitions, variables, and statistical methods.

Field and laboratory topics:
• Sampling/identification of planktonic organisms as the base of the marine food web
• Marine mammal life history and a veterinary perspective on disease
• Land-based behavioral observation techniques
• Boat-based survey and transect techniques
• Photo Identification techniques
• Mapping & basic analysis of spatial data
• Behavior, ethograms and inter-observer variability
• Acoustic measurements

Evaluation Criteria

<table>
<thead>
<tr>
<th>Assignment</th>
<th>% of final grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent Research Project</td>
<td>40%</td>
</tr>
<tr>
<td>Group Article Presentation</td>
<td>20%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>40%</td>
</tr>
</tbody>
</table>

Recommended Readings:

Course Schedule
Day 1 - Travel day - arrive at FHL, coordinate lodging logistics
Day 2 - Course introduction (4 hrs., lecture); Observational methods, survey/transect techniques (4 hrs field)
Day 3 - Field observations (4 hrs., field); Ethograms & data, choose independent project topics (4 hrs., lecture)
Day 4 - Field observations (4 hrs., field); Oceanography lecture (4 hrs., lecture)
Day 5 - Field observations (4 hrs., field); Marine mammal taxonomy & identification (4 hrs., lab)
Day 6 - Field observations (4 hrs., field); Mapping and data analysis techniques (4 hrs., lab)
Day 7 - Field observations (4 hrs., field); Journal Article Presentations (4 hrs., lecture)
Day 8 - No class/field work (personal day)
Day 9 - Field observations (4 hrs., field.); physiological adaptations, life history (4 hrs., lecture.)
Day 10 - Field observations (4 hrs., field.); Conservation and health threats, Whale Museum (4 hrs., lecture.)
Day 11 - FLOATING DAY (8 hrs., lab) necropsy techniques - dependent on available carcasses
Day 12 - Whale watching tour (4 hrs., field); Finalize data analysis and project presentations (4 hrs., lecture.)
Day 13 - Independent Project Presentations (4 hrs., lecture)
Day 14 - Travel day - FHL lodging check-out, return home

32 hrs lecture + 36 hrs. field work + 16 hrs. lab work = 84 total hours
Grading Criteria for Independent Projects

Data collection/methods (35 pts):
- Were the data recorded in a way that was consistent throughout the study? (10 pts)
- Did you keep legible, organized records and field notes that can be used by researchers following your work? (10 pts)
- Did you use the best available methods for your type of data collection? (5 pts)
- Did you seek to eliminate potential sources of sampling bias or other confounding factors, to the extent possible? (10 pts)

Data analysis (35 pts):
- Were your data analyzed in a way that was consistent throughout the study? (10 pts)
- Did you use the best available methods for your type of data analysis? (10 pts)
- Did you keep organized files/summaries of your data analysis that can be used by researchers following your work? (5 pts)
- Did you use the appropriate statistical methods to describe your results or infer findings? (10 pts)

Conclusions/Summary (30 pts):
- Are your conclusions supported by the data you collected and analyzed? (10 pts)
- Did you present your findings in a way that is easily understood? (10 pts)
- Did you tie your findings back to solving a problem or data gap? (10 pts)
Grading Criteria for Journal Article Presentations

Introduction (15 pts):
● What you need to know first, in order to understand what comes next (5 pts)
● What was the problem or lack of information the authors identified? (5 pts)
● Why should we care about this problem or lack of information? (5 pts)

Methods (15 pts):
● How did the authors try to solve this problem or address this lack of information? (5 pts)
● What tools or techniques did they use, and how do they work? (5 pts)
● What kind of actual data will be generate? What will the data represent? (5 pts)

Results (10 pts):
● What were the most important findings of the paper? (5 pts)
● How did the data they generated tell them what they wanted to know? (5 pts)

Conclusions/Summary (10 pts):
● What do the results mean in terms of solving the initial problem or lack of information? (5 pts)
● What can be done with the findings from this paper that will benefit marine mammals? (5 pts)

Overall Presentation Quality (50 pts):
● Clarity of speech and verbal expression (5 pts)
● Ability to simplify technical language into everyday terminology (10 pts)
● Ability to explain figures and images in as few words as possible (10 pts)
● Ability to answer questions asked by the class (definitions, methods, instrumentation, difficult concepts) (5 pts)
● Overall organization and ability to choose the most important parts of the paper to discuss (10 pts)
● Ability to lead a class discussion after the presentation (10 pts)