

BIOC440
Concepts in Molecular Biology

COURSE CHAIR: Dr. LeAnn Howe
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INSTRUCTORS: Dr. LeAnn Howe, Kristina McBurney, and Dr. Eric Jan.

PREREQUISITES: All of BIOC303, BIOC402, and BIOC410.

COURSE GOALS:

1. To foster the development of students' skills in interpreting, presenting and critiquing primary literature.
2. To introduce students to the use of model organisms and emerging techniques in molecular biology.

SCHEDULE (subject to minor alterations):

The course is divided into eight modules of four classes. Each module will focus on a different topic and consist of two lectures followed by two classes in which groups of 2-3 students present an assigned article of primary literature.

Jan. 5 - Feb. 25 (Dr. LeAnn Howe) - Model organisms.

Jan. 5: Course introduction

Jan. 7-16: Yeast as a model organism

Jan. 19-26: Drosophila as a model organism

Jan. 28- Feb. 24: Mammalian cell culture

Feb. 6- Feb. 23: Mouse embryonic stem cells

Feb. 25: Quiz #1

Feb. 27- Mar. 6 (Kristina McBurney) – Systems biology

Mar. 9 - Apr. 3 (Dr. Eric Jan) – Gene regulation and model organisms

Mar. 9-16: Developmental decisions

Mar. 18-25: RNA modifications

Mar. 27- Apr. 8: RNA editing

Apr. 10: Quiz #2

GRADING:

- The final grade will be based on marks from two quizzes (15% each), two oral group presentations (15% each) and in-class participation (40%).
- The quizzes will be open book format and will consist of problem solving-type questions based on techniques and concepts described in classes and in journal articles. Practice problems will be posted on Connect.
- For oral presentations, each student will be assigned two journal articles that they will present, jointly as part of a group of 2-3 students, to the class. The following rubric will be used to assign grades:

MARK (%)	PRESENTATION RUBRIC
90-100	Very engaged presenter. The oral presentation, visual aids and answers to questions reflect a high level of attention, preparation and understanding of the paper. The presentation reflects effective teamwork. Has carefully read the paper being presented as well as additional relevant experimental, methods or review papers. Provides a critical assessment of the primary data. The presentation shows not only material from the paper being presented but also additional material to clarify, extend or deepen the presentation. The presentation is clear, logical, complete and delivered in a dynamic manner and is delivered within the allocated time.
80-89	Engaged presenter. The oral presentation, visual aids and answers to questions reflect a solid level of attention, preparation and understanding of the topic. The presentation reflects effective teamwork. Has carefully read the paper being presented as well as additional relevant experimental, methods or review papers. The presentation shows not only material from the paper being presented but also additional material to clarify the presentation. The presentation is clear, logical, and complete and is delivered within the allocated time.
70-79	Average presenter. The oral presentation, visual aids and answers to questions reflect an adequate level of attention, preparation and understanding of the topic. The presentation reflects adequate teamwork. Has carefully read the paper being presented but has not read additional relevant experimental, methods or review papers. The presentation shows material from the paper being presented but little if any relevant additional material. The presentation is not always clear, logical, complete or is not delivered within the time allocated.
69 and below	Poor presenter: The oral presentation, visual aids and answers to questions reflect a minimal level of attention, preparation and understanding of the topic. The presentation reflects ineffective teamwork. Has read the paper being presented but has not read additional relevant experimental, methods or review papers. The presentation shows material from the paper being presented but no relevant additional material. The presentation is not clear, logical, or complete and is not delivered within the time allocated.

- Students not presenting are expected to have read the assigned article in sufficient detail to participate in discussions. The following rubric will be used to assign participation grades:

MARK (%)	PARTICIPATION RUBRIC
90-100	Very engaged participant. Contributes questions and comments in all classes. The questions and comments are insightful and reflect a high level of attention and preparation. Has carefully read all papers being presented by others and has occasionally read additional relevant materials such as review and methods papers. The questions and comments consistently add to, extend or deepen the discussion. Arrives at class on time and does not miss classes.
80-89	Engaged participant. Contributes questions and comments in all or nearly all classes. The questions and comments are often insightful and reflect a solid level of preparation. Has carefully read all papers being presented by others. The questions and comments consistently add to the discussion and occasionally deepen or extend it. Arrives at class on time and does not miss classes.
70-79	Average participant. Contributes questions and comments in most classes. The questions and comments are seldom insightful and reflect only an adequate level of preparation. The questions and contributions occasionally add to, deepen or extend the discussion. Has read all papers being presented by others but only superficially. Occasionally comes to class unprepared or late.
69 and below	Poor participant. Contributes questions and comments in few classes. The questions and comments are not insightful and reflect an inadequate level of preparation. The questions and comments rarely add to the discussion. The student has read few of the papers being presented by others. Often comes to class unprepared, or late, or is absent.