EBIO 33b Citizen Science: Bridging Science, Education and Advocacy -Spring 2016

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Course Description:
Citizen science is the public generation of scientific knowledge. What the public and scientists do with this knowledge, can take several different paths: research, advocacy, collaborative study, and/or education. This course introduces students to the growing field of citizen science. The integration of technology in modern citizen science research makes this topic a natural one for a blended online course structure. Much of our focus this semester is on citizen science projects from an ecological and natural history research perspective. Work will be completed online and complemented with weekly recitations featuring hands-on activities, conversations with citizen science and education practitioners (e.g. practitioners from Museum of Science, National Geographic, the USA National Phenology Network, local public schools and others) and faculty-facilitated sessions.

Public participation in scientific research (PPSR) will form the primary tool for examining how research, scientific literacy and education projects are complementary. Students will explore citizen science from both practical (through participation in a national online project) and theoretical lenses (through the primary literature). Through experiential learning students will critically assess the collection of data by the public and participate in the scientific process.

Prerequisites and Audience (a.k.a. Who should take this course?):
There are no prerequisites for this course. The course is open to students from any discipline but priority is given to students in the Biology Major, the Environmental Studies Program, and the Education Program (including teaching candidates in early childhood, elementary, and secondary certification tracks).

Communication and Office Hours:
- Most of our communication will take place electronically through email or LATTE.
- Office hours will be announced during the first week of classes and appointments may be scheduled and held either face-to-face or virtually.

Learning Objectives:
By the end of the semester you will know or be able to (Content Knowledge):
- Explain, define and provide contemporary and historic examples of citizen science research.
- Define the components and purposes of citizen science research.
- Identify the parallels between the practice of citizen science and learning.
- How to integrate citizen science research, citizen science education and citizen science advocacy into your everyday life.
- The purpose and application of Understanding by Design framework for identifying and publicizing project goals.
Learning Objectives (continued):
By the end of the semester you will be able to (Skills):

- Participate in authentic citizen science research and explore applications in education, advocacy and further related science research.
- Analyze and critique how citizen science is shaping research, education, and advocacy.
- Identify and critique the potential of citizen science as a tool for increasing scientific literacy in both a formal and informal setting.
- Engage in 21st century learning (i.e. online learning platforms and other digital technology).
- Apply educational and scientific theory to analyze an existing citizen science research programs and work directly with practitioners in the field.
- Translate scientific research across scales and from the traditional research models to citizen science models and vice versa.
- Create related educational, advocacy and/or research products related to existing citizen science research programs.

Evaluation:

- Online Learning (Engagement and Participation in Online Learning Community) (Includes online digital work and other related products) 35%
- Recitations (Includes preparation, participation, activities and work) 15%
- Semester-long Project 35%
- Citizen Science Research Project (participation and assignments) 15%

Total 100%

Course Components:
1. Online Learning: This course will require student’s mastery of our online learning platform. Much of our work will be dependent upon the active participation of students in our facilitated discussions and online activities. The majority of our course materials will be distributed electronically, students are encouraged to develop and hone their electronic organizational skills. Topics will generally be completed in a 7-day period with set open and closing times for discussions and other activities to be completed in our online learning environment. You can expect recitation each week to consist of a short bridge period that will connect our online learning with face-to-face collaboration.

2. Recitations: The online course will be complemented with a series of face-to-face weekly recitations. Recitations will be a combination of hands-on laboratory experiences (practicing field or research techniques) and facilitated group project work with course faculty to synthesize student final projects (see below). Facilitated discussions by both formal and informal science educators and citizen science practitioners (to showcase projects, techniques or topics) will also be featured. These will be periods of expert demonstration, guided practice, and explorations of pathways to career development.

3. Semester-long Project: Students will be required to develop a collaborative final project drawing upon their major/minor expertise. These projects will be practical application of citizen science theory along the three main themes of the course: science, education and advocacy. Students will work directly with citizen science practitioners at a citizen science program outside the university.

4. Citizen Science Research Project (Experiential Learning): EBIO33b engages students with the practices of scientists and professionals engaged in education and advocacy. The course structure embeds opportunity for students to use weekly discussions to follow the unpredictable nature of scientific data collection. Participation in a national citizen science research campaign will provide opportunity for students to become citizen scientists and examine topics from a participant perspective as well. Finally, group projects and research teach students the potential impact of citizen science and education students will learn how to craft curriculum that turns inquiry into action.
**Reflective Practices:**
In this course, time is reserved to reflect upon learning; both the process of learning to learn and the process of learning to be a citizen scientist. EBIO33b is designed using backwards planning, a process wherein a set of essential questions as well as content and skill objectives are identified before weekly lectures/activities are designed. Students will be asked to reflect upon how they learn, how self-analysis can impact one’s learning and the how reflection assists in analyzing, evaluating, and augmenting existing citizen science research projects.

Through regular reflections, students will learn how specialists and regular people alike can make change. In the process of participating in citizen science, students will regularly reflect on the powerful societal impact that is possible via collaboration with concerted focus on cause. For educators and scientists alike, learning the process and product of citizen science is a model for engaging citizens (young and old) toward a life long learning for purpose and with passion.

**Success in this 4 credit hour blended course is based on the expectation that students will spend 2-3 hours per week actively engaged in our online learning classroom. Weekly recitations (2 hr) will complement the online classroom. In addition, students are expected to spend 8 hours of study time per week in preparation for time spent engaged in online activities or in preparation for recitation (readings, semester-long project, other class products, etc.).**

**Resources (readings and other sources):**
The field of citizen science is undergoing a revolution as modern day tools and social networking facilitate a boom in its growth. As such, this course will curate and draw upon a variety of sources including readings from both the primary and lay literature, excerpts from textbook, and other high quality and vetted digital resources (i.e. multimedia, conference proceedings, scientific posters, presentations, etc). A complete list of resources will be found in our online environment and each week’s references will be posted.

**Privacy:** This class requires the use of tools that may disclose your coursework and identity to parties outside the class. To protect your privacy you may choose to use a pseudonym/alias rather than your name in submitting such work. You must share the pseudonym/alias with us.

**Accommodations:** If you are a student with a documented disability on record at Brandeis University and wish to have a reasonable accommodation made for you in this class, please consult us immediately.

**Academic Integrity:** You are expected to be familiar with, and to follow, the University’s policies on academic integrity. Please consult Brandeis University Rights and Responsibilities for all policies and procedures. All policies related to academic integrity apply to in-class and take home projects, assignments, exams, and quizzes. Students may only collaborate on assignments with permission from the instructors. Allegations of alleged academic dishonesty will be forwarded to the Director of Academic Integrity. Sanctions for academic dishonesty can include failing grades and/or suspension from the university.