

**Graduate and Advanced Undergraduate Course
BIO 5710 and BIO 3710**

“Biology, Society, and Public Engagement”

T,Th 10:45am-12:45pm; 3 credits; FASB 250

Course Description

The relationships between society and science – particularly biology - bear on some of the most pressing issues facing the human condition today. The goal of this course is to provide students with a broad background in the process and practice of biology to better understand how advancements in our discipline affect society today; how biology is communicated to scientists and non-scientists; and how society affects the study of biology. The backbone of the course is the scientific method approach to problem solving, the ability to understand and interpret data, and the notion of how curiosity and creativity shape biological research and inquiry. The disciplinary emphasis is on biology and the environmental sciences.

The course centers on critical and integrative thinking and how this is communicated to non-scientists, particularly those who are unengaged with the biological sciences, including historical, sociological, ethical, and aesthetic perspectives. Questions addressed will include: How do biological ideas become knowledge? What roles does biology play in our culture, and how is biology related to other social institutions and practices? How might biologists link their research and the values of their research to other societal values? How might other ways of knowing and understanding inform the study of biology?

There is an increasing emphasis on the relevance of what a biologist does and how we impact society in general. For example, NSF now requires a “Broader Impacts” statement in grant proposals and explicit plans for how these kinds of activities will be accomplished. This course will explore ways in which scientists – and class participants - can increase impacts to society at large and to particular segments of the public, with special attention to community engaged learning processes and practices

Learning goals

Participants will learn about the history of the relationship of the biological sciences and society, and the theory, relevance, and best practices of public engagement with biology through a participatory blended learning environment. Specific learning goals include:

- Understand the reciprocal relationship between biology and societies (local, regional, national and global).
- Demonstrate the ability to formulate, communicate and defend well-informed views of their own concerning the issues studied.
- Carry out activities with community partners that demonstrate their ability to engage a public audience with a facet of discovery in biology, and why it is important in a community engaged setting

Modes of Learning

The course has a seminar-discussion format. Students will engage in active participation and dialogue via blended learning. The class is organized in three parts: 1) the Instructor and invited (several remote) speakers will present lectures and guided discussions, with accompanying advanced readings from the primary literature; 2) students will work in small groups to examine a current scientific issue and/or controversy concerning biology, and then produce a paper, website, and/or oral presentation that presents how this problem impacts

and is affected by the biological sciences; 3) the instructor will present communication skills workshops that lead to students choosing an appropriate community partner(s) to engage and use relevant media that concerns their own dissertation research (or the research of their lab), providing experiential opportunities to both fill the needs and meet the interests of community partners and to train students to create effective Broader Impacts. A unifying mode of learning will be the reflection assignments (discussions and written reflection essays) that will place this work in the context of community engaged learning.

Intended participants:

- Graduate students from any area of biology emphasizing (but not limited to) botany, entomology, ecology, wildlife, zoology, and science education.
- Advanced undergraduates from biology and related fields
- Instructors and invited speakers; remote participants (via Skype)

Teaching Team: Faculty: Nalini Nadkarni, Department of Biology, ASB 403, University of Utah, Salt Lake City, 84103; (360) 870 6632; Nalini.nadkarni@utah.edu; Jordan Herman, Graduate Student Teaching Assistant, Biology Department, jordan.m.her@gmail.com; and CEL Coordinator, Amy Sibul, Biology Department, amy.sibul@utah.edu.

Course prerequisites: Graduate student status (advanced undergraduates with instructors' permission)

Class size: limited to 35 registered students

Readings and assignments

Textbooks:

- R. Holliman, E. Whitelegg, E. Scanlon, S. Smidt, and J. Thomas. 2008. *Investigating communication in the information age: implications for public engagement and popular media*. Oxford Univ. Press.
- L. Bowater & K. Yeoman. 2013. *Science communication: a practical guide for scientists*. Wiley-Blackwell.

In addition, weekly assignments include readings, mostly from the primary literature, web research, on-line dialog, and class discussion/presentations.

Evaluation

The final course grade will be based on:

- (1) In-class participation, including submitting written questions and leading discussions of assigned readings (35% for 3000 level; 30% for 5000 level)
- (2) development and presentation of a Broader Impacts plan related to biology research in the student's lab or area of interest (20%)
- (3) a group project on a science communication controversy, to be developed during the semester resulting in oral presentations, assessments of impacts, and individual written reports (the latter for 5000 level) (20%)
- (4) literature search/review paper on a topic related to public engagement of biology (5000 level only) (5%)
- (5) CEL reflection discussions and final essay (10%)
- (6) Written final exam (15%)

Note that this class is offered at two distinct levels: a) the 5000 level is for graduate students and advanced undergraduate students, and b) the 3000 level is for other undergraduate

students. Students at the 5000 level will be responsible for carrying out additional assignments to demonstrate their advanced ability to comprehend and communicate the topics presented; this will include an in-depth individual report for the group project writing assignment; evidence of leadership in group project; and a literature search/review paper on a topic relating to public engagement of biology.

Class Topics and Activities

Week	Tuesday	Thursday
1	12-Jan Intro: what is science, Why public engagement? NN	14-Jan History of Public Engagement of Science - NN
2	19-Jan Public perception of science & minorities in PES - NN	21-Jan Evaluation & Assessment - CTLE/COEducation
3	26-Jan Community Engaged Learning - Amy Sibul	28-Jan citizen science
4	2 Feb Case study 1 - Sage grouse - NN and TNC	4-Feb Panel 1 - Community groups- Rosey Hunter
5	9-Feb Skills workshop - Jordan Herman	2/11/2014 CEL reflections discussion – context for communication events
6	16-Feb Case study 3 – Students?	18-Feb Panel 3 -Panel - Policy and lawmakers
7	23-Feb Panel 2- Informal Science Education (museum, zoo, gardens)	25-Feb Skills 1 - messaging and ID audience - NN
8	1-Mar Skills 2 - written materials - Joe Rojas	3-Mar Skills 3 - oral presentations, Salt Lake Acting Co.
9	8-Mar Skills 4 - social media - make website	10-Mar Group proposals - brainstorm, iD audience
10	3/15 spring break	3/17/2014 spring break
11	22-Mar Proposal round table - mini-presentations to class	24 Mar Group work
12	29 Mar Prep presentations	31 Mar Presentations to community
13	5-Apr Presentations to community	7 Apr Presentations to class
14	12-Apr Presentation to class	14-Apr Reflections on skills and Prep TGIF
15	19-Apr	21-Apr

CEL Reflections and Eval of course
16 4/26/2014 last day of classes

Final exam