

**BIOLOGY 13.01 and 13.02 – MARINE BIOLOGY – WINTER 2011**

4 hours lecture/4 hours lab (5 units)

- Lecture in SC1102 Mon & Wed: 2:30 – 4:15 pm
- Lab in S51 Mon/Wed: 10:30 – 2:15 pm

Instructor: Jason Bram Office: Bldg. S5, Room S51a

Office Hours: Mon. 4:30-5:30, Tues. 12-1, Wed. 4:30-5:30, Thurs. 12-1  
and always by appointmentE-mail Address: [bramjason@deanza.edu](mailto:bramjason@deanza.edu)

Phone #: 408-864-8654

Instructor webpage: <http://www.deanza.edu/faculty/bramjason>Catalyst webpage: <https://catalyst.deanza.edu/>

We will be using the Catalyst webspace to take quizzes, turn in assignments, and it is a place where you can track your grade in the course and access course files like lectures and study guides.

Please let me know as soon as possible if you have any questions/problems with accessing Catalyst.

It is YOUR responsibility to check the webpage for course updates!!!

**INTRODUCTION:** Welcome to Biology 13 (Marine Biology) and the study of the wondrous array of life and adaptation in our oceans! For most students this is an astounding, interesting, sometimes awe-inspiring and hopefully quite fun view of marine biology as we know it. This 5-unit course is an introduction to the wonderful diversity of marine life on earth. The course is intended for **non-biology majors**, and my goal as your instructor is to help you achieve a good understanding of the basic principles of marine life on earth! I also hope that you will develop a lifelong appreciation of marine biology - you will see for yourself that understanding marine biology makes the world a much more interesting place!

**COURSE DESCRIPTION:** An introduction to marine biology as a branch of the biological sciences and to its basic unifying principles, with selected application to the scientific method, physical and chemical oceanography, marine animals, marine plants, and marine ecology with major emphasis on the natural history of marine life. Additionally, various oceanic habitats, such as bays estuaries, and open oceans are described.

This course satisfies the De Anza General Education Requirement in Natural Sciences and is transferable to both UC and CSU as a general education science course. This course does **NOT** apply towards a major in biology.

**ADVISORY:** English Writing 211 and Reading 211 (or Language Arts 211) or English as a Second Language 272 and 273.

**TEXT:** The **required** text is: Biology of Marine Life by John F. Morrissey and James L. Sumich Ninth edition. 2009 Jones and Bartlett Publishers. ISBN: 9780763779559. The best way to use the text is as a reference. My tests come from my lectures, so if there's a concept that I go over in lecture that you need further information on, the textbook is a great resource!

For the lab, the **required** text is Marine Biology by Jason Bram.

Both can be found at the De Anza Bookstore.

**COURSE REQUIREMENTS AND EXPECTATIONS:** You are expected to attend every class meeting. If you miss a class, it is your responsibility to obtain information and materials dispensed in that class period. Attendance, as well as participation, will be the first criteria considered when determining "borderline" grades. In my experience, those students who do not attend class are the students who do not fulfill their potential regardless of their level of understanding. Medical, legal and other scheduled appointments should not be scheduled during normal class times and these will not be considered as excused absences. Medical or personal emergencies will require a written notice of the specific problem signed by an appropriately qualified individual.

Disruptive behavior will not be permitted in lecture. The lecturer will determine what constitutes disruptive behavior at his discretion, and disruptive students may be asked to leave. Here are some general rules:

- Arrive to class on time, and do not leave early.
- No use of cell phones, MP3 players, TEXT MESSAGING, or pagers during lecture.
- Do not converse with your classmates (or yourself!) while the instructor or other presenter is addressing the class. If you have a question or discussion item, please raise your hand.
- Be respectful of your instructor, college staff, and your fellow students.

I WELCOME AND ENCOURAGE YOU TO ASK ME QUESTIONS DURING LECTURE!!! IF I DON'T KNOW THE ANSWER, I WILL FIND YOU THE ANSWER!

<b>ASSIGNMENTS</b>	<b>DATE</b>	<b>POINTS</b>
Three Lecture Exams: (non-cumulative, highest score is doubled)	Jan. 24, Feb. 23, March 23	100 pts. each
Two Lab Exams:	Jan. 31/Feb. 2, March 14/March 16	75 pts. each
Weekly Quizzes/Assignments (every week except for exam weeks)		5 pts. each (30 pts. total)
You can drop your lowest quiz/assignment grade - no makeups!!!		
Lab Assignments/Attendance:		40 pts. total
Project Presentations (group grade)		50 pts.

**670 TOTAL POINTS POSSIBLE!!!**

### **EXTRA CREDIT POINTS**

Independent Project	up to 25 pts.
Volunteering/Internship	up to 25 pts.

**Note:** Students who exceed 4 absences are not eligible for extra credit.

**GRADING:** Final letter grades shall be assigned in accordance with the following percentages:

<b>A+</b>	=	95% or higher	636 points or higher
<b>A</b>	=	91-94%	610-635
<b>A-</b>	=	88-90.9%	590-609
<b>B+</b>	=	85-87.9%	570-589
<b>B</b>	=	80-84.9%	536-569
<b>B-</b>	=	76-79.9%	509-535
<b>C+</b>	=	71-75.9%	476-508
<b>C</b>	=	63-70.9%	422-475
<b>D</b>	=	53-62.9%	355-421
<b>F</b>	=	52.9% and below	354 points or lower

Note: I do not curve the grades for the course. IT IS IN YOUR BEST INTEREST NOT TO SETTLE ON A GRADE!!! EACH OF YOU DESERVES THE BEST GRADE THAT YOU CAN ACHIEVE!!! DO NOT HESITATE TO TALK TO ME IF YOU ARE FINDING YOURSELF LOST, CONFUSED, OVERWHELMED, BORED OR SCARED ABOUT YOUR GRADE OR ANY OF THE INFORMATION PRESENTED AT THE EARLIEST POSSIBLE SIGN THAT YOU ARE HAVING DIFFICULTY.

**EXAMS:** Each of the exams will consist of a combination of multiple choice, short answer, matching, and fill-in-the-blank questions.

1. Both the lab and lecture exams will only cover the material within that time period (i.e. the 2<sup>nd</sup> lecture exam will only cover the material presented AFTER the 1<sup>st</sup> exam).
2. I will be providing reviews for the lecture exams for you to study from, but in no way are they substitutes for coming to class!!!
3. You CANNOT make up an exam!!! This is not fair to the other students.
  - a. It is my experience that certain students always seem to have emergencies come up on exam days. I have found that when I'm "nice" to students, they abuse the privilege. Please be a responsible individual!
  - b. In saying all this, if an uncontrollable emergency or personal crisis arises, I occasionally will allow make-ups for **responsible** individuals, but they are few and far between. If something does happen, let me know the situation as soon as you can, and I will be more flexible. You will need to provide some sort of proof (i.e. a doctor's note, etc.)
4. Weekly quizzes/assignments will be based on the previous' week lectures. I'm trying to ensure that you're keeping on top of things! The quizzes are open-note!!! There is ABSOLUTELY NO makeups on these - that's why I'm letting you drop your lowest score!!! There will only be quizzes/assignments on weeks where there ISN'T an exam. All exams/assignments will be completed via the Catalyst website (see above for web address) and will have strict deadlines. **If there is a problem with this, other arrangements can be made, but you will need to talk to me BEFORE the assignment/quiz in order to make other arrangements.**

**IMPORTANT NOTES REGARDING THE PROJECT PRESENTATION:** This will be a group project, and you will receive a group grade. You are required to orally present (as a group) a 7-10 minute seminar based on a topic in marine biology. The goal of this project is to help you learn both how scientific studies are conducted, as well as to learn how scientific research is presented.

The first half of your paper will be a general introduction to the topic, while the 2<sup>nd</sup> half of your paper will be summarizing a scientific journal article on your topic (I will happily help you find a journal article). Further discussions about this assignment will be covered around the middle of the semester.

### Project Presentation rubric

	Great	Good	Okay	Doesn't do it
Does the group present an introduction to their topic?	10	7	3	1
Does the group present a scientific paper based on their topic?	10	7	3	1
Does the group seem to understand what they are presenting?	10	7	3	1
Does the group effectively use visual aids (i.e. Powerpoint slides)	10	7	3	1
Overall, how did the group present their topic & scientific paper?	10	7	3	1

### IMPORTANT NOTES REGARDING THE LABORATORY ASSIGNMENTS AND THE LAB ITSELF:

No eating, drinking, smoking, or sewing (especially no sewing!) allowed in the laboratory!

You are expected to attend all labs & field trips. if more than one lab is missed without a reasonable excuse, you may be dropped from the course! If three labs are missed, you will be dropped from the course!!! This DOES NOT include field trips (see below on how to make up field trips).

if you miss a lab, you are responsible for finding out what you missed. If you miss the Monday lab, you cannot make up the lab by attending the Wednesday lab UNLESS you have cleared it with me in advance.

Grading: The labs are worth a total of 40 points. If you miss a lab or don't go on a field trip, you lose 5 points (no make-ups except for field trips - see below). There are assignments associated with each lab, and you will be turning in your lab book at the end of the quarter. YOU ARE RESPONSIBLE FOR FILLING IN THE DATA/INFO for each lab, EVEN IF YOU MISS THE LAB! If a lab is not filled out, you lose 5 points. So, you can lose 10 points for one lab if you don't attend and you don't get the data/info from a friend or me!

1. The lab tests will be based solely on the labs that we do in class/on the field trips, so it's definitely in your best interest to be there!!!

**SCHEDULE:** The following schedule may be modified during the course at my discretion.

<b>DATE</b>	<b>LECTURE TOPIC</b>	<b>LAB</b>
1/3	Course Introduction/Ocean Habitat (Chapt. 1)	Lab #1 - The Scientific Method
1/5	Patterns of Associations (Chapt. 2)	Lab #1 - The Scientific Method
1/10	Phytoplankton (Chapt. 3)	Lab #2 - Ocean Chemistry/Plankton
1/12	Phytoplankton (Chapt. 3)	Lab #2 - Ocean Chemistry/Plankton
1/17	NO CLASS!!! MLK's Birthday!	NO LAB - FIELD TRIP FREEBIE!!!
1/19	Marine Plants (Chapt. 4)	NO LAB - FIELD TRIP FREEBIE!!!
1/24	LECTURE EXAM #1 (includes material covered 1/3 - 1/19)	Lab #3 - Algae/Invertebrates
1/26	Heterotrophs/Invertebrates (Chapt. 5)	Lab #3 - Algae/Invertebrates
<b>FRIDAY, 1/28 LAB #4 - INTERTIDAL FIELD TRIP (Mon. lab) 11:30ish - 2:30ish</b>		
<b>SUNDAY, 1/30 LAB #4 - INTERTIDAL FIELD TRIP (Wed. lab) 1:30ish - 4:30ish</b>		
1/31	Heterotrophs/Invertebrates (Chapt. 5)	Lab #5 - Beach hoppers/Parasites
2/2	Marine Vertebrates (Chapt. 6)	Lab #5 - Beach hoppers/Parasites
2/7	Marine Vertebrates (Chapt. 6)	Lab Exam #1(1/3 - 1/30)Lab #6 - Vertebrates
2/9	Estuaries (Chapt. 7)	Lab Exam #1(1/3 - 1/30)Lab #6 - Vertebrates
<b>SUNDAY, 2/13 - FREE &amp; MANDATORY MONTEREY BAY AQUARIUM (Lab #7) TRIP!!! 10:00 AM</b>		
2/14	Temperate Coastal Seas (Chapt. 8)	Lab #8 - Interstitial/Marine Policy
2/16	Coral Reefs (Chapt. 9)	Lab #8 - Interstitial/Marine Policy
2/21	NO CLASS!!! Washington's Birthday!!!	NO LAB - FIELD TRIP FREEBIE!!!
2/23	LECTURE EXAM #2 (includes material covered 1/26 - 2/16)	NO LAB - FIELD TRIP FREEBIE!!!
<b>SATURDAY, 2/26 LAB #9 - SANDY BEACH/MUDFLAT FIELD TRIP (Wed. lab) 11:30ish - 2:30ish</b>		
<b>SUNDAY, 2/27 LAB #9 - SANDY BEACH/MUDFLAT FIELD TRIP (Mon. lab) 12:30ish - 3:30ish</b>		
2/28	The Open Sea (Chapt. 10)	Catch-up Lab/Review/Project Time
3/2	The Open Sea (Chapt. 10)	Catch-up Lab/Review/Project Time
3/7	The Deep Sea (Chapt. 11)	Lab #10 - Project Presentations
3/9	Birds & Mammals in Polar Seas (Chapt. 12)	Lab #10 - Project Presentations
3/14	Harvesting Marine Resources (Chapt. 13)	Lab Exam #2 (1/31 - 3/9)/Lab books due
3/16	Make-up Lecture	Lab Exam #2 (1/31 - 3/9)/Lab books due
3/21	Review	NO LAB
3/23	<b>FINAL EXAM 1:45 - 3:45 PM IN THE CLASSROOM!!!</b> (includes material covered 2/28 - 3/16)	

**FIELD TRIPS:** We will be embarking on **THREE MANDATORY FIELD TRIPS**. Believe me, they will be a lot of darn fun, so I highly encourage you to attend!!!! Why would you be taking marine biology if you're not able to go into the marine environment anyway??? However, given that they are on the weekend, if you cannot go, an alternative (and way less fun) assignment will be given to you (a 2-3 pg. summary of a scientific journal article). If you miss a field trip, **IT IS YOUR RESPONSIBILITY TO TALK TO ME TO GET THIS ALTERNATIVE ASSIGNMENT!!!** If you do not do this alternative assignment, you will not get credit for the lab. **THIS IS COLLEGE, DARN IT!!!** There is **NO COST** associated with **ANY** of the trips. Yes, I'm getting you all in the Monterey Bay Aquarium (and hopefully a behind the scenes tour) **FOR FREE!!!** However, **YOU** are responsible for

your own transportation. **MAKE FRIENDS/TRAVEL BUDDIES** in this class. We're in this together. Splitting fuel costs is a great idea!!! Don't be shy!!!

**EXTRA CREDIT:** THIS IS NOT REQUIRED!!! However, I highly suggest doing all of the extra credit or you really only have yourself to blame for not receiving the grade that you want to get in this course!

You can earn 25 points by doing one or 50 points for doing both of the following:

1. volunteering/interning somewhere biologically related - you will need to provide a letter from a supervisor (with contact info), and you must have given at least 10 hours of service in the quarter. I will pro-rate your points, so for example, if you give up 5 hours, you will receive 12.5 extra credit points. If you want suggestions, don't hesitate to ask me for them!
2. by doing an independent project. I'm leaving this somewhat up in the air. If you have an idea, I'll happily listen! I'll also give you some ideas. From doing your own experiment/sampling (this can also be done as a group), or if you want to stay in the comfort of your home, I'll provide some at-home ideas as well. I'm looking for a 5-10 hour time commitment on this project, so it won't be too taxing!

### **STUDENT LEARNING OBJECTIVES:**

1. Examine marine biology as a branch of the biological sciences and its relation to the scientific field and how the scientific method is used.
2. Assess and apply biological concepts to modern life and a technologically based society.
3. Appraise the physical and chemical properties of the ocean.
4. Examine the structure of plant and animal cells, cellular processes and organic evolution.
5. Compare and contrast the anatomy, behavior, reproduction, and ecology of selected invertebrates, vertebrates, plants, and protista.
6. Assess ethical issues and environmental effects, from local to global that surround pollution and its effects on marine animal populations, phytoplankton production, oxygen production, global warming and ozone depletion.
7. Identify major marine environmental problems that have resulted from changes in ecological relationships.
8. Summarize major changes in natural gene pools as a result of direct and indirect selection by humans.

### **EXPANDED DESCRIPTION: Content and Form**

- A. Examine marine biology as a branch of the biological sciences and its relation to the scientific field and how the scientific method is used.
  1. Analyze the characteristics of science.
  2. Formulate and solve problems utilizing the scientific method, including experimentation.
  3. Examine biological fields, including sub-disciplines with emphasis on marine biology, including career opportunities.
  4. Examine the role of science in a changing society such as significance in health fields, food industry, biotechnology and transportation.
  5. Assess the contributions to scientific studies by cultural, ethnic and gender groups.

- B. Assess and apply biological concepts to modern life and a technologically based society.
  1. Examine characteristics of life.
  2. Examine the processes that sustain life, including photosynthesis, cellular respiration, and energy flow.
  3. Compare and contrast the diversity of life on earth, including the five kingdoms of life.
  4. Integrate the diversity of life with current theories of organic evolution.
  5. Assess the impacts of our industrial society on life sustaining marine life.
- C. Appraise the physical and chemical properties of the ocean.
  1. Examination of bottom topography, including shelf, slope, trenches, and submarine volcanic islands.
  2. Compare chemical characteristics of open oceans from the surface to the bottom.
  3. Appraise chemical characteristics of estuaries, mudflats, rocky outcrops, and reefs.
  4. Assess geological settings as a home for marine life, including rocks, minerals, mud, vulcanism, sedimentation and erosion.
  5. Examine unique traits of water and its relationships to life.
  6. Compare different salts and their osmotic effects on life.
  7. Compare different ocean currents and their effects on the distribution of sediments, plants, animals, and larval forms.
  8. Examine variations in creation of waves, their movement, and their effects on plant, animal and human populations.
- D. Examine the structure of plant and animal cells, cellular processes and organic evolution.
  1. Examine cell structure and function of plants and animals.
  2. Examine cellular processes including, but not limited to: osmosis, diffusion, mitosis, meiosis, photosynthesis, respiration, and digestion.
  3. Examine organic evolution: historical background and foundations of the theory, how the theory works.
  4. Assess sexual and asexual strategies of reproduction in plants and animals.
- E. Compare and contrast the anatomy, behavior, reproduction, and ecology of selected invertebrates, vertebrates, plants, and protista.
  1. Examine plant diversity and adaptations including diatoms, red algae, green algae, blue-green algae, mangroves, cordgrass, pickleweed, and coconut trees.
  2. Examine the process of photosynthesis and efficiencies of different marine plants.
  3. Assess geographic and vertical distribution in the sea of marine plants.
  4. Assess anatomical adaptations of marine plants related to drying, radiation, reproduction and flotation.
  5. Examine uses of marine plants by different human cultures.
  6. Compare similarities and differences within the invertebrates.
  7. Compare similarities and differences within the vertebrates.
  8. Assess the development of vertebrates based on:
    - a. Importance of behavior and feeding strategies.
    - b. Variations in locomotion, social organization, and reproductive strategies.
    - c. Variations in anatomy and locomotor adaptations of vertebrates including amphibians, reptiles, birds, fish and mammals.
    - d. Geographic distribution and ecology of vertebrate animals.

- F. Assess ethical issues and environmental effects, from local to global that surround pollution and its effects on marine animal populations, phytoplankton production, oxygen production, global warming and ozone depletion.
  - 1. Assess effects of oil spills on the environment.
  - 2. Examine effects of chloroflorocarbons on the ozone layer and global warming.
  - 3. Assess effects of nuclear power wastes dumping, thermal pollution in rivers, bays, and ocean.
- G. Identify major marine environmental problems that have resulted from changes in ecological relationships.
  - 1. Examine the sea as an important source of minerals, including table salt, sulfides of metals, and manganese.
  - 2. Assess production methods of producing freshwater for drinking and irrigation.
  - 3. Examine the sea as a source of fossil fuels.
  - 4. Examine the methods of aquaculture, mariculture, and sea ranching for the production of fish and shellfish.
  - 5. Examine the causes of depletion of commercial fishes and shrimp and the brink of population collapse.
  - 6. Assess the disruption of marine ecosystems as a result of the loss of non-commercial animals from mechanized fishing technique.
- H. Summarize major changes in natural gene pools as a result of direct and indirect selection by humans.
  - 1. Assess over-fishing of major pelagic fisheries such as tuna.
  - 2. Examine collection of inshore bivalves as a non-sustainable resource.
  - 3. Examine loss of marine bird populations due to oil spills.
  - 4. Assess loss of marine mammals due to tuna nets and oil spills.

**CHEATING:** Absolutely no form of academic dishonesty or plagiarism will be tolerated. It is unethical, unfair, and a violation of your own intelligence as well as being lame, slimy, vile, and pathetic. **Anyone caught cheating will be subjected to the most severe academic penalties.**

**ESSENTIAL STUDENT MATERIALS:** Scantrons, #2 pencils, e-mail, textbook, and lab manual.

**WITHDRAWAL AND YOUR CONCERNS ABOUT YOUR GRADE:** January 8<sup>th</sup> (non-residents) or January 15<sup>th</sup> (residents) is the last day to drop the course and receive a refund. The last day to withdraw from the course (without a "W") is January 22<sup>nd</sup>. The last day to withdraw from the course without penalty (with a "W") is February 25<sup>th</sup>. IF YOU ARE CONCERNED ABOUT YOUR GRADE, PLEASE COME TALK TO ME AT THE EARLIEST POSSIBLE TIME SO THAT WE CAN DISCUSS YOUR OPTIONS. It is to your great advantage to discuss with me (I don't bite!) any problems you are having early in the quarter so that I can try and assist you as much as possible.

**IT IS YOUR RESPONSIBILITY TO OFFICIALLY WITHDRAW SO THAT YOUR TRANSCRIPT RECORD WILL NOT BE ADVERSELY AFFECTED.**



**PLEASE NOTE:** Students who are eligible for reasonable accommodations must speak with the instructor as soon as the need for accommodation is known.

**SOME EXTRA NOTES AND HINTS TO BE A SUCCESSFUL COLLEGE STUDENT (from my own experience)!**

1. **ATTEND CLASS!!!**
2. If you miss a class, get the notes from another student. If it's still unclear, then ask your professor!!!
3. Don't be afraid of a professor's office hours!
4. Don't be afraid of your professor! We are generally reasonable people! Talk to me! Ask me questions, no matter how stupid you may think they are!!!
5. Make your professor respect you!
6. Don't procrastinate!
7. Remember that in the end, it is your responsibility to understand the assignment, not for your professor to explain it better!
8. Feel free to change your major!
9. Don't give your professor attitude. Remember that even if they're the biggest jerk ever, they have the power. Think of them as your boss. If you have a disagreement, bring it up after class/in office hours.  
(See #5)
10. Remember that there is some subjectivity in determining your grade.
11. Don't let up!
12. Being a student should be your #1 priority (if possible). Think of being a student as your job. This of the college as the place that you work. Unfortunately, you don't get any wages except for the grades you receive, but in the end, those grades can lead to a much better future than a few bucks can!
13. Study on a regular basis!
14. Study in a way that's best for you, whether that be in groups, at Starbucks, in a library, cramming, whatever!!!
15. Take advantage of extra credit!
16. Take advantage of opportunities presented (i.e. review sessions/study guides)!
17. It's a competitive world. Be competitive in college! Don't settle!!!