

IB 492 - Science Communication Skills

CRN 64406

2 hr credit

3:00-4:50 pm Thursday, 2090 Natural History Building

Contact Information

Instructor: Sydney Cameron

Department of Entomology

Office: 215 Morrill Hall

Office Hours: by appointment

E-mail: sacamero@illinois.edu

Office Phone: 333-2340

Prerequisite: Advanced Composition credit in either IB 203 or IB 271, AND one of the following: IB 299, IB 390, IB 490; *restricted to juniors and seniors, or consent of instructor*

Course Description

General: A successful career in scientific research, teaching and service requires tools and skills for communicating research. Students interested in going into science careers need to know how to write a competitive graduate school or job application, a thesis proposal for graduate research, a fellowship or grant proposal, and how to give a good scientific presentation. This course is designed to teach students these skills with targeted in and out of class exercises.

We will learn some of the questions, tools and skills required to transition from undergraduate with some research experience to advanced undergraduate ready for graduate school or a job in science. **We will examine short term issues**, such as what questions to consider before or when applying to grad school/a job, how to write a competitive application, how to keep up on the scientific literature in your area (s) of interest; **medium term issues** include planning a thesis project and how to write a thesis proposal, for an undergrad project or when in grad school; knowing where the money comes from for research and the basics of good grant proposal writing, how to read a scientific paper and the structure for writing one; how to give a presentation. We will cover **longer term issues** as we go along, including what happens after graduate school (applying for postdocs/ jobs), what kind of career you want and how to get there, and what career conflicts might arise. Other topics include handling scientific collaborations and ethics in science. Emphasis is on acquiring basic skills (emphasis on concise, logical writing) required to embark on a successful career in science.

Options for Learned Skills - skills tailored to student interest

- How to make informed decisions about the next steps in your career development
- How to develop scholarship by using the scientific literature effectively
- How to write a convincing job application for an assistantship (CV and letter)
- How to conceive, plan and write a research proposal
- How to write a proposal for a graduate fellowship (NSF Graduate Research Fellowship)
- The methods of scientific writing and presentations
- To assess your talents, skills, and career ambitions to implement a fulfilling career in science

Shared Learning

Students are not born knowing what skills and tools are necessary to become a successful research scientist. There is an important need, therefore, for advanced undergraduates interested in scientific careers in biology to develop key proficiencies required for transitioning to a higher degree (masters or PhD) program in biology or to a technical job in biology. The goals of this course are to demystify the process of becoming a scientist and to develop lifelong skills that will continue to be important to your success, even as the fickle nature of scientific fields and approaches may change radically during the course of a career.

The history and process of doing science is a shared, collaborative venture. So the course will be shaped by your specific needs, interests and questions. The learning will be collaborative even while you complete the exercises individually. We will all be critics and supporters of one another's thinking, writing and presentation skills. *The course is designed to have flexible content to consider the needs and desires of the students.*

To enhance shared learning, many of the activities and course content will be presented in the classroom, often as a discussion requiring input from everyone. Students will review and critique one another's writing projects, talks, and proposals. You will also obtain information from online sources and will work on exercises at home on your own, and sometimes in groups, depending on how you learn best. The required textbook (see below) is an excellent reference and will be useful long after you graduate and enter graduate school. The text emphasizes the process of scientific investigation, with large sections devoted to statistical analysis tools and testing hypotheses. Our assigned readings will focus on asking scientific questions and formulating testable hypotheses.

Learn by Doing

Learning will be hands-on. Depending on the breadth of interests and experience of students in the class, you will write your own job applications (e.g., for field assistant or research technician) to gain experience before grad school, possibly write your own statement of purpose to accompany a future grad school application. The course will provide you with the opportunity to learn and to hone your skills as a future scientist, how to formulate a scientific research question, to read critically, and to write and present scientific research to an audience. You will also learn how you can expect to support your research and what underlies a good grant proposal and a good job talk. This is a course for students to learn the value of peer relationships and how to give constructive peer review of fellow student's projects, as is expected in an actual laboratory with diverse students. Self-evaluation is also possible through videotaping student performances during talks or poster presentations.

Learning to think critically and to challenge entrenched ideas in a scientific field moves scientific knowledge ahead. Also, in an age when media journalism (TV, web news, blogs, magazines) has wide influence over what citizens learn about science, learning how to evaluate popular science accounts of research is necessary for challenging/encouraging rigor and honesty in the general press.

Who needs the course?

Students interested in this course are serious about going into science as a career, whether in academia, government, an NGO, industry, or perhaps consulting. You may have a smattering of knowledge about your interests and skills, scientific writing, giving a talk, organizing the literature, finding opportunities, job interviews, etc., but my assumption is that you need to advance to a more professional level in these things to compete for positions in graduate school or for jobs in the short

term and to make decisions in the long term. You will consider many of these aspects of becoming an informed scientist in the course.

There is no IB course currently offered on this subject, which will provide the students with much needed communication skills for moving to the next stage in development of a career in science, which could include graduate school, industry or a government position. The communication skills taught in this course must be learned explicitly by students before graduating to maximize their career development success in a science field. This course is a good segue from previous courses in Advanced Composition credit received from taking either IB 203 or IB 271, or any course in which students are required to write and/or present results from a research project.

Textbook (none required)

Assignments (subject to change depending on student needs)

Assignments	Percent Grade
Exercises	Total 70%
1. CV & Job Letter (2 classes)	15%
2. Personal Statement (3 classes)	22.5%
3. E-mail to Prospective Mentor (1 class)	7.5%
4. Mock Interviews (1 class)	15%
5. Discussing a Scientific Paper	10%
Presence and Participation	Total 30%
	100%

Assessment

Exercises (70%): Grade based on each exercise completed, corrected & final thumbs up on each.

Presence and Participation (30%): This is a major portion of the grade because the class is run basically like a workshop—everyone will learn from everyone else. Your peers will often be your critics (in particular, during the mock interviews and presentations of a scientific paper) and you will be theirs. If everyone works together, then by the end of class you will all have advanced to a level that will allow you to transition toward becoming a successful scientist. Importantly, your experience and input will be a valuable part of the class. I will tailor the class to the needs of the group, of which you are a participant. Your feedback is a vital part of your own, the other student's and my learning process. This should be a fun part of the course, and it will provide you with valuable skills for contributing to scientific discussions down the road.

Participation includes showing up (!), participating in class discussion—giving your feedback on other student's exercises/projects, filling out evaluation forms with thoughtful and constructive feedback, bringing in questions for class discussion. I will follow your participation frequency in all activities so that by the end of the course, I will be able to assign you a quantitative score.

Academic Integrity

This course assumes that all students will abide by the policies of honesty and integrity, which is fundamental to the process of teaching and learning. The university and this class assumes that you will pursue all assignments with personal integrity so that we can maintain an environment in which all can succeed via their own efforts.

Disability

If any student anticipates or experiences barriers to learning or full participation in this course based on a physical, learning, or mental health disability, please contact the instructor immediately to discuss possible accommodations.

IB 492 A SP19: Science Communication Skills (Cameron, S)

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January 17 (Th) - Course Description

January 24 (Th) - Job Applications

January 31 (Th) - Job Applications Draft 2

We will continue to work on the job application package in class, including your cover letter and CV. We will use breakaway groups for sharing in the constructive critique of one another's written materials.

February 7 (Th) - Mastering the Scientific Literature- guest lec Kelli Trei



February 14 (Th) - Personal Statement

We will begin class by considering what you intend to pursue that would require you to write a Personal Statement. We will discuss some of the characteristics of a good personal statement and go over some samples that have been successful in the application process. You will carry the writing of this exercise through at least 2 drafts, or until your statement is suitable to your needs (graduate or medical school application, job application or other purpose).

February 21 (Th) - Revising Personal Statement- Draft 2

You will work on revising Draft 1 of your Personal Statements in class, using the PS-1 color-coded sample on moodle to color code the main functions of key sentences and paragraphs in your own statements. You will share your work with others in class for constructive input. Melissa Wasson and Gabriel Lira will oversee class during my absence.

February 28 (Th) - Revising Personal Statement- Draft 3

We will continue with in class exercises to complete the last draft (draft 3) of your personal statement

March 7 (Th) - What Can You Do With a BS Degree Besides Grad and Med School?

Someone representing the Alumni Mentoring Program, School of Integrative Biology, will be in class to explore with you a variety of non-traditional career avenues for SIB majors.

March 14 (Th) - Writing E-mail Inquiry- What to Consider When Applying to Grad/Medical School

In class you will compose an email message to a prospective grad school or medical school advisor, or other, and send it off by the end of class.



March 21 (Th)

The week after you return from Spring Break we will have mock interviews for graduate school or medical school, or a job interview. Please email me about which of these interview possibilities you wish to set up. To prepare for these interviews we will discuss various issues during class following Spring Break. But please read this material during your break so that we can begin the process.

Spring Break

March 28 (Th) - Preparing for Mock Interviews

April 4 (Th) - Mock Interviews 1

The first set of mock interviews will involve students interested in attending graduate school. We will have three faculty from SIB who will serve as interviewers for one-on-one interviews during the first hour of class. The second hour will be devoted to individual student sharing of their interview experience, with additional input from faculty during a question/answer session.

April 11 (Th) - Mock Interviews- 2

The second round of mock interviews will include the students interested in attending medical school. We will have faculty from both the University of Illinois College of Medicine at Urbana-Champaign and MCB who will serve as interviewers for one-on-one interviews during the first hour of class. The second hour will be devoted to individual student sharing of their interview experience, with additional input from faculty during a question/answer session.



April 18 (Th) - Leading Discussion of a Scientific Publication

See Instructions file for detailed instructions on what we will be doing in class, namely dividing into 2 groups to discuss two scientific papers on the controversial topic of pesticide effects on pollinators.

April 25 (Th) - Ethics of Scientific Collaborations

NAVIGATION

SEARCH FORUMS

UPCOMING EVENTS

You are logged in as **Sydney Cameron**: Student (**Return to my normal role**)
Home

