The goal of this course is to give incoming graduate students exposure to and experience with many of the skills they will use as a scientist. This course will be an active learning course, many of the meetings will include hand-on activities during class time. There will be weekly writing assignments. All assignments are due at the start of the next class period unless otherwise indicated.

The course meets for two hours per week all semester.

The course will be team taught by departmental faculty.

Attendance: You are expected to attend all classes. If you need to miss a class for field work, attending a national meeting, etc., please consult with the instructor of that class (and copy Carrier on the email) as far in advance as possible to see if you can complete the assignment. If you are ill and cannot attend class, please notify the instructor as soon as possible.

Evaluation of Performance: Your final “grade” in the course will be based on completion of the assignments and class participation.

Week 1: Aug. 26
Introduction to the course, each other.
Grad school basics.
How to navigate differing lab cultures.
CV and personal statement make-over.
Instructors: Don Feener and Markus Babst

**Bring your CV and personal statement from your grad school application to this class.

Handouts:
How to be a terrible graduate student
Denise’s guidelines
Science C.V. guidelines
Personal Statement Guidelines

Assignments for next week’s class:
1. Revise your C.V. and personal statement. Turn these in at the beginning of the next class with a copy of your old marked up statements.

2. Read the document **Introduction to the Responsible Conduct of Research**, published by the Office of Research Integrity. A pdf of the document can be obtained from the course website or downloaded from the following URL: [http://ori.hhs.gov/ori-intro](http://ori.hhs.gov/ori-intro). Download the course homework assignment found on the website and complete before class on Sept. 9


**Sept. 2 - Labor Day Holiday, no class**

**Week 2: Sept. 9**

**Ethics in research.**

Instructor: **Colleen Farmer**

**Assignment**: Complete the handout on ethics in research available on the course website.

**Research**: Have a general idea of the area in which you will focus your predoctoral proposal. Write a title for your proposal for next week’s class.

**Assignment for September 16th. Find and send to David Goldenberg two scientific illustrations** (graphs illustrating quantitative data or concepts, not literal renderings such as photos or electron micrographs). One of these should be an excellent graph, to be studied for what it can teach us to do in our own work. The other should be a terrible graph, to be studied for what it can teach us not to do. Please e-mail these (as image files less than 1 MB in size) to: goldenberg@biology.utah.edu, by Thursday, Sept. 12. Be sure to identify which graph is the good one and which is bad!


Additional information for the Sept. 16 class will be posted on the course website.

**Week 3: Sept. 16**

**Thinking graphically: The art of making figures**

Instructor: **David Goldenberg**

Before coming to class look at the lecture by Dan Little (PDF on course web site) and the classic book by Edward Tufte (The Visual Display of Quantitative Information, one copy in the course “treasure chest” in ASB 404). Please be very careful with the book, which is Jon’s personal copy, and do not take it from the room.
Assignments for next week’s class (Sept. 23rd):

Written Assignment: In the week after the course meeting, give some awful or not-so-good graph an extreme makeover. The graph to be improved or replaced could be your “terrible” example from class, or another that seems more interesting to you (perhaps an old graph made by you, or your advisor. The improved graph does not need to be finished and publishable. A sketch showing the basic ideas will be fine. Include a few sentences (no more than a page) explaining what you did and why.

Reading Assignment: Read the assigned predoctoral proposals.

Written Assignment: Turn in 1 page document with the proposals rank ordered from best to worst. State whether you would fund this proposal and why or why not.

Week 4: Sept. 23
Writing proposals: Proposal review
Instructors: Denise Dearing, Dave Carrier

We will conduct a proposal review panel similar to that of NIH or NSF. You will be assigned as the PRIMARY and SECONDARY reviewer on two proposals and are expected to read all the assigned proposals. In class, we will have a panel discussion. You will be asked to summarize the proposal on which you are a primary and to comment on the one on which you are a secondary reviewer. The panel will be asked in general to discuss each proposal. This process will be expedient as we will have ~10 minutes to decide on the fate of each proposal (Just like the real world). We will rank order the proposals and will assign the top 11% to funding (generous!).

Assignments:

Reading Assignment: Read of the assigned predoctoral proposals.

Written Assignment: Turn in 1 page document with the proposals rank ordered from best to worst. State whether you would fund this proposal and why or why not.

Written Assignment for Sept 30th: Make an outline of the proposal. Write an outline (1 pg or less) of the proposal for which you were the primary reviewer. The outline should include the main topic of each paragraph and any subtopics.

Write a similar outline (no longer than 1 pg) for your NSF predoc proposal. This should include questions or hypotheses to be addressed and a topic sentence (or main focus) for each of your paragraphs. Make sure to include a title for your proposal.

Week 5: Sept. 30
Writing proposals: Proposal format, tips, developing a predoctoral proposal
Instructors: Denise Dearing, Dave Carrier
Assignments: Talk to your advisor about proposal ideas. Pick one!

Written Assignment: Turn in the outlines (your primary proposal and your NSF proposal). This assignment is described above.

For next week: Make an appointment for the week of OCT 7th to review your outline with one of the mentors.

**Week 6: Oct. 7**  
**Meet with Mentors**

Mentors:

Schedule a time with the instructors to individually review your outline.

*Note: We will not meet as a class this week because you will be meeting individually with your assigned mentor.*

Assignment:

Written Assignment for Oct 15th: Write the your first submission of your proposal. This draft should be as well written as you can make it. It is not a “rough, first draft”! It should be proofread and free of typos and spelling errors. It is recommended that you have at least one other person read it and give feedback before turning it in on Oct 18th.

**Oct. 14 - Fall Break, no class**

**Week 7: Oct. 21**  
**Review proposals**

Instructors: Dave Carrier

Assignment: (1) Submit your proposal to Karen Zundel by 3:30 PM. (2) Receive two proposals to read and review by Oct. 28.

Note: No class this week.

**Week 8: Oct. 28**  
**Receive reviewer’s comments. Make an appointment with your mentor to go over the comments on your proposal.**

Instructors: Dave Carrier

*Note: We will not meet as a class this week because you will be meeting individually with your assigned mentor.*

Assignment: Submit your reviews to Karen Zundel by 3:30 PM. Meet with your mentor to discuss reviewers' comments. Revise your proposal incorporating reviewers’ comments.

Additional dates:
Oct. 28 - Submit revised proposals to Karen Zundel by 3:30 PM.
Nov. 8 - Proposals due at NSF.

**Week 9: Nov. 4**
**Reading the scientific literature**
**Instructor:** Tom Kursar

*Reading Assignment* for Sept 10th: the paper(s) **Kursar will supply. Reading the scientific literature (2).*

*Assignment for Nov 11th: Prepare a 10 minute presentation on 1) your prior research as an undergraduate or Master’s student, 2) one aspect of the research being conducted in the lab group you have joined or 3) something else with consent of the instructor. Six volunteers are needed to present at the Nov 12th meeting. Early speakers should arrange a time with Drs. Horvath and Adler to review talk preparation prior to the Nov 12th presentation.*

**Week 10: Nov. 11**
**Preparing and delivering oral presentations**
**Instructor:** Martin Horvath and Fred Adler
**Assignment:** TBA

**Week 11: Nov. 18**
**Preparing and delivering oral presentations**
**Instructor:** Martin Horvath and Fred Adler
**Assignment:** TBA

**Week 12: Nov. 19**
**Preparing and delivering oral presentations**
**Instructor:** Martin Horvath and Fred Adler
**Assignment:** TBA

**Week 13: Nov. 25**
**How to write a review**
**Instructor:** Jack Longino
**Assignment:** TBA

**Dec. 2 - Open**

**Week 14: Dec. 9**
**Outreach and presenting lectures to the public.**
**Instructor:** Nalini Nadkarni