

subscribe for 180 days to an eBook format (the cheapest version). Relevant videos, research papers and reviews will be uploaded on Avenue.

LABORATORY MANUAL

Laboratory handouts will be available on Avenue to Learn.

STATEMENT FROM (AREB) REGARDING THE USE OF ANIMALS IN LAB

Some of the labs involve the use of animals for teaching purposes. These labs have been reviewed and approved by McMaster University's Animal Research Ethics Board (AREB). AREB is responsible for ensuring appropriate procurement, care and use of animals for research or teaching at all McMaster University affiliated Animal Facilities and Laboratories, including those located at Hamilton teaching hospitals under its jurisdiction. AREB follows guidelines and policy statements established by the Canadian Council on Animal Care (CCAC), and legislation as presented in the Animals for Research Act, Ontario (1980) and administered by the Ontario Ministry of Agriculture and Food and Rural Affairs (OMAFRA). The Board ensures that procedures commensurate with current veterinary standards outlined by the Canadian Association of Laboratory Animal Medicine to ensure that:

- Unnecessary pain or distress is avoided, and animal stress and injuries are avoided, whether during transfers of animals or in their normal quarters;
- Anaesthesia and analgesia are properly and effectively used; • Appropriate post-operative care is provided;
- All due consideration is given to animal welfare, including environmental enrichment; and
- Animal users and teaching assistants are properly trained and experienced in animal handling and procedures.

IMPORTANT NOTE:

This course involves mandatory laboratory exercises (attendance will be taken) involving the use of animals. In some of the exercises, animals will be killed (painlessly) either as part of the experiment, or to provide tissues for the experiment. IF YOU HAVE OBJECTIONS TO ANY OF THESE PROCEDURES, YOU SHOULD NOT TAKE THIS COURSE.

EVALUATION

25% - Midterm I Feb 1, in class
25% - Midterm II March 15, in class
30% - Final Exam (During final exam period)
18% - Laboratory Component
 Lab Report: *Drosophila* Lab
 Lab Report: *C elegans* Lab
 In Lab Participation 2%
2% - Online Avenue Participation

REQUESTS FOR RELIEF FOR MISSED ACADEMIC TERM WORK

If you are absent from the university for a minor medical/personal reason, lasting fewer than 3 days, you may report your absence, once per term, without documentation, using the McMaster Student Absence Form. Absences for a longer duration or for other reasons must be reported to your Faculty/Program office, with documentation, and relief from term work may not necessarily be granted.

Immediately after using the online tool, students **MUST contact Mihaela Georgescu (mgeorg@mcmaster.ca)** regarding the nature of the relief. Failure to do so may negate the opportunity for relief. **It is the prerogative of the instructor of the course to determine the appropriate relief for missed term work.**

ACADEMIC ACCOMMODATION OF STUDENTS WITH DISABILITIES

Students who require academic accommodation must contact Student Accessibility Services (SAS) to make arrangements with a Program Coordinator. Academic accommodations must be arranged for each term of study. Student Accessibility Services can be contacted by phone 905-525-9140 ext. 28652 or e-mail sas@mcmaster.ca. For further information, consult McMaster University's Policy for Academic Accommodation of Students with Disabilities. <http://www.mcmaster.ca/policy/Students-AcademicStudies/AcademicAccommodation-StudentsWithDisabilities.pdf>

Once your accommodation was being acknowledged by the instructor, please contact Mihaela Georgescu (mgeorg@mcmaster.ca) to discuss your accommodation needs in the course.

GRADES

Grades will be converted according to the scheme used at McMaster University.

90-100%	A+	12	63-66%	C	5
85-89%	A	11	60-62%	C-	4
80-84%	A-	10	57-59%	D+	3
77-79%	B+	9	53-56%	D	2
73-76%	B	8	50-52%	D-	1
70-72%	B-	7	0-49%	F	0
67-69%	C+	6			

ACADEMIC DISHONESTY

You are expected to exhibit honesty and use ethical behaviour in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and academic integrity. Academic dishonesty is to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behaviour can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: "Grade of F assigned for academic dishonesty"), and/or suspension or expulsion from the university. It is your responsibility to understand what constitutes academic dishonesty. For information on the various types of academic dishonesty please refer to the Academic Integrity Policy, located at <http://www.mcmaster.ca/academicintegrity>.

The following illustrates only three forms of academic dishonesty:

1. Plagiarism, e.g. the submission of work that is not one's own or for which other credit has been obtained.
2. Improper collaboration in group work. While we encourage you to work with your peers in solving problems on your assignments, copying of answers is not acceptable. Your final work must be your own.
3. Copying or using unauthorized aids in tests and examinations.

CHANGES TO THE COURSE OUTLINE

At certain points in the course it may make good sense to modify the course schedule. The instructor reserves the right to modify elements of the course and will notify students accordingly, both in class and on Avenue to Learn. Posted changes take precedence over this course outline. The University may change the dates and deadlines for any or all courses in extreme circumstances. If either type of modification becomes necessary, reasonable notice and communication with the students will be given with explanation and the opportunity to comment on changes. It is the responsibility of the student to check their McMaster email and course website (Avenue) regularly during the term and to note any changes.

Course Schedule *

Part I: The Developmental Biology Landscape			
Learning Objectives:			
<ol style="list-style-type: none"> 1. Examination of early events underlying the development of an organism from a single cell 2. Exploration of classical embryology experiments, as well as recent advances 3. Compare and contrast common model organisms in developmental biology 4. Review common and cutting edge techniques in developmental biology 			
Lecture	Date	Lab Topic/week	Lecture Topic
1	January 4		Introduction to Developmental Biology
2	January 8	No labs	A New Hope; Germ Cells and Fertilization
3	January 11		Famous Players; who we are and what we do
4	January 15	Intro lab	The Grand Plan; Early embryonic patterning
5	January 18		When we were young – early developmental stages
6	January 22	Sea urchin	Look Who’s Talking – cellular communication and cell signaling
7	January 25		Cell communication II – the organizer
8	January 29	No lab	TBA: Overflow/Case Study/Review
9	February 1		Midterm I – In Class
10	February 5	<i>Drosophila</i> I	The Most important time of your life - gastrulation
11	February 8		Gastrulation II
Part II: Organogenesis			
Learning Objectives:			
<ol style="list-style-type: none"> 1. Examination of cell type specification and tissue morphogenesis underlying organ development 2. Discussion of the concepts of differentiation, specification vs. commitment and determination, lineage dependent mosaic development vs. regulatory development 3. Review of modern developmental biology research underlying each topic 			
12	February 12	<i>Drosophila</i> II	If I only had a brain - early neural patterning and development
13	February 15		Neurodevelopment II – developing sight
Reading Week – No Classes			
14	February 26	Chick	Cells on the move – neural crest
15	March 1		Neural crest II – How the zebra gets its stripes
16	March 5	Zebra fish	It’s about time – somites and the segmentation clock
17	March 8		The who’s who - lineage specification
18	March 12	No lab	TBA: Overflow/Case Study/Review
19	March 15		Midterm II – In Class
20	March 19	<i>C.elegans</i> I	Have a heart - early cardiovascular development
21	March 22		Cardiovascular development II – form and function
22	March 26	<i>C.elegans</i> II	High Five – limb development and patterning

Part III: Current Topics in Developmental Biology

Learning Objectives:

1. Exploration of modern fields in applied developmental biology
2. Critical evaluation of modern research literature
3. Discussion of the impact of developmental biology research within current society

23	March 29	<i>C.elegans</i> II	From embryo to adult, stem cells in regeneration
24	April 2	No lab	Endless forms most beautiful – the science of Evo-Devo
25	April 5		Environment vs genetics – environmental contaminants and development
26	April 9		Review
Final Exam: During April Exam Period			

* The scheduling may be subject to change without prior notice at the instructor discretion

**Suggested readings will be posted on Avenue Prior to Lecture. Chapter and Page numbers refer to the 11th edition of the course text.

*** Due to the nature of labs involving live animals, sometimes the laboratory schedule does not go as planned. We may have to try some experiments and demonstrations again during the “no lab” weeks. We will notify you if that is the case.