

Course Title: Research Rotation in Developmental and Reproductive Biology (DRB 695)

Course Description:

This research rotation provides graduate students in Developmental and Reproductive Biology with hands-on experience in a research laboratory. Students will gain practical skills in experimental design, data collection, analysis, and interpretation within the context of developmental and reproductive biology. This rotation is designed to introduce students to the research environment, different research methodologies, and potential thesis projects within the department. It is expected that this rotation will help students identify a research mentor and area of focus for their graduate studies. This course also allows instructors to establish whether a student is a good match for their lab. After completion of the course student and instructor will decide whether student should continue graduate research in this lab. If yes, DRB 699 course with the same instructor should be taken in the following semesters.

Prerequisites:

- Completion of a bachelor's degree in a relevant field
- Approval from a faculty instructor

Credits: 3

Course Format:

The course includes three components:

- **Laboratory Work (70%):** Students will actively participate in ongoing research projects in the instructor laboratory. This includes conducting experiments, collecting and analyzing data, and participating in lab meetings. Specific tasks will be determined in consultation with the instructor
- **Literature Review (15%):** Students will read and critically analyze relevant scientific literature related to their research project. This will involve identifying key research questions, understanding experimental designs, and evaluating the strengths and weaknesses of published studies.
- **Presentations and Reports (15%):** Students will present their research progress at lab meetings and prepare a written report summarizing their findings at the end of the rotation.

Course Learning Objectives:

Upon successful completion of this rotation, students will be able to:

- Understand the research process, from hypothesis generation to publication.
- Gain proficiency in specific laboratory techniques relevant to developmental and reproductive biology and the lab they are rotating in.
- Critically evaluate scientific literature related to their chosen research area.
- Design and execute simple experiments under the guidance of the instructor or assigned by instructor senior lab member.
- Analyze and interpret experimental data.
- Communicate scientific findings effectively through oral presentations and written reports.
- Develop professional skills, including time management, organization, and scientific ethics.

Assessment:

Student performance will be evaluated based on the following criteria:

- **Laboratory Performance (50%):** Assessed by the instructor based on the student's technical skills, work ethic, independence, and ability to learn and adapt.

- **Literature Review and Critical Thinking (25%):** Assessed by the instructor based on the student's understanding of the literature, ability to critically evaluate studies, and contribution to discussions.
- **Presentation and Written Report (25%):** Assessed by the instructor based on the clarity, organization, and scientific rigor of the presentation and written report.

Grading Scale:

This grading scale outlines the criteria for evaluating student performance in the research rotation. The final grade will be based on a weighted average of Laboratory Performance (50%), Literature Review and Critical Thinking (25%), and Presentation and Written Report (25%).

Overall Performance Descriptors:

- **A (90-100%):** Demonstrates exceptional performance in all areas. Exceeds expectations in technical skills, critical thinking, communication, and professionalism. Shows initiative, independence, and a deep understanding of the research project. Contributions significantly enhance the lab's research efforts.
- **B (80-89%):** Demonstrates strong performance in most areas. Meets expectations in technical skills, critical thinking, communication, and professionalism. Shows a good understanding of the research project and contributes effectively to the lab's research efforts.
- **C (70-79%):** Demonstrates satisfactory performance in some areas but needs improvement in others. Meets some expectations in technical skills, critical thinking, communication, and professionalism. Shows a basic understanding of the research project but may require more guidance.
- **D (60-69%):** Demonstrates weak performance in several areas. Struggles to meet expectations in technical skills, critical thinking, communication, and professionalism. Shows a limited understanding of the research project and requires significant guidance.
- **F (Below 60%):** Demonstrates unsatisfactory performance. Fails to meet expectations in most areas. Shows a lack of understanding of the research project and does not contribute effectively to the lab's research efforts.

Detailed Breakdown of Assessment Criteria:

1. Laboratory Performance (50%):

- **A (90-100%):** Mastery of techniques, consistently performs experiments accurately and efficiently, proactive in problem-solving, highly organized and meticulous, works independently and effectively, demonstrates initiative and takes ownership of projects, contributes to lab maintenance and organization.
- **B (80-89%):** Proficient in most techniques, performs experiments with accuracy and efficiency, effectively solves common problems, organized and maintains a good work ethic, works well independently, shows initiative and contributes meaningfully to projects.
- **C (70-79%):** Competent in some techniques, performs experiments with reasonable accuracy, requires assistance with problem-solving, generally organized, works with supervision, shows some initiative but may need prompting.
- **D (60-69%):** Needs improvement in several techniques, experiments often require repetition, struggles with problem-solving, disorganized and requires frequent supervision, demonstrates limited initiative.
- **F (Below 60%):** Lacks proficiency in most techniques, experiments frequently fail, unable to solve problems independently, consistently disorganized and requires constant supervision, demonstrates little to no initiative.

2. Literature Review and Critical Thinking (25%):

- **A (90-100%):** Demonstrates a comprehensive understanding of the literature, critically evaluates research articles, identifies key research questions and gaps in knowledge, synthesizes information effectively, contributes insightful comments during discussions.

- **B (80-89%):** Demonstrates a good understanding of the literature, critically evaluates research articles, identifies key research questions, synthesizes information well, contributes thoughtful comments during discussions.
- **C (70-79%):** Demonstrates a basic understanding of the literature, identifies some key research questions, synthesizes information adequately, participates in discussions but may require prompting.
- **D (60-69%):** Demonstrates a limited understanding of the literature, struggles to critically evaluate research articles, identifies few key research questions, synthesis of information is weak, limited participation in discussions.
- **F (Below 60%):** Demonstrates a poor understanding of the literature, unable to critically evaluate research articles, fails to identify key research questions, synthesis of information is lacking, does not participate effectively in discussions.

3. Presentation and Written Report (25%):

- **A (90-100%):** Clear, concise, and engaging presentation, well-organized and logical flow, demonstrates a thorough understanding of the research project, insightful analysis and interpretation of data, professionally written report with clear figures and tables.
- **B (80-89%):** Clear and well-organized presentation, demonstrates a good understanding of the research project, thoughtful analysis and interpretation of data, well-written report with clear figures and tables.
- **C (70-79%):** Adequate presentation, demonstrates a basic understanding of the research project, satisfactory analysis and interpretation of data, adequately written report.
- **D (60-69%):** Presentation lacks clarity and organization, demonstrates a limited understanding of the research project, weak analysis and interpretation of data, poorly written report.
- **F (Below 60%):** Poor presentation, demonstrates a lack of understanding of the research project, inadequate analysis and interpretation of data, poorly written report with significant flaws.

This detailed grading scale provides a transparent framework for evaluating student performance and ensures that all aspects of the research rotation are considered in the final grade. This scale is discussed with the student at the beginning of the rotation to ensure clear expectations.

Required Readings:

- There are no required textbooks for this rotation. Readings will be assigned by the instructor based on the specific research project. Students are expected to independently search and retrieve relevant scientific literature.

Recommended Readings:

- Literature selected by student, relevant to developmental and reproductive biology and research interest of the lab they are rotating in.

Lab Safety:

All students are required to complete all necessary lab safety training before beginning any laboratory work. Strict adherence to lab safety protocols is mandatory.

Ethical Conduct:

Students are expected to adhere to the highest ethical standards in all aspects of their research. This includes proper data handling, accurate record keeping, and responsible authorship.

Attendance:

Regular attendance in the laboratory and lab meetings is expected. Any absences should be communicated to the instructor in advance.

Rotation Schedule:

- **Week 1:** Introduction to the lab, research projects, and lab personnel. Literature review begins.
- **Weeks 2-15 (or as determined):** Laboratory work, data collection and analysis, ongoing literature review, lab meeting presentations.
- **Final Week:** Preparation and submission of the written report. Final presentation to the lab.

Note: This syllabus is a general guideline and may be subject to change at the discretion of the instructor. Specific details regarding the research project, required readings, and assessment criteria will be discussed between the student and instructor at the beginning of the rotation.

Instructor(s):

DRB graduate faculty: <https://grad-drb.jabsom.hawaii.edu/faculty/index.html>. In special circumstances graduate faculty from other programs are appropriate, if their research is relevant to DRB graduate program theme, and if their choice is approved by DRB program chair.

Contact Information:

Contact information about DRB graduate faculty can be found here: <https://grad-drb.jabsom.hawaii.edu/faculty/index.html>. Contact information about other graduate faculty can be found on their program or personal webpages or in UH faculty directory: <https://www.hawaii.edu/directory/>

Enrollment:

Interested students should contact DRB graduate faculty to discuss their goals and objectives and to inquire whether they are willing to accept them to their labs for Research Rotation. If an agreement is reached, faculty member will share their CRN number for DRB 695 which will enable student to register for the course. If a faculty does not have an active CRN number for DRB 695 for a given semester, please inform DRB program chair who will make arrangements to have this number created.

Note:

This course description and learning objectives are subject to adjustment based on the specific requirements and guidance of the faculty instructor and the DRB graduate program.