

Instructors and contact information:

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Course description: This 3 credit laboratory course will address key concepts of developmental biology using zebrafish as a model organism. Students will use an array of techniques including imaging of living embryos, microinjection, and *in situ* hybridization.

Course objectives:

- Learn important experimental methods used by modern developmental biologists.
- Develop skills broadly applicable to other fields in experimental biology, including experimental design, execution, data analysis and result presentation (oral and written).
- Apply these skills to design and carry out independent experiments.

Prerequisites: Zoology 470, Introduction to Animal Development or Zoology 523, Neurobiology

Reading: All the required reading material will be distributed via email prior to class. **PLEASE NOTE: you are responsible for printing these materials and bringing them to class.** The mailings will include laboratory protocols, research paper reprints and other readings. PDFs of the documents will be uploaded to UW Box. Labs will be based on concepts you learned in Zoology 470. We recommend that you re-read the relevant sections of Gilbert, the Zoo 470 textbook, after reviewing the protocol and before coming to class. A copy of this book will be available for *use in the classroom only*.

Office hours: There will be no regularly scheduled office hours. We invite you to contact us in class or by email to set up appointments as needed.

Grading: The final grade for the course will be calculated as follows:

Laboratory notebook:	30%
Quizzes:	20%
Independent projects:	40%
Class participation:	10%

The final letter grade assignment will likely, but not necessarily, be made using a conventional scale (A 90-100, AB 86-89, B 75-85, BC 71-74, C 60-70, D 50-59, F < 50).

Laboratory notebooks: Your notebooks will be collected a total of five times: at the end of each lab topic and at the end of the semester. Each time, only the section of the notebook corresponding to the last completed lab topic will be graded. Please see separate handout for more detail on notebooks.

Quizzes: Two quizzes will be given during the first part of the course. These quizzes are intended to test your command of the important terms and basic concepts, and will be based on material presented during class and/or in your assigned reading material.

Independent projects: During the last portion of the class students, working in groups, will design and carry out independent research projects.

Project proposal: Each group, working together with the instructors, will develop a written proposal that defines the questions to be addressed and describes the proposed experimental strategy. In addition, each group will also present this proposal to the class in PowerPoint format.

Final report: At the end of the semester, each student will prepare a written final report, describing the collected data and summarizing conclusions. The final reports will be in the format of a published scientific paper. The final projects also will be presented to the class by each group as PowerPoint talks during our last class meeting.

Final exam: There will be no final exam.

Collaborative work: Much of your work will be done in groups of two to four. Discussion of your protocols and results is encouraged but *your notebook entries must be written independently*. Credit will not be given for notes copied out of a classmate's notebook.

Missed laboratories, quizzes and presentations: Attendance in class is mandatory because this is a hands-on laboratory class. In case of an unavoidable planned absence or an illness, please notify the instructors as soon as possible. We will make every effort to work out arrangements for making up the missed quizzes and presentations. It will not be possible to arrange make-ups for most of the laboratories, and alternative arrangements will be made on a case-by-case basis. Please keep in mind that these opportunities will be offered only for unavoidable absences. For example, if you miss a class to study for an exam in another course, you will not qualify for a make-up and will not get the credit for the notebook or a missed quiz.

Other Rules: Use of cell phones, texting, reading newspapers, doing crosswords, etc. will not be allowed during class.

Classroom access: The classroom will be accessible outside of scheduled class times. Please note that *access is strictly limited* to students taking the course.