

Department of Biology Course Outline

SC/BIOL 4061 3.00 Cell and Molecular Biology of Development
Winter 2016

Course Description

This course presents a genetic and molecular biological approach to the field of developmental biology. Topics range from unicellular systems, both prokaryotic and eukaryotic, to more complex, multicellular systems. Three lecture hours. One term. Three credits.

Prerequisites

SC/BIOL 2020 3.00, SC/BIOL 2021 3.00, SC/BIOL 2040 3.00, SC/BIOL 2070 3.00

Course Instructors and Contact Information

Course Director: John McDermott PhD
Office : 427 b Life Sciences Building
Office tel extension: 30344
Email address: jmcderm@yorku.ca
Web site: www.yorku.ca/jmcderm/

Schedule

Tues 1-2.30pm lecture
Thurs 1-2.30pm lecture
Office hours- to be announced

Evaluation

Evaluation Components of Final Grade and related information.

1 Mid term test (prior to Reading week -date Thurs 13 th Feb)	30%	
1 Essay (HARD COPY due date TBA)	30%	
1 Test (Final exam in exam period date -TBA)		40%

Important Dates

Mid-term test will take place in the week prior to Reading week. Precise date and time will be announced in class.

Essay will be due in the last week of classes (Precise date, time and drop off location will be announced in class.

NOTE: for additional important dates such as holidays, refer to the "Important Dates" section of the Registrar's Website at <http://www.yorku.ca/yorkweb/cs.htm>

Resources

Course Text: (*10th edition available in York bookstore*)

Developmental Biology

Companion web site: www.devbio.com

Scott F.Gilbert

Sinauer Associates, Inc

ISBN 0-87893-384-6

Learning Outcomes

Upon successful completion of this course, students should be able to:

Understand theoretical principles of the molecular and cellular basis of animal development.

Understand experimental approaches to the elucidation of principles of development

Begin to read and analyze primary literature pertaining to Animal Development.

Understand a number of core technologies and how they can be utilized in experimental design to test experimental ideas and/or hypotheses.

Course Content

Topic outline

- 1) Introduction to Molecular Analysis of Development
 - Descriptive embryology
 - Genetics and molecular biology
- 2) Programs and Regulatory Elements in DNA
- 3) Transcriptional Circuits- epigenetic regulation of gene expression
- 4) Gastrulation and early development- axis specification and formation
- 5) Features of Major Model Organisms- Mouse, Chick, Drosophila
- 6) Techniques for the study of Mouse Development: gene targeting technology
- 7) Receptors, Ligands
- 8) Cell-cell communication, Signaling Networks, Induction and Competence
- 9) Molecular Co-ordination of Cell Division and Differentiation (Myogenesis)
- 10) Focus on Paraxial Mesoderm, Somitogenesis and Patterning
- 11) Cell Death in Development
- 12) Lineage Generation
 - Embryonic and Adult Stem cell properties and lineage commitment
- 13) Cell Type Specification, Induction of pluripotency in stem cells (iPS)
- 14) Patterning in 1 and 2 Dimensions
- 15) Molecular and cellular basis of 3D Patterning
 - Heart development
- 16) Developmental mechanisms of evolutionary conservation and change

Experiential Education and E-Learning

Students will be expected to access on line resources for Developmental Biology literature such as Pub Med and will also be referred to online resources for genomic/ proteomic analysis. Links or resources for videos of developmental processes will be provided

Other Information

This is a 4th year evidence-based course so students are expected to read primary research literature to supplement the textbook.

Course Policies

Policies you set for your course – for example:

Policy for missed/late assignments, midterms, tests:

Missed/late assignments eg essay. 5% of mark will be deducted each day past the deadline.

Missed midterm. One make-up midterm will be given for students who miss the midterm with a valid reason. If the make –up exam is missed then the grade apportioned to the midterm will be transferred to the final exam.

Missed Final exams:

All students who miss the final examination must petition if they are seeking deferred standing. No student will be granted deferred standing by the instructor via a Deferred Standing Agreement Form (DSA). Students will have to seek deferred standing by submitting a petition to their home faculty. It will be the Petition Committee's decision whether deferred standing is granted and, if deferred standing is granted, this committee will also set the deadline for writing the deferred examination.

Recording Lectures:

Photographs or video recordings of any portion of the lectures (including slides) are PROHIBITED. Images and material presented are subject to Canadian copyright law.

Audio recordings are permitted provided they are used ONLY as a personal study aid, and are NOT sold, passed on to others or posted online. Remember the lectures are the intellectual property of the professor and cannot be distributed without permission.

University Policies

Academic Honesty and Integrity

York students are required to maintain the highest standards of academic honesty and they are subject to the Senate Policy on Academic Honesty (<http://secretariat-policies.info.yorku.ca/policies/academic-honesty-senate-policy-on/>). The Policy affirms the responsibility of faculty members to foster acceptable standards of academic conduct and of the student to abide by such standards.

There is also an academic integrity website with comprehensive information about academic honesty and how to find resources at York to help improve students' research and writing skills, and cope with University life. Students are expected to review the materials on the Academic Integrity website at - <http://www.yorku.ca/academicintegrity/>

Access/Disability

York University is committed to principles of respect, inclusion and equality of all persons with disabilities across campus. The University provides services for students with disabilities (including physical, medical, learning and psychiatric disabilities) needing accommodation related to teaching and evaluation methods/materials. These services are made available to students in all Faculties and programs at York University.

Students in need of these services are asked to register with disability services as early as possible to ensure that appropriate academic accommodation can be provided with advance notice. You are encouraged to schedule a time early in the term to meet with each professor to discuss your accommodation needs. Please note that registering with disabilities services and discussing your needs with your professors is necessary to avoid any impediment to receiving the necessary academic accommodations to meet your needs.

Additional information is available at the following websites:

Counselling & Disability Services - <http://cds.info.yorku.ca/>

Counselling & Disability Services at Glendon - <http://www.glendon.yorku.ca/counselling/personal.html>

York Accessibility Hub - <http://accessibilityhub.info.yorku.ca/>

Ethics Review Process

York students are subject to the York University *Policy for the Ethics Review Process for Research Involving Human Participants*. In particular, students proposing to undertake research involving human

participants (e.g., interviewing the director of a company or government agency, having students complete a questionnaire, etc.) are required to submit an *Application for Ethical Approval of Research Involving Human Participants* at least one month before you plan to begin the research. If you are in doubt as to whether this requirement applies to you, contact your Course Director immediately.

Religious Observance Accommodation

York University is committed to respecting the religious beliefs and practices of all members of the community, and making accommodations for observances of special significance to adherents. Should any of the dates specified in this syllabus for an in-class test or examination pose such a conflict for you, contact the Course Director within the first three weeks of class. Similarly, should an assignment to be completed in a lab, practicum placement, workshop, etc., scheduled later in the term pose such a conflict, contact the Course director immediately. Please note that to arrange an alternative date or time for an examination scheduled in the formal examination periods (December and April/May), students must complete an Examination Accommodation Form, which can be obtained from Student Client Services, Student Services Centre or online at

http://www.registrar.yorku.ca/pdf/exam_accommodation.pdf (PDF)

Student Conduct in Academic Situations

Students and instructors are expected to maintain a professional relationship characterized by courtesy and mutual respect. Moreover, it is the responsibility of the instructor to maintain an appropriate academic atmosphere in the classroom and other academic settings, and the responsibility of the student to cooperate in that endeavour. Further, the instructor is the best person to decide, in the first instance, whether such an atmosphere is present in the class. The policy and procedures governing disruptive and/or harassing behaviour by students in academic situations is available at - <http://secretariat-policies.info.yorku.ca/policies/disruptive-andor-harassing-behaviour-in-academic-situations-senate-policy/>