SIO 273 Professional Ethics in Science

Winter 2015
4 units, Letter Grade
Meets: Th 3:30 – 5:30, Hubbs 4500

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Overview: The goal of this course is to create an informed and lively discussion of a range of important ethical questions that arise in professional science from graduate school to research and teaching settings. The course is organized around weekly topics, centered on background reading materials with student presentations. During the quarter each student, working in pairs, will make a weekly presentation to the class and lead the discussion. An overview of the weekly topics is listed below. We have specific agendas of material to cover, so each team will meet with the instructors to go over the material in advance. The team will check back with the instructors after they have prepared their presentation to avoid overlaps and to insure that the important material is covered. Before presenting, the student pairs for that week will assign 2-4 readings to the class and everybody is expected to have read the material before class. These assigned readings and additional background reading material will be posted to a course web resource. We anticipate that some of the topics will stimulate personal experiences that each student will want to discuss on week 9. In order to pick the case histories or personal syntheses you want to discuss with the class, we ask that your submit brief summaries that you might want to present and we will choose 3-5 or some subset so we can present them in the limited time. The final class will be a discussion of ideas and guidelines for solutions to ethical issues that may arise in their professional scientific careers.

Topics:

<u>Week 1. Introduction</u>

Paul Dayton: Value Systems and the Importance and of Integrity and Balance

<u>Week 2. Cheating Through History</u> – feet of clay ("*so the kingdom shall be partly strong, and partly broken…")*

Weaknesses and character flaws in people of great prominence and many of the greatest geniuses in history

Many of the greatest scientists cheated - Ptolemy, Galileo, Newton, Dalton, Bernoulli, Millikan. Only Einstein who did not collect data and god-like Neils Bohr are missing from the Pantheon of famous cheaters.

Is it ok to cheat if you are right? Was it really cheating?

Forms of cheating in science - data cooking to creative editing, precision of measurements vs 'knowing' the answers

Week 3. Philosophy of Science: ideals and reality

How science is "supposed" to work - Popper, Platt and Chamberlain and the hypothesis testing / falsificationist ideal. But does this paradigm fit all modes of science?

Kuhn and *The Structure of Scientific Revolutions*

Feyerabend anything goes?

Lehrer *The Truth Wears Off*

Self-deception and the problems of "theory ladennes" and "dormative concepts"

Week 4. Mentoring (student-professor advising relationships)

Mutual responsibilities in creating beneficial student-professor advising relationships

Differences between teaching and learning

Potential issues – proper credit (and where do ideas *come* from?); power relationships and abuse of power (training students to be creative peers, apprentices, competitors?).

Authorship and The Matthew Effect ("For unto every one that hath shall be given…")

Week 5. Academic Reward Systems, Accountability

Manuscript and Proposal Reviewing: Competitors exposing their best ideas, extremely vulnerable

Excessive negativity in reviews

Mediocrity chokes creativity – is it ok to be nice with poor proposals/manuscripts?

One-person race?

Open access and pay-to-publish journals

Citations and forms of soft cheating:

A. Plagiarism: deliberate presentation of another's text or ideas, as ones own with intent to deceive.
B. Allocation of credit
C. Use of ideas from unpublished sources
D. Delaying or inhibiting the progress of a rival

Week 6. Academe-Industry conflicts and Intellectual property

Ownership and retention of data. Foundation funding and open-access data models

Conflicts of interest in funding and research

Open information vs secrecy. The very ideal of academe is open communication of knowledge

Biotech/pharma-funded research?

Classified research in Academe?

Military? Not allowed (Mansfield Act), but is there a place for it?
Consulting? Proprietary information - Exxon Valdez situation common
Corporate-academic agreements
Examples of the success of openness are rare

Week 7. Environmental Conflicts

"The right to search for the truth implies also a duty: one must not conceal any part of what one has recognized to be true." Einstein

Crying Wolf and the problems of a scientist with an agenda

"Ye shall know the truth and the truth shall make you free"

Communicating scientific knowledge and uncertainty fairly – anything goes?

Weeks 8 AND 9. Discussion of Student Case Studies

In advance of this week each student will write up a brief synopsis of an example situation and resolution of a situation she/he has faced and present it to the instructors on week 7 and we will select the ones for general discussion based on various subjective criteria.

10. New Ideas and Potential Solutions Going Forward

1. Responsibility of junior authors
2. Self-policing: random audits
3. Whistle blowing: Don't forget "Due Process" applies to anyone: presumption of innocence! Due process has three components or rights:
    a. Fully informed of accusations and sources. No star chambers
    b. Present and rebut evidence
    c. Cross examine witness
4. Use of courts
5. Retractions and verification
6. Institutional policies and procedures
7. Exaltation of our ideals

JDI: "There is no limit to what can be accomplished, if it does not matter who gets the credit." ANON