

**Integrative Biology C100 & C215
Earth and Planetary Science C100 & C301
Geography C146 & C301**

Communicating Ocean Sciences to Informal Audiences

Spring 2011 Course Information

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Course Description: For undergraduate and graduate students interested in improving their ability to communicate their scientific knowledge by presenting science activities in a museum setting. The course will combine instruction in inquiry-based science teaching methods with an outreach practicum at the Lawrence Hall of Science. Students will practice communicating scientific knowledge, and receive mentoring on how to improve their presentations.

Prerequisites: One course in introductory biology, geology, chemistry or marine science, interest in ocean science, and enthusiasm for teaching science

Meeting Time: Fridays 9:20AM-12:15PM (9:20AM is the actual start time) at the Lawrence Hall of Science in Room 150, on C-level.

Note: Students planning to take the Hill (H) shuttle line from Hearst Mining Circle in front of Evans Hall should take the shuttle leaving at 9:10AM. The return trip leaves the Hall at 12:27PM and arrives back at the Mining Circle at 12:35PM.

**Additional Time
Commitments:**

- 2 hours observing visitor interactions with exhibits and activities in the Hall.
- 6 2-hour sessions presenting activities in the Hall. At least one session must be on a Saturday, Sunday, or holiday.
- 1 2-hour session presenting at Cal Day on Saturday April 16.

Units: 4 units

Required Texts:

Castro, P and ME Huber. Marine Biology, 8th ed. McGraw-Hill Higher Education. Text is available at the campus bookstore and other locations where textbooks are sold. Previous versions of the book are also fine. We have placed a few copies of the text on two- hour reserve at the Koshland Bioscience and Natural Resources Library located in the Valley Life Sciences Building.

Fenichel, M and HA Schweingruber. Surrounded by Science: Learning Science in Informal Environments. The National Academies Press. Text is available at the campus bookstore and Amazon.

Additional readings on learning theory will be handed out in class.

Field Trip:

A field trip to Monterey Bay Aquarium is planned for Friday April 15, 2011. More information, maps and transportation options will be provided as we get closer to the date of the field trip.

Requirements:

- Assigned readings and participation in class discussions and activities
- Completion of on-line discussions and homework assignments
- Completion of written assignments
- Observing and presenting activities at the Hall and Cal Day (with a partner)
- Development of an original hands-on science activity to use in the museum with museum visitors
- Presentations of your original hands-on science activity to the class
- Participation in peer review of presentations

Late Policy:

Late assignments will be accepted up to one week after the assignment's due date. Ten percent of the total possible score will be deducted for each day that the assignment is late. Weekend days (Saturday, Sunday) count as days.

Written Assignments:**QuickWrites – 90 points (10 each), 9 times throughout semester**

At the start of each class, you will be given 5 minutes to answer a question about the week's reading assignment. If you miss class, you will not be able to make up the QuickWrite.

Online Discussion – 100 points (10 each), 10 times throughout semester

Each week, you will participate in an online discussion. Participation is worth 10 points—5 points for making a thoughtful original comment, and 5 points for responding thoughtfully to a classmate's comment.

Informal Environments Observation Worksheet – 25 points, due January 28

Schedule a time to visit The Lawrence Hall of Science, or visit another museum, aquarium or science center (such as the California Academy of Sciences/Steinhart Aquarium, Aquarium of the Bay, or Chabot Science Center) to observe visitors and complete the worksheet, given out in class. This is an individual assignment.

Design Starter – 50 points, due February 28

You will be given a set of questions to help you and your partner design your own activity. Answer these questions in a Word document. See the [Design Starter Example](#) in the bSpace Resources section. This is a partner assignment—you and your partner will turn in identical documents via bSpace.

Content paper – 100 points, due March 11

Write a 4-page paper, double-spaced in 12-point Times New Roman font, about the science content that your activity will focus on. It is very important that the information you share with visitors is accurate—and that you can put this information in the context of larger issues of interest to the public. To ensure that you know what you're talking about, you need to do some research—on the internet, and using books and scientific journal articles. See the [Content Paper Example](#), in the bSpace Resources section. Cite a minimum of three references: two books/scientific journal articles and 1 online source from an educational institute or organization (like NOAA). See the [APA References Documentation](#) PDF, in the bSpace Resources section, for examples of how you should cite your references in this paper. Turn in via bSpace. This is an individual assignment.

Activity Write-Up, First Draft – 50 points, due March 18

This is a detailed write up of the science concepts underlying your activity, the goals and objectives of the activity, and how to implement your activity in an engaging and interactive way. You have been working on bits and pieces of this assignment throughout the semester. Use the [Activity Write-Up Template](#), in the bSpace Resources section, to guide you as you write the paper. It should be 4–5 pages, single-spaced in 12-point Times New Roman font. This is a partner assignment—you and your partner will turn in identical documents via bSpace. Please feel free to discuss your ideas with the instructors and your classmates before developing your plan. You will receive comments on this first draft, which you should incorporate in your Activity Write-Up: Final Draft.

Visitor Content Question Assignment – 10 points, due April 8

This is a 1-page paper, double-spaced in 12-point Times New Roman font, printed and turned in at the start of class, in lieu of a QuickWrite. This is an opportunity to do some research on the questions that visitors often ask as they participate in your activity. Your paper should answer the following questions: *What questions are people asking when you*

present your activity? What information do you need to answer their questions? Do some research so you can answer their questions accurately. What did you find out? Is there something you could add to your activity to help the visitors discover the answers for themselves? This is an individual assignment.

Activity Write-up, Final Draft – 175 points, due April 22

You and your partner will revise your Activity Write-Up, First Draft, using the comments that you received from the instructors. Please talk with the instructors to discuss how you can improve your paper. Use the Activity Write-Up Template, in the bSpace Resources section, to guide you as you write the paper. It should be 4–5 pages, single-spaced in 12-point Times New Roman font. This is a partner assignment—you and your partner will turn in identical documents via bSpace.

Peer Feedback Assignment – 100 points, due April 29

You will observe your peers as they present their activities during the Peer Feedback Presentation on April 22. You will observe one group very closely and assess their activity and their presentation skills using the Observation Instrument. Turn in your completed Observation Instrument in class. Write a 3-page paper, double-spaced in 12-point Times New Roman font. Use the guiding questions in the Peer Feedback Guidelines, available in the bSpace Resources section. Turn in your paper via bSpace. This is an individual assignment.

Presentations during class:**First Presentation in Class – 50 points, February 25**

You and your partner will present a trial version of your activity to your peers during class. You will be graded based on your preparedness—whether you have a well-thought-out idea for an activity and the necessary materials.

Ocean Sciences Day Presentation – 50 points, March 11

You and your partner will present your activity to visitors at The Hall—we have invited several school groups. You will be graded based on your activity and your presentation skills, using the Observation Instrument.

Peer Presentation – ungraded, April 22

You and your partner will present your activity to visitors at The Hall, while your peers assess your activity and your presentation skills using the Observation Instrument. You will also assess your peers' activities. You will complete the Peer Feedback Assignment based on your observations of your peers.

Final Presentation – 200 points, April 29

You and your partner will present your activity for the final time to visitors at The Hall. You will be graded based on your activity and your presentation skills, using the Observation Instrument.

Presentations outside of class time:

You and your partner will present at The Hall six times throughout the semester, plus once at Cal Day. You will present for a 2-hour time block between the hours of 10am–2pm on a weekday or between the hours of 10am–4pm on Saturday or Sunday. Hall staff will observe your presentations and provide feedback to improve your activity and presentation skills. You will not receive feedback from Hall staff if you present on Sundays. You must schedule your presentation times in advance using The Lawrence Hall of Science Volunteer Information Center: <https://www.volgistics.com/ex/portal.dll?FROM=11959>

You must schedule one presentation, with your partner, during each of the following weeks:

<u>Week of:</u>	<u>Activity:</u>
February 4	COSIA activity – you can choose between the activities that were modeled on the first day of class, and you will co-present with staff from the Hall.
February 18	COSIA activity
March 4 or March 11	Your own activity
March 18	Your own activity
April 1	Your own activity
April 8	Your own activity
April 15 – Cal Day	Your own activity – you will present your activity to visitors from the community at Cal Day. You will sign up for a 2-hour time block at the Valley Life Sciences Building or at McCone Hall.
April 22 (make-up if needed)	Your own activity

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Syllabus

Session	Date	Topic	Reading	Activity Design Homework	Assignments Due	Online Discussion	Presentations
			SBS: Ch. 1, Informal Environments for Learning Science, pg. 1-18.			See bSpace	
1	Jan 21	Communicating Ocean Sciences	SBS: Ch. 2, Science and Science Learning, pg. 19-34. Reader: Feynman - Amateur Scientist. MB: Deep Sea, pg. 361-381. Website: http://www.americanprogress.org/issues/2009/05/6americas.html	Informal Environments Observation Worksheet		See bSpace	
2	Jan 28	Nature of Science	Reader: Crowley - Building Islands of Expertise in Everyday Family Activity. MB: Climate Change Special Report, pg. 231-243.	Identify your partner	Informal Environments Observation Worksheet	See bSpace	
3	Feb 4	Teaching and Learning	SBS: Ch. 3, Design for Science Learning, pg. 37-62. MB: Ocean Circulation, pg. 48-55.	Questionnaire		See bSpace	COSIA activity at the Hall, with Hall staff (1)
4	Feb 11	Designing an Activity	MB: Upwelling and El Nino, pg. 350-359.	Design Starter		See bSpace	
5	Feb 18	Constructing Knowledge, Building Understanding	MB: Waves and Tides, pg. 55-62.	Content Paper	Design Starter	See bSpace	COSIA activity at the Hall (2)
6	Feb 25	In-class Presentations	SBS: Ch. 4, Learning with and from Others, pg. 63-80.			See bSpace	Own activity in class (First Presentation)
7	Mar 4	Conversations and Questions	MB: Adaptations and Evolution, pg. 78-83. Website: Understanding Evolution website, http://evolution.berkeley.edu/evolibrary/article/evo_25 through "Misconceptions about Natural Selection."	Activity Write-up, First Draft		See bSpace	Own activity at the Hall (3)

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8	Mar 11	Ocean Sciences Day	SBS: Ch. 7, Culture, Diversity and Equity, pg. 119-137. Reader: Crowley - Parents Explain More to Boys than Girls.		Content Paper	See bSpace	Own activity at the Hall (3), Own activity at Ocean Sciences Day
9	Mar 18	Inclusion			Activity Write-up, First Draft	See bSpace	Own activity at the Hall (4)
10	Mar 25	SPRING BREAK					
11	Apr 1	Inquiry and Questions	Reader: Crowley and Eberbach - From Living to Virtual: Learning from Museum Objects.	Revise Activity Write-up			Own activity at the Hall (5)
12	Apr 8	Objects	SBS: Ch 5, Interest and Motivation: Steps toward Building a Science Identity, pg 81-102 . MB: The Impact of Humans on the Marine Environment, pg. 406-423.				Own activity at the Hall (6)
13	Apr 15	Field Trip: Monterey Bay Aquarium	SBS: Ch. 6, Assessing Learning Outcomes, pg. 103-115.		Activity Write-up, Final Draft	See bSpace	
	Apr 16	CAL DAY					Own activity at Cal Day
14	Apr 22	Assessment		Peer Feedback Assignment		See bSpace	Own activity in class (Peer Feedback Presentation)
15	Apr 29	Final Presentations			Peer Feedback Assignment		Own activity in class (Final Presentation), Own activity at Hall if missed Cal Day