

BIOL 4050 Advanced Topics in Developmental Biology Syllabus Fall

DESCRIPTION: Developmental biology is one of the most exciting and rapidly progressing areas of biology, because researchers are using powerful new combinations of techniques and approaches to answer the question of how a fertilized egg is progressively transformed into complex organisms. Answers based on a combination of approaches from a broad range of disciplines including biochemistry, cellular and molecular biology, genetics and evolutionary biology. This course surveys the use of model organisms, such as *Xenopus* and the flowering plant *Arabidopsis thaliana*, and the use of genetic, cellular and molecular methods to explore how genes, proteins and cells interact in the development of animals and plants. Lectures feature an analysis of the current literature in developmental biology. Lectures will emphasize molecular, cellular, genetic aspects of developmental systems. Our goal is not to cover the field but to strength our understanding of key concepts in the field of developmental biology and to become familiar with current approaches taken in modern developmental biology research.

COURSE FORMAT: Three lecture hours per week, Mondays, Wednesdays and Fridays. The course consists of two sections. Section I consist of lectures by me/guest lecturers and discussions of research articles. Section II consist of presentations by students. Section II provides an opportunity for you to learn about a topic that's of interest to you.

INSTRUCTOR: Sophia L. Stone

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PREREQUISITE: BIOL 3050.03, BIOL 2020.03 and BIOL 2030.03

COURSE MATERIALS: There is no assigned text for this course. Course topics will be studied primarily in papers from current journals and review articles. Links to these papers will be made available on BLS. The text Principles of development (3rd edition) by Lewis Wolpert, Oxford University Press is recommended but not required. Lecture slides/notes will be made available on BLS.

Other useful resources:

- Mechanisms in Plant Development by Ottoline Leyser and Stephen Day, Blackwell Publishing.
- Developmental Biology (9th edition) by Scott F. Gilbert, Sinauer Associates Inc.
- Plant hormones Biosynthesis Signal transduction, Action by Peter J. Davies, Kluwer academic Press.

ASSESSMENT:

Mid-term Exam	20%
Presentations	40%
Writing Assignment	35%
Attendance and Participation	5%

Midterm exam: A midterm exam will be held following the completion of section I (lectures). The exam will cover lecture material and assigned readings (research/journal articles). All course material will be posted on BLS.

Presentations: During presentation weeks, student(s) will do presentations on a selected journal article/research paper followed by a discussion period. Students are expected to participate in the discussion following each presentation as this contributes to your final grade.

Writing assignment: Each student will write an article on a recent advance in plant or animal development of his or her own choosing. The article will highlight a recent study (published in 2008-2010) by putting the study within the context of the field and explaining why the study represents a recent advance.

Letter grade conversion:

A+ = 90-100; A = 85-89.9; A- = 80-84.9; B+ = 75-79.9; B = 70-74.9; B- = 65-69.9
C+ = 61-64.9; C = 58-60.9; C- = 54-57.9; D = 50-53.9; F = < 50

STUDENT ACCESSIBILITY SERVICES: Students may request accommodation as a result of barriers related to disability, religious obligation, or any characteristic under the Nova Scotia Human Rights Act. Students who require academic accommodation for either classroom participation or the writing of tests, quizzes and exams should make their request to the Office of Student Accessibility & Accommodation (OSAA) prior to or at the outset of each academic term. Please see www.studentaccessibility.dal.ca for more information. Students should also ensure that all appropriate documentation from SAS is given to me in a timely fashion.

REGULATIONS REGARDING MISSED EXAMINATIONS/ASSIGNMENTS:

The following statement is taken from <http://ug.cal.dal.ca/ACRG.htm> which outlines Academic regulations on missed exam and assignments.

At the discretion of the instructor, alternate arrangements for examinations, tests or the completion of assignments may be made for students who are ill, or in other exceptional circumstances.

Where illness is involved, a certificate from the student's physician will be required. This certificate should indicate the dates and duration of the illness, when possible should describe the impact it had on the student's ability to fulfill academic requirements, and should include any other information the physician considers relevant and appropriate. To obtain a medical certificate, students who miss examinations, tests or the completion of other assignments should contact the University Health Services or their physician at the time they are ill and should submit a medical certificate to their instructor as soon thereafter as possible. Such certificates

will not normally be accepted after a lapse of more than one week from the examination or assignment completion date.

For exceptional circumstances other than illness, appropriate documentation, depending on the situation, will be required. Requests for alternate arrangements should be made to the instructor in all cases.

Please see <http://ug.cal.dal.ca/ACRG.htm> for more details.

ACADEMIC INTEGRITY:

Dalhousie defines academic integrity as meaning that we are honest and accurate in creating and communicating all academic products. Acknowledgement of other people's work must be done in a way that does not leave the reader in any doubt as to whose work it is. Academic integrity means trustworthy conduct such as not cheating on examinations and not misrepresenting information. It is the student's responsibility to seek assistance to ensure that these standards are met.

You should be familiar with Dalhousie University policies on academic integrity as these policies will be followed for this course. Information of Dalhousie's policies can be found at....

- <http://academicintegrity.dal.ca>
- Pages 53-64 of your Academic Procedures handbook
- Pages 22-25 of your Undergraduate Calendar

LECTURE TOPICS (tentative!):

Note: topics may consists of one or a series of lectures

History of developmental biology (guest lecture)
Evolutionary developmental biology (guest lecture)
Development of the nervous system (guest lecture)
Ubiquitination and development
micoRNAs in development
Sex determination
Environmental regulation of plant development
Lessons to learn from plant regeneration