OB011: Advanced Topics in Biological Research

OB012: Advanced Topics in Biological Research: Writing Option

Course Description

Advanced Topics in Biological Research is a year-long seminar course that explores a variety of biological concepts in depth through discussion of scientific research. Topics are chosen from the breadth of the discipline and build on the foundation of knowledge acquired in AP Biology. Students study molecular and cell biology, genetics, plant biology, medicine, evolution and ecology by reading both current and seminal research publications and discussing these works as a group. Not only do students gain an appreciation of relevant research topics in modern biology, but they also learn about valuable research tools and the skills necessary to understand the frontiers of the science.

Students enrolled in the Writing Option will additionally discuss the forms and styles of science writing including primary research publications, reviews, and science journalism. Students will apply their knowledge of these forms by composing a review article or significant research paper on the modern biological research topic of their choosing. Throughout the writing process, students will learn the skills necessary to independently and deeply explore scientific research literature and the process of writing, editing, and reviewing a lengthy written piece including peer-evaluation.

Learning Objectives

Through the successful completion of the Advanced Topics in Biological Research seminar course, students will:

• Have an appreciation for currently relevant areas of research in biology and knowledge of avenues that may be pursued within those areas.
• Have a historical context for modern research through review of landmark research.
• Be able to identify high-quality research in biology as well as be able to recognize alternative hypotheses that may also be supported by the data.
• Understand how high-impact discoveries are made in biology and how scientists’ hypotheses and theories may change when new data is acquired.
• Possess the skills necessary to comprehend primary research publications in biomedical and biological sciences.

Students that complete the Writing Option will additionally:

• Recognize the audience, tone, and focus of primary research publications, review papers, and science journalism.
• Be able to successfully engage in a prolonged research project, including a thorough review of the literature and synthesizing that information in a new and engaging way through a written format.
• Have the skills necessary for scholarly critique of another’s written work.
Required Resources

Readings will be chosen from journals for which Stanford University has a subscription. They will therefore be available, free of charge, through the Stanford University library.

Key Assignments

Each semester, the final letter grade will be determined through the following types of assignments. Grading policy is discussed in the course policies.

- **In class participation:** Participation is a key component to the proper functioning of this course, and thus all students are expected to come to class prepared to actively discuss the topic of the class session. Readings will be posted on eCollege, and students are expected to thoroughly read and consider the assigned papers before the start of class weekly.

- **Reading response:** Each week, students will submit a brief written review of the week’s paper in preparation for discussion. Prompts will be posted with each week's reading to guide students’ examination of the paper.

- **Paper presentation:** Each discussion after the first few weeks of the course will be led by an individual student. That student is responsible for reading the assigned papers, doing necessary background research, preparing a presentation of the material, and meeting with the instructor in advance of the class session. Depending on enrollment, students may present 1-2 times per semester.

- **Midterm and final exams:** Two exams assessing attainment of the learning objectives will be administered, the first approximately half-way through the semester and the other during finals week.

Students enrolled in the Writing Option will additionally complete the following assignments.

- **Writing response (Fall Semester):** Each week of the first unit of the course, students will analyze a form of science writing and relate the piece to the primary research from which it derives.

- **Prospectus (Fall Semester):** Students will propose a topic and conduct preliminary research for their Spring research.

- **First and Second Drafts (Spring Semester):** Students will engage in an independent, iterative process of producing a significant written work, guided by the instructor and with the mutual support of classmates.

- **Peer Review (Spring Semester):** Students will conduct a thorough and constructive critique of one another’s work including editing of the document and collaborative discussion of points of improvement.

- **Final Paper (Spring Semester):** Through the above process, students will produce a 20-30 page paper going in-depth on the biological topic of their choice,