BISC 587: Communicating Ocean Science to Informal Audiences

Units: 4

Term—Day—Time: Spring 2024, Tues/Thurs 1 – 2:50 pm

Location: *TBA*

Instructor: Professor Jessica Parr

Office: SGM 445

Office Hours: *TBA*

Contact Info: parr@usc.edu

Course Description

Multi-instructor, interdisciplinary course focused on student awareness and improvement of cognitive processes used in research development, and best practices in communication of ocean literacy in the public sector.

Learning Objectives

Upon completion of this class students will be able to communicate difficult topics to general audiences. Students will be able to present their research to informal audiences of all ages.

Prerequisite(s):

Graduate level understanding of scientific principles. Other interested upper division undergraduate students can petition the instructor for admittance on an individual basis.

Course Notes

COSIA is a nationwide program focused on developing scientific literacy, acting through a formal national network of educators and scientists participating in this teaching/learning initiative. This course is designed using the principles and some of the curriculum from the COSIA program for graduate students in the Marine and Environmental Biology Section of the Department of Biological Sciences, Environmental Studies program, the Department of Chemistry, as well as graduate students in other fields with experience and/or fundamental knowledge science processes. Junior and Senior undergraduate students in science and engineering majors who are participating in research projects may petition for entry into the course.

The objectives of this course are to improve the ability of advanced science students to communicate their scientific knowledge to informal and formal audiences as well as to

bridge interaction between disciplines of scientists and communicators. An additional objective is to teach scientists consciousness related to how they codify research concepts, with a goal of improving the quality of their approach to scientific ideas. The curriculum facilitates these objectives using learner centered and learning by doing philosophies. Students, using their own scientific research ideas, and working with university professors and educators, will participate in, and design an activity to be implemented at an informal learning institution. In addition, students, with guidance from outside experts including the Rossier School of Education, the School of Journalism, and the Institute for Multimedia Literacy, National Geographic Society, will learn about evaluation techniques, develop appropriate short presentations (elevator talks) to address various audiences, learn how to present concepts to journalists, and learn the basics involved in combining animation and inter-media learning tools with scientific concepts to enhance communication of science to non-science and informal audiences. The course will combine instruction in inquiry-based science teaching methods with 15 hours of supervised instruction to informal audiences at the Aquarium of the Pacific in Long Beach and or the California Science Center in Los Angeles.

Students will make presentations during the class in the Aquarium of the Pacific and/or California Science Center as well as a planned communication show-case on campus. These presentations will be on research topics of their choice and will provide guidance to the class on background journal readings before their presentations. Presentations will be described in class.

Each week, one student will compile, from blackboard discussions, the journal articles assigned for the week, which are chosen from current peer review journals. Each student will present 3 articles on blackboard for review by the class.

References for readings, coordinated to weekly sessions are below, found after the syllabus. PDFs will be made available to students on the Blackboard. Student references associated with personal research will be added to blackboard as the projects develop.

Guests will include: Aquarium of the Pacific Senior Manager of Education Emily Yam, James Fawcett (USC Sea Grant-transferring research to policy), Myrna Jacobson Meyers (COSIA teacher and Biogeochemist), DJ Kast (wonderkids coordinator, Joint Educational Project (JEP), Forbes 30 under 30 award and many other USC honors), Holly Willis (Chair of Media Arts and Practice division and Director of Academic Programs at USC Institute of multimedia), Linda Chilton (Education coordinator for USC Sea Grant), David Medzerian (Sr. editor, digital media Annenberg School for Communication and Journalism), and others

Communication

Email is the easiest form of communication. Professor Parr will respond to emails within 24 hours.

Technological Proficiency and Hardware/Software Required

Blackboard will be used to share details and readings for the class. No other technological proficiency is required.

USC Technology Support Links

Zoom information for students
Blackboard help for students
Software available to USC Campus

Required Materials

Required articles will be posted on Blackboard.

TITLE: Surrounded by Science: Learning Science in Informal Environments
CITATION: Fenichel, M., and Schweingruber, H.A. (2010). Surrounded by Science: Learning Science in Informal Environments. Board on Science Education, Center for Education, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.
ONLINE: **http://www.nap.edu/catalog/12614/surrounded-by-science-learning-science-in-informal-environments**

TITLE: Ready, Set, SCIENCE! Putting Research to Work in K-8 Science Classrooms.
CITATION: Michaels, S., Shouse, A.W., and Schweingruber, H.A. (2008). Ready, Set, Science! Putting Research toWork in K-8 Science Classrooms. Board on Science Education, Center for Education, Division of Behavioral and Social Sciences and Education. Washington, DC: The National Academies Press.
ONLINE: http://www.nap.edu/catalog/11882/ready-set-science-putting-research-to-work-in-k-8

Reference texts we might suggest are found in the library as well or online. Specific scientific information is found in books, on the web and /or will be provided. Homework posted at each session is material to be known for the session following the homework.

Description and Assessment of Assignments

Participation: Reading materials will be given to students prior to class. Students will guide the class in review of articles using blackboard tools. Participation will include blackboard as well as in class discussions and attendance.

Teaching Practicum: Teaching to informal audiences at the Aquarium of the Pacific or California Science Center. This is a 15-hour commitment outside of class time.

Written Assignments: Blackboard homework discussions. Development of a lesson or presentation that can be taught in a local aquarium or presentations to other informal or

formal group, including: Lesson or research idea proposals; Written lesson/presentation plan; Lesson debrief. Assesment tool or rubric (15%)

Presentation: Oral presentation to class and review of a peer's presentations.

Grading Breakdown

Assignment	% of Grade
Participation	10
Teaching Practicum	35
Written Lesson Plan	15
Assessment Tool	15
Blackboard Discussions	5
Presentation	20
Total	100

Grading Scale

Course final grades will be determined using the following scale:

Grade	%
A	93-100
A-	90-92.9
B+	87-89.9
B	83-86.9
B-	80-82.9
C+	77-79.9
C	73-76.9
C-	70-72.9
D+	67-69.9
D	63-66.9
D-	60-62.9
F	Below 60%

Week 9 grade: We do our best to inform you on your progress in the course by assigning an approximate letter grade at the end of the ninth week. This is based on your performance in the course to date. Note: this advisory letter is no guarantee of your final grade. Final grades are assigned using the grading scale, above. You are encouraged to check your scores often in Blackboard.

Course-specific Policies (Assignment Submission, Grading Timeline, Late work, and Technology)

Written assignments will be submitted through Blackboard, instructions will be provided closer to the due dates.

Classroom norms

1. Listen actively and attentively.

2. Be courteous. Don't interrupt or engage in private conversations while others are speaking.
3. Ask for clarification if you are confused.

Course evaluation

Students will submit confidential course evaluations, available online during week 13. More information will be provided in lecture.

Course Schedule: A Weekly Breakdown

Date	Class Description	Leader
Tuesday 1/9	**An Introduction to the Toolbox of Learning and Communication.** Introduction and logistics of the course, who are we, what do we expect etc. Discussion in class: we will review homework readings due. Intro of how we do this course.	Professor Parr
Thursday 1/12	**Theory development and challenge: The Nature and Practice of Science**. What is Science, What is not Science, What Seems like Science and is not? Hands on games facilitate the class (MT). Through interactive presentation and game (Sorting Strips, Mystery Tubes) students will inspect the philosophical underpinnings related to how we define science in our society.	Professor Parr
Tuesday 1/16	**Theory development and challenge: Teaching and Learning** - Styles of Communication: Go to the Aquarium or to the California Science Center to observe learning in an informal learning space for at least **an hour**. Write down what you see: people interacting with exhibits, people interacting within a group, and people interacting with a facilitator (staff member). This may include learners interacting with objects, with people, and with animals.	
Thursday 1/18	**Setting the Stage: Learning Outcomes and Metrics**. Debrief last week's assignment, where you observed learning in informal science centers. Continue with discussion of observable behaviors, learning outcomes, metrics, and tools needed to facilitate learning through "mountain building" exercise.	Emily Yam
Tuesday 1/23	**Theory development and challenge: Teaching and Learning.** Styles of Communicating in Lecture, Useful Methods. How can we best present content rich information to various audience types? How can I tell if the audience understands? ("questions and conversations	Professor Parr

	"Skits, role play activity will address a few modes of learning.)	
Thursday 1/24	**Theory development and challenge: Teaching and Learning.** Generated by professionals at the Lawrence Hall of Science, inquiry-based "play" station (using ice cubes) is used to discuss how we access prior knowledge and learn.	Professor Parr
Tuesday 1/30	**2/2 Theory development and challenge: Activity Design, Experimental Design** Designing a presentation, designing an activity, designing an experiment, designing a research topic.	DJ Kast
Thursday 2/1	**Theory development and challenge: Constructivism-Building knowledge**. This session focuses on how learners build an understanding of the world of them, the role of prior knowledge in building understanding, and the implications of these ideas of how we teach. Activity – moon balls.	Professor Parr
Tuesday 2/6	**Theory development and challenge: Inquiring Minds**. Movie Minds of Our Own, discussion of learning theory.	Linda Chilton
Thursday 2/8	**Theory development and challenge: Learning Conversations.** This session focuses on conversations and questions, and the key role they play in facilitating and meaning-making of ideas and concepts for learners. We'll be examining questioning strategies, patterns of talk. Then we'll introduce elevator talks by hearing from the Turbo Entabulator.	Dave Bader
Tuesday 2/13	**Theory development and challenge: Brain and Behavior Educational theory and the Brain**. In this session, we'll learn more about how physiology and learning connect through brain behavior. We will discuss the read articles from the Wall Street Journal editorial page, and discuss emotional vs rational presentations and learning. Emotion, Visual system, etc.	Professor Parr and Myrna
Thursday 2/15	**Applications and Practice: Tools.** Concept mapping: tools for research, thinking, writing, and speaking. Concept mapping allows communicators to graphically show and understand how specific concepts connect with one another as you prepare to discuss these ideas with different audiences.	Professor Parr
Tuesday 2/20	**Applications and Practice: Interactive Media Lab**. Multimedia tools - U Tube, Second life, Web page design, Inter media Department. Focusing on U Tube and other communication media, we will begin to create Design projects related to our research, web pages etc. Staff	Professor Parr

	member of IML will be guiding us as well as showing us a range of projects that embody scholarly multimedia	
Thursday 2/22	**Applications and Practice: Tools. Exhibit design, development, and evaluation.** How do we properly design etc. and evaluate success? Why are games used in STEM learning? A critical conversation In this interactive presentation, we will examine why games are being increasingly leveraged in the education sector, and identify criteria for the effective use of this games for STEM learning and engagement.	Emily Yam
Tuesday 2/27	**/7 Applications and Practice: Workshop Activities.** We will spend time workshopping your proposed projects in class. Please come prepared with rapid prototypes, etc. so that we can talk through your ideas.	Professor Parr
Thursday 2/29	**Applications and Practice: Public speaking** The most important talk you will ever give.	Frank Corsetti
Tuesday 3/5	**Applications and Practice: Storytelling and Communication.** Using Documentary and Animation	Sheila Sofia
Thursday 3/7	**Applications and Practice Inclusive Learning Environments culture, prior knowledge and Storytelling.** Addressing the needs of all learners necessarily means creating more inclusive environments. We will hear from an expert in this area, and consider how to make experiences accessible to more people.	Emily Yam
Tuesday 3/12	**No Classes – Spring Recess**	
Thursday 3/14	**No Classes – Spring Recess**	
Tuesday 3/19	**Applications and Practice: Body Language, (1 hr) Beliefs and Learning (1 hr).** What can we really tell from body language and other non verbal and verbal cues. What is Knowledge, what is Belief, what is the intersection, how can we deconstruct this to enable the best outcomes.	Professor Parr and Myrna
Thursday 3/21	**Applications and Practice: Elevator talks.** Using metaphor in learning application. Revisit learning cycle and see its applications in your elevator talk.	Dave Bader
Tuesday 3/26	**Communicating Controversy.** The next few sessions will deal with first theory and then application on presenting new and controversial topics, using both student chosen topics and the current climate and ocean acidification knowledge, other controversial topics.	Linda Chilton
Thursday 3/28	**Applications and Practice: Framing Misinformation and Culture.** Increasingly, social science has been used to inform communicators on best practices in talking about climate	Linda Chilton

	change. First, effective communications orient the public to values so that they understand why climate change is important. Second, the root cause of climate change is unclear to the public. Well-tested metaphors and explanatory chains connect people to the mechanisms of climate change. Lastly, providing community-level solutions can empower people to act in meaningful and productive ways. We will examine these strategies in this class and practice using these elements in communications.	
Tuesday 4/2	**Applications and Practice: Navigating from Science to Policy**. This session will focus on an overview of an emerging topics in science that will help illustrate how science traverses through sociology to politics.	James Fawcett
Thursday 4/4	**Applications and Practice: Continuation of Framing.** Discussion of using toys to teach science to children.	Fred Freking
Tuesday 4/9	**Applications and Practice:** Writing for Science, USC writing program. Develop science-writing techniques.	TBD
Thursday 4/11	**Applications and Practice: Navigating from Science to the Media.** How to talk to a Journalist, developing journalistic perspective.	David Medzerian
Tuesday 4/16	**Applications and Practice: Tools to communicate** Further work on your animation from Session with Cinema group	Professor Parr
Thursday 4/18	**Workshop**	
Tuesday 4/23	**Workshop**	
Thurday 4/25	**Presentation and Critique**	Professor Parr

Statement on Academic Conduct and Support Systems

Academic Conduct:

Plagiarism – presenting someone else's ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Part B, Section 11, "Behavior Violating University Standards" policy.usc.edu/scampus-part-b. Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on Research and Scholarship Misconduct.

Students and Disability Accommodations:

USC welcomes students with disabilities into all of the University's educational programs. The Office of Student Accessibility Services (OSAS) is responsible for the determination of appropriate accommodations for students who encounter disability-related barriers. Once a student has completed the OSAS process (registration, initial appointment, and submitted documentation) and accommodations are determined to be reasonable and appropriate, a Letter of Accommodation (LOA) will be available to generate for each course. The LOA must be given to each course instructor by the student and followed up with a discussion. This should be done as early in the semester as possible as accommodations are not retroactive. More information can be found at osas.usc.edu. You may contact OSAS at (213) 740-0776 or via email at osasfrontdesk@usc.edu.

Support Systems:

Counseling and Mental Health - (213) 740-9355 – 24/7 on call
studenthealth.usc.edu/counseling
Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.
National Suicide Prevention Lifeline - 1 (800) 273-8255 – 24/7 on call
suicidepreventionlifeline.org
Free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.
Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-9355(WELL), press "0" after hours – 24/7 on call
studenthealth.usc.edu/sexual-assault
Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

Office for Equity, Equal Opportunity, and Title IX (EEO-TIX) - (213) 740-5086
eeotix.usc.edu
Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

Reporting Incidents of Bias or Harassment - (213) 740-5086 or (213) 821-8298
usc-advocate.symplicity.com/care_report
Avenue to report incidents of bias, hate crimes, and microaggressions to the Office for Equity, Equal Opportunity, and Title for appropriate investigation, supportive measures, and response.

The Office of Student Accessibility Services (OSAS) - (213) 740-0776
osas.usc.edu
OSAS ensures equal access for students with disabilities through providing academic accommodations and auxiliary aids in accordance with federal laws and university policy.
USC Campus Support and Intervention - (213) 821-4710
campussupport.usc.edu
Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

Diversity, Equity and Inclusion - (213) 740-2101
diversity.usc.edu
Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

USC Emergency - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call
dps.usc.edu, emergency.usc.edu
Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

USC Department of Public Safety - UPC: (213) 740-6000, HSC: (323) 442-120 – 24/7 on call
dps.usc.edu
Non-emergency assistance or information.

Office of the Ombuds - (213) 821-9556 (UPC) / (323-442-0382 (HSC)
ombuds.usc.edu
A safe and confidential place to share your USC-related issues with a University Ombuds who will work with you to explore options or paths to manage your concern.

*Occupational Therapy Faculty Practice - (323) 442-33*40 or otfp@med.usc.edu
chan.usc.edu/otfp
Confidential Lifestyle Redesign services for USC students to support health promoting habits and routines that enhance quality of life and academic performance.