



BIOL-130: MARINE BIOLOGY

Effective Term

Fall 2025

BOT Approval Date

12/14/2023

Discipline

BIOL - Biology

Course Number

130

Course Title

Marine Biology

Short Title

Marine Biology

Credit Status (CB 04)

D - Credit - Degree applicable

Units

Lecture Units

3.00

Lab Units

1.00

Total Units

4.00

Hours

Lecture Contact Hours

48-54

Out of Class Hours Lecture

96-108

Lab Contact Hours

48-54

Out of Class Hours Lab

0.00

Total Contact Hours

96 - 108

Total Out of Class Hours

96 - 108

Total Student Learning Hours

192 - 216

Is this an existing Extensive Lab?

Yes

Distance Education

Yes

Distance Education**Distance Education Type**

Both Fully Online and Hybrid Online

Fully Online Delivery Requirements:

- a. Students must be notified via the college schedule of classes and the syllabus for the class if proctored tests are required for this course
- b. Any planned face-to-face meetings, such as an orientation or study session, must be optional
- c. The MSJC curriculum committee requires the use of accessible, asynchronous discussion as a component of every fully online course

Are you using publisher content?

No

Regular Substantive Interaction

Instructor-to-student, student-to-student, and student-to-content contact shall be distributed in a manner that will ensure regular substantive interaction (RSI) is maintained not only weekly but also for the duration of the course. Instructor interactions should be equivalent in time, quality and consistency to the engagement students would receive in a face-to-face course—for example, through announcements, discussion participation, personalized feedback, video messages, or other instructional communications. Instructors are expected to be responsive to student inquiries within a 24-72 hour time frame excluding holidays. RSI will be maintained through a variety of methods:

- Orientation - Students must be oriented to the online and face-to-face portions at the start of the course.
- Announcements - Announcements using the course management system must be posted at least weekly to keep students current on course events, due dates, materials, etc.
- Discussion Forums - Content-related discussion forums within the designated CMS will include appropriate instructor participation and will be initiated and maintained, with timely feedback provided. Instructors are required to monitor the discussions and related activities to provide guidance and direction. Open-ended discussion boards may be used to further learning and interaction.
- MSJC Communication – Instructor will use MSJC-administered communication tools (such as email or the designated CMS communication tools) to regularly communicate with and provide ease of access to students.
- Timely Feedback - Timely feedback on student work will be provided by the instructor, which may include comments and/or rubrics, within the Grades area of the designated CMS.
- Scheduled Meetings – Hybrid and synchronous courses will meet at regularly scheduled times.

ADA Compliance - All course interactions and content must be designed with accessibility in mind and meet ADA requirements.

Catalog Description

This course explores biology by examining the characteristics of marine organisms and the ocean environment. Some of the topics covered in this course are the physical and chemical environment of the ocean, diversity of marine organisms, marine ecosystems and interactions, adaptations to the marine environment, and human impacts on the oceans. Students may be required to attend field trips. This course is not intended for biology majors.

Codes**TOP Code (CB 03)**

0401.00 - Biology, General

CIP Code

26.0101 - Biology/Biological Sciences, General.

Repeatability Code

No

Grading Option

Letter grade OR P/NP

GE Information**Check GE Types Requested**

AA/AS A - Natural and Physical Sciences

Cal-GETC Areas

Approved Cal-GETC Area

AREA-5B

Approved Second Cal-GETC Area

AREA-5C

Learning Objectives

Learning Objectives

Learning Objective

1. Relate the major properties and characteristics of life to marine organisms within the context of the ocean environment.
2. Compare the organisms, interactions, and physical/chemical characteristics of major marine ecosystems.
3. Compare and contrast tides, waves, currents and their effects on marine organisms.
4. Investigate the major topographic features of the ocean basins.
5. Consider the movement of materials through the major biogeochemical cycles within marine ecosystems.
6. Discover the unity and diversity of marine organisms.
7. Design observations and measurements using the scientific method to investigate marine organisms and their environment.
8. Evaluate the major characteristics, structures, and adaptations of marine plant and protist phyla and divisions.
9. Examine marine macro and microorganisms within their natural environment.
10. Evaluate humanity's effect on marine organisms and ecosystems that overwhelmingly impacts marginalized populations.
11. Compare the sustainable coastal and marine practices of native and historical populations to the overharvesting and commercial practices of today.

Learning Outcome Information

Course Learning Outcomes

Learning Outcome

1. The student will demonstrate the ability to apply the scientific method, document and evaluate laboratory data in marine biology.
2. The student will organize their time and exhibit persistence in completing course work.
3. The student will critically examine the diversity of scientists and career pathways in marine biology, fostering an inclusive mindset towards various identities and experiences within the scientific community.

Program Learning Outcomes

Learning Outcome

Students through persistence will develop problem solving skills in science thinking both critically and abstractly about issues using science as the foundation for understanding.

Students will gain scientific awareness with a flexible approach including a willingness to change perspectives and an ability to weigh alternative options while staying rooted in the understanding of their impact as local, national, and global citizens.

Students will apply past knowledge to new scientific situations, being able to think abstractly regarding science and communicate this newfound knowledge in the language of science and the scientific method.

Students will achieve literacy in the language of science and the scientific method, demonstrating a willingness to respond with wonderment and awe with regards to the physical and biological principles of science, and gather data through all senses.

Students will learn hands-on skills in the laboratory, demonstrate how to measure and collect data from experiments with accuracy and precision, and think critically about the results.

Institutional Learning Outcomes

Communication: The student will effectively express and exchange ideas through listening, speaking, reading, writing, visual works, and other modes of interpersonal expression.

Critical Thinking: The student will analyze problems, gather and synthesize relevant information, evaluate ideas, information, and evaluate alternative points of view to create, innovate and implement effective solutions.

Cultural Awareness and Humility: The student will demonstrate knowledge of and sensitivity toward individuals of diverse ethnicity, age, gender, sexual orientation, and religious affiliations, as well as toward those individuals with diverse abilities and socio-economic classes to respectfully interact with individuals of diverse perspectives, beliefs and values while being mindful of the limitation of their own cultural frameworks.

Information and Technology Literacy: The student will access, interpret, evaluate, and apply relevant information sources and digital media effectively, and in an ethical and legal manner.

Scientific Awareness: The student will apply the scientific method of inquiry to assess potential solutions for real-life challenges by employing science-based knowledge and methodologies in daily life.

Social Awareness: The student will recognize and analyze the interconnectedness of global, national, and local concerns, analyzing cultural, political, social, and environmental issues from multiple perspectives and appreciate similarities and differences among cultures.

Civic

Personal

and Professional Responsibility

Content

Course Lecture Content

I. Physical and Chemical Properties of Sea water

- A. Polar, bent molecule
- B. Compound
- C. Covalent vs. hydrogen bonding (surface tension and viscosity)
- D. Density
- E. Thermal properties
- F. Solvent (dissolved salts and gases)
- G. Light absorption
- H. Sound transmission
- I. Thermocline and thermal stratification
- J. Pressure vs. depth
- k. Sea level rise caused by global warming that is creating climate refugees in impoverished island nations

II. Topography of the ocean basins including the Theory of Continental Drift, plate tectonics, sea floor spreading, and continental drift

- A. Physical Features: Continental Shelf, Continental Slope, Abyssal Plain, Sea Mounts, Mid-ocean ridge/rise systems, Trenches
- B. Plate dynamics
- C. Evidence for the Theory of Continental Drift, plate tectonics, and sea floor spreading

III. Tides, Waves, Currents, Upwelling

- A. Gravity and centrifugal forces
- B. Spring vs. Neap Tides
- C. Diurnal, semi-diurnal, and mixed semi-diurnal tides
- D. Coriolis effect
- E. Wind systems
- F. Properties of ocean waves (wavelength, period, height)
- G. seas, swells, and surf
- H. Deep sea currents and circulation

IV. Characteristics of Living Organisms

- A. Levels of organization
- B. Adaptation (structural, physiological, behavioral)
- C. Response to the environment (salt and water balance, osmosis)
- D. Reproduction (sexual vs. asexual, mitosis vs. meiosis)
- E. Evolution (natural selection and genetics)
- F. Energy requirements (photosynthesis vs. respiration)

V. Phylogeny of Living Organisms

- A. Domains (Bacteria, Archaea, Eukaryota)
- B. Supergroups (Excavates, Chromalveolates, Archaeplastids, Opisthokonts, Rhizaria)

VI. Marine Primary Producers

- A. Protists (Dinophyta, Chrysophyta, Cyanobacteria, Bacillariophyta)
- B. Algae (Chlorophyta, Rhodophyta, Phaeophyta)
- C. Marine plants (Angiosperms)
- D. Life cycles (alternations of generations- sporophyte and gametophyte)
- E. Structures (holdfast, stipe, blade, pneumatocyst, sporophylls)
- F. Economic importance for fisheries and coastal communities
- G. Effects of dredging on primary producers and its impact on local communities internationally

VII. Measuring Productivity in the Oceans

- A. Biochemistry of photosynthesis
- B. Photosynthetic pigments
- C. Net vs. gross primary productivity
- D. Light dark bottle, C14, and satellite monitoring
- E. Seasonal and geographic patterns in productivity
- F. Factors affecting productivity: nutrients, grazing, light, temperature

VIII. Marine Invertebrate Phyla (Porifera, Cnidaria, Ctenophora, Mollusca, Arthropoda, Echinodermata, Annelida, Platyhelminthes, Nematoda, Brachiopoda, Hemichordata, Chordata - Urochordata and Cephalochordata)

- A. Taxonomy and evolutionary relationships
- B. General characteristics (symmetry, segmentation, skeletal - exoskeleton, endoskeleton, hydrostatic)
- C. Anatomy and physiology- organs and systems
- D. Reproduction and metamorphosis (viviparity, oviparity, and ovoviviparity, larval stages)
- E. Case studies of invertebrate harvesting and use in multiple cultures

IX. Marine Vertebrates (Reptilia, Aves, Mammalia)

- A. Classification and evolutionary relationships
- B. General characteristics
- C. Anatomy and physiology- organs and systems
- D. Birds: beak and feather structure/patterns, diving and swimming, salt excretion, reproduction, mating and reproduction, migration, senses
- E. Reptiles (iguana, snakes, and turtles): mating and reproduction, migration, behavior
- F. Fish (Osteichthyes, Chondrichthyes, Agnatha): gill structure and physiology, heart and circulation, lateral line, fins and locomotion, swim bladder, scales, red vs. white muscles, coloration, feeding strategies, reproduction (oviparity, ovoviviparity, viviparity), behavior and migration
- G. Mammals (Pinnipedia, Carnivora, Cetacea - Mysticeti vs Odontoceti, Sirenia): viviparity, behaviors, migration, swimming and diving, feeding, echolocation and communication, thermal regulation
- H. Compare and contrast fishing practices for their sustainability and their impact on marginalized communities.
- I. Examine data that shows that impoverished people are disproportionately harmed/impacted by environmental damage and overfishing.

X. Marine Ecosystems (coral reefs, kelp forests, intertidal, deep sea vent, open ocean, plankton (phytoplankton vs. zooplankton), estuaries)

- A. Trophic relationships (food chains, food webs, biomass pyramids)
- B. Symbiosis (parasitism, commensalism, mutualism)
- C. Biogeochemical cycles

XI. The human effect on the oceans and marine organisms including domestic and international case studies.

- A. Pollution
- B. Over fishing and fisheries management
- C. Mariculture
- D. Marine preserves and conservation
- E. Disproportionate impacts on marginalized communities

Course Lab Content

I. Scientific Inquiry and Scientific Measurement

- A. scientific method

- B. metric system and unit conversion
- C. scientific writing
- II. Basic Chemistry
 - A. atoms, molecules, bonds, and the pH scale
 - B. macromolecules: proteins, lipids, carbohydrates, and nucleic acids
 - C. Salinity, alkalinity, turbidity
- III. Properties of Seawater
 - A. Salinity, density, alkalinity
 - B. Tonicity
 - C. Turbidity, dissolved solids
- IV. Use and care of the Microscope
 - A. 4-lens system, binocular, compound
 - B. working distance, depth and field of view
 - C. contrast
 - D. magnification and resolution
- V. Cell Structure and Function
 - A. plant cells, animal cells and bacteria
 - B. animal and plant tissue
 - C. diffusion, osmosis, plasmolysis
- VI. Biochemical Processes
 - A. enzyme activity
 - B. fermentation and respiration
 - C. photosynthesis
- VII. Mitosis and Meiosis
 - A. mitosis in onion cells and whitefish blastula
 - B. meiosis in lily anthers or rat testes and Ascaris ovaries
- VIII. Taxonomy and Phylogeny
 - A. Zooplankton
 - B. Phytoplankton
- IX. Natural Selection
 - A. differential survival
 - B. differential reproduction
 - C. lek mating system
- X. Survey of the macro algae
 - A. comparative study of representatives of major divisions
 - B. vegetative organs: stem, leaf, and root
 - C. reproduction
- XI. Survey of the Invertebrate Animals
 - A. comparative study of representative animals from the major phyla
 - B. Anatomy, Structure and Function
 - C. dissection of representative taxa
- XII. Survey of Vertebrate Animals
 - A. comparative study of representative animals from the major phyla
 - B. Anatomy, Structure and Function
 - C. dissection of representative taxa
- XIII. Marine mammals
 - A. diversity
 - B. adaptation to the marine environment
 - C. conservation of mammals in the USA and abroad

XIV. Ecology

- A. energy and matter flow
- B. trophic levels
- C. predations, competition, symbiosis
- D. international human impacts on the oceans mainly caused by wealthy countries that have greater impacts impoverished nations
- E. international efforts to preserve the ocean for all people
- F. international efforts to study the ocean

XV. Field Trips

- A. How to conduct field research and adapt to conditions
- B. Work in groups to complete projects
- C. Use of a quadrat to determine species richness
- D. Use of a quadrat to determine species abundance
- E. How to form a transect to collect data
- F. Create and deliver presentations on field research
- G. Develop "next steps" at the conclusion of a project
- H. Learn to repeat experiments to increase the validity of the experiment
- I. All students will make contributions to the field of marine biology and recognize themselves as a citizen scientist

Methods of Instruction

Method

Field Trips

Integration

Field trip experiences to various local marine environments or to local aquariums for observation, identification, and sampling of intertidal marine organisms will be conducted. All students will make contributions to the field of marine biology and recognize themselves as a citizen scientist.

DE Adaptations for MOI

Students are able to use official websites that are accessible and compatible with screen readers and accessible captioned videos from marine/nature organizations, museums, zoos, or aquariums to observe, identify, and gather data and information. Care will be taken to make sure that all materials assigned for online field trips are made accessible for all students. Corresponding worksheets or assignment instructions will be provided within the CMS as either accessible documents or as an accessible webpage.

Method

Film/video Viewing and Discussion

Integration

Scholarly videos like "Seasons in the Sea" will be presented that highlight contributions by scientists and/or citizen scientists from diverse backgrounds and the students will relate these videos to the course content such as the diversity of the seas.

DE Adaptations for MOI

Films will be provided with captions for accessibility and will be posted/linked from within the CMS pages. After students view videos there will be asynchronous discussions via the accessible CMS Discussion Board or discussion can also be provided synchronously using accessible video conferencing tools with the CMS.

Method

Lab Activities

Integration

Hands-on laboratory investigations will be conducted to investigate the course objects such as measurements of the physical and chemical properties of seawater, invertebrate animal classification, plant pigment extraction and measurement of the absorption spectra of chlorophyll and carotene, plankton observation, identification and classification, squid dissection, and fish dissection.

DE Adaptations for MOI

Lab demonstrations are posted to the CMS via accessible images and accessible captioned videos and/or delivered live via accessible video conferencing tools. Accessible laboratory simulations may be utilized as well. Students may be asked to utilize an online interactive microscope to observe and compare different organisms or tissues. Laboratory write-ups are submitted in the CMS.

Method

Lecture

Integration

Interactive lectures with multimedia will be used to present the concepts in the learning objectives. Active learning approaches will be implemented that engage all of the students in the class. As an example, for the objective "Investigate and describe the physical and chemical properties of sea water that affect marine organisms" the chemical and physical properties of water will be discussed and the chemical bonding will be illustrated in a diagram on the board and in transparencies.

DE Adaptations for MOI

Lecture content may be provided in the CMS, asynchronously using tools such as course pages or creating accessible captioned videos. Lecture can also be provided synchronously via accessible video conferencing tools within the CMS.

Methods of Evaluation

Method

Class Participation

Integration

In-class participation by all students will be expected and assessed to create an active learning environment that helps students achieve the learning objectives. Participation points may be assessed in a number of different ways including: short written assignments, answering instructor questions, discussing out-of-class readings, iclicker®, kahoot, socrative, or other classroom quiz systems. In class participation quizzes and other learning activities may focus on the physical and chemical characteristics of the ocean, the biogeochemical cycles, the ocean ecosystems and humanities impact on these ecosystems, the classification and identification of diverse marine life, and many more topics found within the course content. All evaluation materials are college level with a variety of formats such as multiple choice, fill-in the blank or short answers and essay. Evaluation will be based on participation/completion rather than correctness of answers, allowing for formative assessment and providing students the opportunity to self-evaluate their learning/understanding of course topics. Grading will be completed within 2 weeks of the activity.

DE Adaptations for MOE

Participation may be assessed in a number of different ways in the online environment including: short written assignments using text submission assignment tool in the CMS, answering instructor questions using text submission assignment tool in the CMS, giving oral presentations using video creating tools such as Youtube or those provided in the CMS, such as Studio, and discussing out-of-class readings using the discussion board feature in the CMS, google docs, or break out rooms using a video conferencing tool. Student will receive feedback from the instructor, within 2 weeks of submission, through the CMS gradebook. Evaluation will be based on participation/completion rather than correctness of answers.

Method

Exams/Tests

Integration

Examinations to determine the students' understanding and grasp of the course content. Examinations may be multiple-choice, multiple answer, matching, labeling, true/false, short answer, long essay questions, or oral. An example question may be the following: "Evaluate the effects of overfishing of Tuna on the local ecosystem." Multiple choice, true/false, etc. style questions would be automatically graded for correctness within the CMS. Short/long essay answers or oral based exam questions would be graded by the instructor within 2 weeks and evaluation would be based on thoroughness and correctness of answers.

DE Adaptations for MOE

Examinations are presented online in the CMS and may include multiple choice, multiple answer, matching, labeling, true/false, short answer, long essay questions, or oral based questions. Oral exam answers would be submitted via studio video in the CMS or synchronously using a video conferencing platform. Multiple choice, true/false, etc. style questions would be automatically graded

for correctness within the CMS. Short/long essay answers or oral based exam questions would be graded by the instructor within 2 weeks and evaluation would be based on thoroughness and correctness of answers. There is no requirement for proctored, on campus attendance for examinations.

Method

Oral Presentation

Integration

To synthesize concepts about marine biodiversity, students will create a classification poster and they will report on marine organisms and how human activities have impacted the ecosystems of these organisms. Students will investigate how marginalized coastal populations have been impacted by the negative impact of human activities. Students may do an oral report of their poster which will include the classification, ecology, and uses of marine organisms. Evaluation of the oral presentation will be performed based on a provided rubric and will include criteria such as accuracy and appropriate level of detail, use of scientific resources, and appearance of presentation through the use of images, figures, charts etc. Feedback will be provided within 2 weeks of submission.

DE Adaptations for MOE

Oral presentations are delivered synchronously using a video conferencing program or asynchronously by posting a video as an assignment submission or discussion board post within the CMS. Evaluation of the oral presentation will be performed based on a provided rubric and will include criteria such as accuracy and appropriate level of detail, use of scientific resources, and appearance of presentation through the use of images, figures, charts etc. Feedback will be provided within 2 weeks of submission.

Method

Papers

Integration

To evaluate laboratory performance students will complete lab reports for certain experiments and lab worksheets following completion of all laboratory exercises. Students may also be required to manage and complete a laboratory notebook to record and analyze data gathered during laboratory experiments. Article summaries and essays on current topics in Marine Biology will be used to discuss current issues in Marine Biology. An example topic is: Man's Impact on the Ocean. A student may write an essay on "Marine Debris." Students will research the work of diverse scientists that have contributed to our understanding of these issues. Papers will be evaluated by the instructor within 2 weeks and will be graded for completeness, comprehension, content accuracy, and quality using the provided rubric.

DE Adaptations for MOE

Lab reports and essay papers will be turned in as an assignment in the CMS. Detailed instructions and a rubric will be provided in the CMS. Papers will be evaluated by the instructor within 2 weeks and will be graded for completeness, comprehension, content accuracy, and quality using the provided rubric.

Assignments**Assignment Type**

Writing

In-class and/or outside of class

In-class

Formative or Summative

Formative

Assignment

Evaluate unknown marine specimens in the lab to determine how to classify them into different natural groups. Construct and illustrate a classification scheme, write out a biological "key" based upon the scheme, devise a nomenclature system for naming the unknown specimens, and evaluate which specimens belong to the same "species" using observable, physical characteristics. A poster of the results of this investigation will be presented to the class. The class will discuss the diversity of marine organisms to gain an appreciation for marine ecosystems. Clear instructions for classifying the unknown organism and constructing the poster will be provided. A rubric with grading details will help guide student work. Student work will be assessed by use of course knowledge to

construct natural groups, how complete each part of the assignment is, clarity of the information in the poster presentation, use of critical thinking skills to construct the classification scheme. Projects will be graded within 2 weeks of submission and grades will be posted in the CMS.

How assignment will be adapted in online format

Pictures of unknown organisms will be provided in the CMS. A roadmap will be provided to complete the project along with poster templates and examples of student work. Rubrics showing how the work will be assessed will be provided in the CMS. The online posters will peer reviewed through the CMS. The project will be assessed based on the quality of the peer review, use of course knowledge to construct natural groups, how complete each part of the assignment is, clarity of the information in the poster presentation, use of critical thinking skills to construct the classification scheme. Projects will be graded within 2 weeks of submission and grades will be posted in the CMS.

Assignment Type

Reading

In-class and/or outside of class

In-class

Outside of class

Formative or Summative

Formative

Assignment

Read a scholarly scientific article about the Marine Life Protection Act. Critically discuss the act and how it will affect different stakeholders including native population that have historically used sustainable coastal and marine practices. Submit a short summary of what you learned in the initial discussion. You will be assigned different viewpoints related to the Marine Life Protection Act - sport fisherman, commercial fisherman, environmentalist, native fisherman or fish and game department. Identify at least two scholarly articles that support their viewpoint. Write a short argumentative essay supporting their position with a citation page. Share your viewpoints in class and summarize the pros and cons of each viewpoint together as a class. Research guidance will be provided and students will be encouraged to work with the librarians and peer tutors in the library. Follow the rubrics for the discussion participation and written work provided to guide your work. In class discussions will be graded on the number of times a student participates in the discussion and the quality of the comments provided. Research and written work will be assessed according to a provided rubric that evaluates the appropriateness and quality of the chosen articles, demonstration of critical thinking, and the quality of the argument in support of the assigned position. Grades will be posted in the CMS within 2 weeks of the submission of the short argumentative essay.

How assignment will be adapted in online format

The Marine Life Protection Act article will be provided in the CMS. Students will be assigned an initial online discussion board to present their short summary of the act and critically discuss the how the act will affect different stakeholders. Through the CMS, students will be assigned one of the differing viewpoints related to the Marine Life Protection Act to develop an argument for. Online research guidance using the library databases will be provided and students will be encouraged to work with the librarians and peer tutors in the library. A second online discussion board will provide students the opportunity to share their viewpoint argumentative essay with citations. Students will respond to the initial post with their synthesis of the viewpoints highlighting the overall pros and cons of the act. Students will receive clear instructions for the writing portions through the CMS, guidance for how to submit their writing online, and examples of good work. Rubrics for the discussion participation and written work will be provided ahead of time to guide student work. Online discussions will be graded using a rubric for the number of posts, the length of the posts, and the quality of the comments. Research and written work will be assessed according to a provided rubric like the on campus class that evaluates the appropriateness and quality of the chosen articles, demonstration of critical thinking, and the quality of the argument in support of the assigned position. Grades will be posted in the CMS within 2 weeks of the submission of the second online discussion board.

Assignment Type

Other

In-class and/or outside of class

In-class

Formative or Summative

Summative

Assignment

At least three exams will be given during the semester to assess understanding of marine biology content covered in the lecture and lab material. Examinations may include a variety of question formats such as multiple-choice, written, fill in the blank, and labeling. Exams will be assessed based on the correctness of the responses as well as the quality and thoroughness of written answers. Scores will be posted to the CMS within 2 weeks of the exam date.

How assignment will be adapted in online format

Online exams will be administered in the CMS and are not required to be proctored. Most types of exam questions can be automatically graded by the CMS based on the correctness of the responses except written responses which will be scored based on correctness of the response as well as the quality and thoroughness of written answers. Scores will be posted to the CMS within 2 weeks of the exam date.

Course Materials

Textbooks

1. Peter Castro and Michael Huber (2024). Marine Biology, 12th Edition McGraw Hill.
ISBN: 1260722198
2. Jeffrey Levinton (2021). Marine Biology, 6th Edition Oxford University Press.
ISBN: 0197543502

Other Resources

MSJC Biological Sciences Department. BIOL-130 Lab Manual 2nd Edition. Mt. San Jacinto College , 01-01-2023.

Class Size Information

Class Size

32

Class Size Category

G - Large lab 32

Diversity and Inclusion

Explain how diversity and inclusion(e.g., gender, culture/race, sexuality, etc.) is infused into the course.

While vastly underrepresented in the field; women, BIPOC, LGBTQ+, and disabled scientists have made contributions in marine biology, these scientists and their accomplishments will be highlighted within the lecture content and as the focus of an assignment. Several lecture topics and assignments in this course will bring to light many historical practices that have degraded marine and coastal environments which disproportionally, negatively impacted marginalized communities. Acknowledgment of the unethical and racist practices from the past will be made, and discussion of the ethical considerations of past and current marine conservation issues will be addressed within the lecture content and assignments.

Describe how assignments, instruction, evaluation, course content, and interactions are contextualized for diverse learners promoting an equitable course.

To support diverse learners, more emphasis has been placed on the process of learning and establishing a growth mindset, as well as the role of individual differences in the learning process. This will encourage students to have an increased self-awareness, awareness of others and to engage as individuals and value students as whole people in the learning process. Assignments show a variety of approaches to the course content utilizing a variety of sources, including written texts, popular and scientific articles, accessible videos, and websites while scaffolding approaches to help them understand the critical reading and thinking process. A variety of different types of assignments are used throughout the course and students are given many opportunities to choose the topic of focus for the assignments. The course content, objectives, methods of instruction, methods of evaluation, and assignments, allow students to interact with their instructor, and each other, while learning about real world issues, to build critical thinking skills in community and through personal interaction, in-class and out of class practice to apply skills, and to receive feedback both informally in discussions and other formative types of low stake assignments and formally through summative assessments.

Interactions

Explain how the course will incorporate student-to-student interaction.

Students will engage in a variety of collaborative activities such as break-out rooms, discussion board, or small group assignments so that students will have frequent opportunities to engage in peer-to-peer discussions designed to foster community and encourage

students to experience variant interpretations of the content under analysis. Students will also perform laboratory experiments in small groups, where cooperation and collaboration will be required to successfully perform and analyze the results of the lab experiment.

Explain how the course will incorporate instructor-to-student interaction.

The instructor will lead lectures in class or online either synchronously or asynchronously. Discussions will be conducted in person during class or through CMS discussion forums, or through breakout rooms in a video-conferencing platform. The instructor will lead and guide students through laboratory exercises and on field trips. The instructor will provide feedback to students in the CMS gradebook with regards to responses to formative assignments such as discussions and presentations, as well as provide feedback on summative assignments such as report, projects, and exams. The instructor will communicate with students in class as well as through canvas announcements, email, discussion boards, and in office hours.

Explain how the course will incorporate student-to-content interaction.

To learn critical thinking concepts and explore biological processes, the instructor will provide a variety of media for learning. Students will reference accessible and ADA compliant materials such as assigned readings (textbooks, lab manuals/exercises, articles, websites), written lecture materials or transcripts of lectures, illustrative images, charts and graphs, video or audio lectures, narrated PowerPoint presentations, embedded or linked multimedia content (such as films, YouTube videos, lab simulations, podcasts, etc.), and student created content, through presentations and discussions.

Explain how the course will incorporate student-to-self interaction (metacognitive).

Through discussions, presentations, and assignments, students will pose questions about science as well as how they approach their assignments and analysis. Through readings, lectures, activities, and discussions, students will explore connections between biological content and personal experiences, to demonstrate how science can be a vehicle for analyzing current societal and community concerns. The analytical and critical thinking skills students use in this course while analyzing scientific information have broad applications beyond the classroom. Many assignments in this course allow students to choose their own topic and to reflect on why they chose the topic, how they relate to the topic, and how they may use the newfound information to impact their lives, the lives around them, and the environment.

Key: 467