

BIOLOGY 347 -- 2006

PRINCIPLES AND METHODOLOGY IN BIOLOGICAL RESEARCH

Contemporary research in the Botany and Zoology Departments; history and methodology of scientific discovery; seminars on current problems.

COURSE OBJECTIVES

1. *To introduce students to the faculty in the Botany and Zoology Departments and provide information on their research activities, with the intent that this information will help the students to select supervisors for their thesis project (BIOL 449) in their 4th year.*
2. *To assist the students in developing an understanding of the important research issues in Biology that are actively represented here in Botany and Zoology.*
3. *To provide students with an understanding of the different approaches employed in biological research by meeting with selected faculty and discussing their research activities.*
4. *To expose students to important scientific, political, ethical and economic issues that are of general concern to scientists.*
5. *To help students to develop skills in summarizing and presenting scientific research, as well as skills in discussing science and in facilitating discussions.*

Participation in this course should help students in their choice of career and in their appreciation of what it is like to be involved in scientific research. By meeting with selected members of faculty, students will have the opportunity to learn about different approaches and techniques being used in contemporary life science. They will learn about areas of research opportunity. They will be exposed to some applications of their science, as well as logistical, political and ethical aspects of doing research.

Grading: Students will be evaluated on the basis of:

- The quality of their "News & Views Presentation/Discussion". (40%)
 1. Selection of article is important as well as the quality of its presentation.
 2. Why is it important, why is it appropriate to this course; is it understandable?
 3. Was the context of the research explained?
 4. Was the methodology highlighted and compared to approaches discussed in the course?
 5. Does the issue have scientific merit?
- Their overall participation in class discussions. (20%)
- Their performance on an essay style final exam. (40%)

Biology 347 – Principles and Methodology in Biological Research

The Weekly Cycle of Activities -- 2006

Please arrive in the classroom on or before 2:00 PM. Our schedule is full, and we will need the full 3-hour class session to complete all our activities.

Before Class – Each week, two student will give a “News and Views” presentation at the beginning of our Friday meetings. Before class, each of these **student presenters** will select a brief article to serve as the basis of their “News and Views” presentation and discussion. Each student’s article should be pertinent to the general subject area being represented by our guest speaker that week. Editorials, News and Views articles from *Nature* or *Science*, brief articles from the *Trends in ...* series or stories from the New York Times would be good choices. Try to select articles that are understandable to the non-specialist and about issues that are of broad significance to the life sciences. Each students will create a **one-page handout (single sided)** about their presentation that will be distributed to the class at the start of their presentation. The handout will have:

- The student’s name, the full citation for the article, as well as the full citation for the actual article on which the news & views article is based (Authors, year, title, Journal...).
- A brief outline of key concepts of the research.
- Examples of results/data that will help the audience to understand the science.
- Possible directions for future work on this area.
- Useful references, if appropriate.

Dr. Gosline will do the photocopying for you if you deliver it (email) one day in advance.

Start of Friday’s Class: It is essential that you attend all class meetings, as your participation in class discussions is crucial to this course. A daily sign-in list will be circulated at the start of each class. Please arrive on time. If you must miss a class on occasion, please let us know in advance, if possible.

1st Part of Friday’s class: Student Presentation and Discussion. (ca. 60 minutes) – Most weeks there will be two student presentations, each lasting about 30 minutes, including the discussion. The presenter will briefly summarize their “News and Views” article (typically about 10 minutes only) and will remain at the front of the class to provide expert input for the discussion that can occur both during and after the summary is presented. We hope that the discussion will include the specifics of the presentation and in addition some general discussion about:

- What approaches were used in the science discussed (how was it done?)?
- What other approaches could be used, what would be the kinds of outcomes?
- What ethical/political issues might arise from the research.

--- 10-15 minute coffee break ---

2nd Part of Friday’s class: Presentation by Visiting Faculty. (40 min presentation followed by a 20 min discussion) – The visiting speaker will outline their research activities, highlighting their personal experiences, approaches and perspectives on research. This will be followed by a discussion involving the whole class.

Course Instructors

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