

Evolutionary Developmental Biology
01:447:470 Spring 2020

Description/format of class

Due to the Covid situation, this course is conducted in a synchronous remote manner via Zoom. As this course is designed as an active learning, students will be assigned into Breakout Rooms in Zoom for group discussion in lectures. Through the group discussion, students are expected to learn how to integrate different disciplines to answer long-standing mysteries in evolutionary developmental biology. The lectures will be recorded and also PPT slides will be uploaded on Canvas after each lecture so that students can review them later.

The lectures are scheduled on 12-1:20 pm Tuesday/Thursday. Students are expected to attend the lectures online to obtain attendance point. Students who have difficulties to attend lectures during this time period should contact an instructor beforehand.

Course contents:

Assignment: Before a lecture, students are expected to read 10-20 pages of textbooks. The learning achievement will be assessed by miniquiz.

Miniquiz: At the beginning of each lecture, miniquiz will be conducted for testing the assignment.

Exams: Three exams will be held online on the days listed in the syllabus. Each test would have multiple choices and descriptive questions. Students are expected to fill out the exams on their own computers and submit to an instructor by email.

The office hours: if students have any questions or concerns in lectures, an instructor discuss them via Zoom. Have an appointment via email is necessary.

What is the class like?

This is a course to help students understand how we approach evolutionary problems by integrating comparative anatomy, genetics, genomics, and developmental biology. To follow the course, pre-reading the provided materials or text books are necessary. The course will proceed with a significant amount of small group discussion, presenting own ideas, and discussion with the instructor. **Presenting your idea and discussing scientific problems in a class are significantly encouraged.** The course is roughly divided into three components and a group presentaion:

-Comparative Anatomy

The Instructor will explain the basic anatomy of the vertebrate body and the ways to compare morphologies among different species. Pre-reading of textbooks is necessary, and the knowledge will be tested by a mini quiz at the beginning of lectures. You do not need to remember all of the anatomical vocabulary. However, if you do not pre-read textbooks, you do not have enough time to answer all of the mini- quiz. Some group activity will be followed by discussion with an instructor.

-Development

The molecular mechanisms of vertebrate development and current problems will be explained by an instructor. Pre-reading of textbooks is necessary, and the knowledge will be tested by mini quiz at the beginning of lectures. Basically, lectures will proceed with active group discussions and Q&A style with an instructor.

-Genomics and genetics

An Instructor will provide recent articles that deploy state-of-the-art genomics techniques to answer evolutionary questions before lectures. Pre-reading of these papers is necessary. An Instructor will do a mini quiz at the beginning of lectures. The lectures of genomics and genetics would be more practical than that of anatomy and development. Through discussion in lectures, students will learn how to combine anatomy, genomics, genetics, and developmental biology to answer evolutionary questions.

-Group presentations

Students will be randomly assigned into small groups (2-3 students) and will explore evodevo questions regarding animal diversity. Each group chooses a scientific question and prepare a presentation that shows how to approach the question. Each group will provide 10-15 minute presentations followed by 5 minutes Q&A session. The details of presentation style and score criteria will be provided in classes.