CHEM-GA 2673 Professional Development in the Sciences
Fall 2020
Fridays 1-3 PM, via Zoom

Zoom Link (also available on NYU Classes): https://nyu.zoom.us/j/94794161004

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Course Summary
As you embark on your graduate school career or begin your postdoctoral stint, you will delve deeply into your research projects that lead to important discoveries. The purpose of this course is to create a forum for discussion of topics ranging from responsible conduct of research, management and leadership skills, and communication skills. This course satisfies the NIH requirement for a minimum of eight hours of formal instruction in the Responsible Conduct of Research. Components required for Responsible Conduct in Research certification are indicated by an asterisk*.

Reading material
The instructors will provide articles and other reading material from current literature. Additional useful resources are summarized at the end of this document.

Topics outline
1. **Challenges and success in graduate school (Sep 4).** Welcome to graduate school! How will you make the best out of this opportunity? This lecture will provide an overview of graduate education in the sciences. General description of the academic environment in which graduate work is conducted, and common challenges faced by students. We will discuss mentor and trainee responsibilities and each of you will start an Individual Development Plan. (PA)

2. **Safety in the research and instructional laboratories (Sep 11).** Discussion of the safety aspects of conducting and leading chemical experiments in the research and instructional laboratories. Protective equipment and emergency response procedures. University policies and resources for the safety training of research personnel. (NYU Environmental Health and Safety)

3. **Scientific integrity and misconduct in science (Sep 18 and 25).** Ethical behavior in scientific research. Forms of scientific misconduct: falsification, fabrication, and plagiarism. Procedures for handling allegations of scientific misconduct in research. Conflict of interest. (Sep 18: Bill Trenkel; USDA Senior Advisor for Scientific Integrity; Sep 25: PA)
4. **Federal funding (Oct 2).** A general overview of the federal agencies and the mechanisms used to support scientific research. Rules governing grant writing and the use of federal funds. Discussion of some of the key aspects involved in developing competitive scientific proposals, from the conception of the idea to planning for unexpected results. How to formulate objectives and hypotheses, articulate the significance of the project, and develop a search plan. (NT)

5. **Performing research (Oct 9).** Data acquisition and management Good practices in scientific record keeping and their importance. NYU policies on retention of and access to research data. (Prof. Daniela Buccella)

6. **Responsible authorship practices (Oct 16).** A discussion of the importance of publishing your work in scientific journals and how to do so successfully. Selecting a journal to reach the appropriate audience and adapting your writing style for different audiences. Sections of a paper and their contents. Who gets authorship credit: Scientific contribution and authorship? A discussion of the roles and responsibilities of authors, as well as practices that should be avoided. Attribution of credit and responsibilities in collaborative research. The role of effective communication and management in successful research collaborations. (TL)

7. **Peer review (Oct 23).** A brief overview of the editorial process and what happens to a manuscript after it gets submitted. A general description of the publication and peer review process, as well as the ethical responsibilities of all parties involved. The lecture will also discuss the challenges involved with peer review, see: Peer Review: The Worst Way to Judge Research, Except for All the Others. NYT Link (Prof. Anna Mapp, U. Michigan, Associate Editor ACS Chemical Biology)

8. **Diversity & Inclusion in Sciences.** (Oct 30 & Nov 6) These two sessions are organized by Amanda Ramdular. What can departments, institutions, and individuals do to mitigate bias? How do we ensure that everyone in our department feels welcome and safe to pursue their research ideas? (Oct 30: Prof. Marcus Lambert (Weill Cornell); Case studies (Nov 6)).

9. **How to be an effective teacher (Nov 13).** Sharing is caring! Science thrives when discoveries and concepts are shared with other scientists, non-scientists and students. We share our scientific knowledge in classrooms and in conferences. On Nov 13, Prof. Trace Jordan will discuss how you can become an effective teacher (Prof. Trace Jordan)

10. **Career paths after graduate school.** You’ve got a degree... now what? Meet three ex-NYU graduate students and hear about their life stories. (Nov 20: Justin Holub (Ohio University), Brooke Bullock Lao (Pfizer), and Joy Romulus (Lipoid, LLC))

11. **Eat leftover Thanksgiving Turkey or your vegan alternative (Nov 27).**

12. **Seminar on Seminars (Dec 4).** How to present your research to a scientific audience. (Prof. Simon Friedman, UMKC)

**Assignments and grading**

Attendance is mandatory for all first-year graduate students in the Chemistry Department. There will be no graded assignments or examinations. Students are expected to review threading
material provided by the instructor and participate in the discussion of case studies presented during the sessions

**Useful resources**
- NYU Research Misconduct Policy
- National Academy of Science Publication “On Being a Scientist”
  http://www.nap.edu/openbook.php?record_id=4917
- DHHS Office of Research Integrity
  http://ori.hhs.gov/
- *Scientific Integrity. Text and Cases in Responsible Conduct of Research, 3rd Ed.*
  Website companion:
  http://www.scientificintegrity.net/
- *ACS Style guide: Effective Communication of Scientific Information, 3rd Ed.*