Why teach this course?

**Communicating effectively is an essential scientific skill but rarely explicitly taught.** Scientists must tell people about their work—their colleagues, the broader scientific community, students and the general public. In an interdisciplinary field such as systems biology, scientists also face communications challenges because of their colleagues come from a wide variety of scientific backgrounds. Effective communication acknowledges that audiences have different perspectives and different goals for learning about science, and therefore benefits from a specific message tailored to them. Not only must scientists tailor their message, they must also deliver it in a variety of different formats—in graphics, in writing, and in presentations. Scientists with strong communication skills are better teachers, better colleagues, and more persuasive advocates for science. And yet we do not typically teach scientific communication directly.

To address this gap, we designed a class where students learn scientific communication in the context of problems relevant to their own research. We address three modes of scientific communication: graphics, writing and presentations. Across all modes, we emphasize three core principles: teaching a process, finding the essential story and getting critical feedback.

**Course structure**

This course is presented as 13 sessions (seven centered on graphics and writing, six centered on presentations). In the graphics and writing section each student will create a news and views style article based on recent research from the graduate program. They will be guided in steps to create this piece and be mentored one on one with an author of the primary research paper. The piece will be published on the Systems Biology Graduate Program website. In the presentations section, students will practice improvisational theatre skills and receive detailed feedback on a series of oral presentations they will create.

Interwoven with the first section on graphics and writing, we will present material on how our identities influence our experience as communicators, reviewers and audience members. We will focus on how we can engage with issues that may arise in our own careers and during our time as students.
Each session consists of a mix of short lectures, hands-on exercises and feedback in small peer groups. We explicitly teach students how to lead these groups and how to constructively critique one another. Every session will be three hours long (running from 1 to 4 pm on Fridays) with a break for refreshments and stretching in the middle. This may seem long at the outset however time for discussion and peer feedback is of paramount importance!

**Mentorship for the News and Views Assignment**

Students will be assigned a mentor to assist them in working on the New & Views assignment to be completed in the Graphics & Writing section of the course. Each mentor will be either a PI, post-doc, or graduate student who was an author on the journal article that is assigned to the student. We hope this will be an opportunity for students to build a relationship with a member of the department that will continue beyond the class. As such, students are required to meet with their mentors at least two times, in the weeks listed below, and are encouraged to meet additional times, as necessary.

**Meeting 1:** Between Class 3 to 4 (9/21-9/28): To clarify details/implications of the paper and discuss ideas for article.

**Meeting 2:** Between Class 7 and the retreat (10/19-11/2): To receive feedback on finished draft before turning in final work.

**Grading**

Grades for the class will be determined as follows: ⅓ participation, ⅓ quality of feedback to peers, ⅓ assignments. We understand that students will come in with different levels of skill and comfort in writing and presenting. We will therefore emphasize effort and improvement when assigning grades.

**Class dates and major project deadlines**

*Note that other smaller assignments will be due each class*

**September 7**
Introduction, Graphics & Writing: Structure, Goals, and Stories

**September 14**
Graphics & Writing 2 : Connecting with Others

**September 21**
Graphics & Writing 3 : Frameworks 1

**September 26 (Wednesday)**
SCAR analysis due; Meet with mentor
September 28
Graphics & Writing 4 : Frameworks 2

October 1 (Monday)
Detailed outline and three figure sketches due

October 5
Graphics & Writing 5 : Tools 1

October 10 (Wednesday)
Rough draft and two color sketch due

October 12
Graphics & Writing 6 : Tools 2

October 19
Graphics & Writing 7 : Tools 3

October 26
Presentations 1 : Two Slide Workshop

November 2
NO CLASS - RETREAT.
Feedback is due to partner; meet with mentor

November 9
Presentations 2 : Improvisation with ImprovScience
News & Views assignment due

November 16
Presentations 3 : Student Presentations 1

November 23
NO CLASS - THANKSGIVING

November 30
Presentations 4 : Student Presentations 2
Group A 10 minute talk due

December 7
Presentations 5 : Dealing with Questions and Conclusion of Class
Group B 10 minute talk due