

**BIOM 3040 Course Outline
Medical Embryology
Winter 2012**

Course Coordinator

Dr. Ann Hahnel
Office: 3644 OVC
Phone extension: 58399
Email: ahahnel@uoguelph.ca

Lab Coordinator

Ann Maslen amaslen@uoguelph.ca

Teaching Assistants

Linsay Bergeron lbergero@uoguelph.ca
Amanda Kerr akerr01@uoguelph.ca
Jason Vieira jvieira@uoguelph.ca

Course Description

Lectures: Monday, Wednesday & Friday, 11:30-12:30 MAC 149

Lectures are designed to introduce you to the sequence of vertebrate development, terminology, concepts, major mechanisms and a selection of techniques for studying development.

Labs – All labs will be held in Room 3655 OVC.

Monday afternoon	2:30 – 5:20 PM
Tuesday morning	9:30 AM – 12:20 PM
Tuesday afternoon	2:30 – 5:20 PM

Labs will demonstrate normal development using whole mount specimen and microscope slides, as well as abnormal development through a selection of mutants. Students participate by identifying abnormal development and researching possible causes. There are additional lab assignments based on readings that are designed to expand student's appreciation of the larger field of embryology through examination of its history, ethical implications, and the contributions of model organisms.

Lab activities:

- 1) Slides and wholmount specimen of normal embryos with which you will learn to identify important stages and structures in development

- 2) Mutant embryo specimen from which you will identify malformations and associate them with developmental mechanisms
- 3) Live chicken embryos that you will dissect and stage
- 4) 1 page paper that is a critical reflection of the book *Mutants* by Armand Marie Leroi
- 5) Group presentation of a reproductive biotechnology and the ethical issues surrounding it
- 6) Group presentation of the use of a model organism in embryology
- 7) 2 page paper describing the effects of a mutation on the microscopic anatomy of a mouse embryo and discussing a possible cause

Please attend the lab in which you are registered unless you have permission from the Lab Coordinator. Assignments/exams will not be graded if you are not registered in the section you attend.

Evaluation: Students will be evaluated on the basis of both lecture and laboratory components. See schedule at end for dates when assignments are due.

	<u>% Final Grade</u>
Midterm Exam – in lecture room (lectures through heart)	15%
Final Exam – room TBA (lectures from pharyngeal arches) (slides & mutant specimen since mid-term)	30%

Lab

Midterm Lab Exam (Labs 3-5)	5%
Assignment 1	10% paper + 4% preliminary work
Assignment 2	10% paper + 2 % evaluation of presentations
Assignment 3	10% paper + 2 % evaluation of presentations
Assignment 4 (Due beginning lab 11)	12%

Texts & Reference Materials:

Required:

- 1) **Larsen's Human Embryology 4th ed.**, G. Schoenwolf et al.
- 2) **Mutants**, Armand Marie Leroi
- 3) **Bioethics and the New Embryology**, Scott F. Gilbert et al.

Recommended:

- 4) **Atlas of Chick and Pig Embryos** is recommended for labs. It is available online at Ares Course Reserve and for sale at the University bookstore, and there should be used copies.

- 5) **Veterinary Medical Embryology lab manual** is also a useful resource, and again is on reserve at the library or can be purchased through the University book store, and there should be used copies.
- 6) There are some great websites that illustrate embryological development. Some of these include:

www.visembryo.com

www.uoguelph.ca/zoology/devobio/

http://www.ucalgary.ca/UofC/eduweb/virtualembryo/db_tutorial.html

Additional websites may be referred to during lectures and labs.

Course/instructor evaluation

In the final few week of the course, you will be given the chance to evaluate the course and the instructors. This information is used each year to improve the course and the teaching methods and will have no impact on your grade.

Course Policies

If you are unable to meet a course requirement due to illness or compassionate reasons, please advise the course coordinator in writing (e-mail). Alternate arrangements for assignments will be negotiated. There is a single make-up midterm (class or lab) on Thursday, March 1, 2012 at 3:30 PM.

Students who are registered with CSD and anticipate having special needs for taking exams or performing assignments are **required** to contact the course coordinator within the first 2 weeks of classes. This is to give us time to make adjustments.

For information on regulations and procedures for Academic Considerations, see

<http://www.uoguelph.ca/regisrar/calendars/undergraduate/current/>

Academic misconduct

http://www.uoguelph.ca/undergrad_calendar/c08/c08-amisconduct.shtml

“Academic misconduct is behaviour that erodes the basis of mutual trust on which scholarly exchanges commonly rest, undermines the University’s exercise of its responsibility to evaluate students’ academic achievements, or restricts the University’s ability to accomplish its learning objectives. [It includes] misappropriation of others’ work, misrepresentation of personal performance and fraud, improper access to scholarly resources, and obstructing others in pursuit of their academic endeavours.”

Instructors have the right to use software to aid in the detection of plagiarism or copying and to examine students orally on submitted work. Academic misconduct will be reported.

Proposed Schedule

Please note that the course coordinator may alter the proposed schedule of lectures or labs in order to accommodate course material and review.

Wk	Date	Lecture	Text readings	Lab
1	Jan 9 - M	Introduction		Lab 1
	Jan 11 - W	Fertilization, Genome activation	Chapter 1 Chapter 2, pp 11-48	Introduction to labs Terminology & staging Intro to assignment 1 (Mutants)
	Jan 13 - F	Cleavage, commitment, imprinting		
2	Jan 16 - M	Sources of information - library		Lab 2
	Jan 18 - W	Bi-laminar embryo	Chapters 2 & 6	Discussion Chpts I & II Mutants Intro to assignment 2 (BioEthics)
	Jan 20 - F	Placentation, twinning		
3	Jan 23 - M	Gastrulation, induction, E to M transition	Chapter 3	Lab 3
	Jan 25 - W	Axes & L/R asymmetry		Discussion Chpts III & IV of Mutants
	Jan 27 - F	Neurulation, neural crest cells, Parts of neural tube	Chapters 4 & 8	Xenopus embryo sections Early mouse sections Placentas, umbilical cord, twins
4	Jan 30 - M	Somite formation, segmentation		
	Feb 1 - W	Folding, basic body plan, Re-segmentation		Lab 4
	Feb 3 - F	Vasculogenesis, angiogenesis	Chapter 12 Chapter 13, pp385-406 & 413-421	Discussion Chpts V & VI of Mutants Chick lab part 1, eggs and sections
5	Feb 6 - M	Heart 1		Lab 5
	Feb 8 - W	Heart 2		Discussion Chpts VII & VIII of Mutants
	Feb 10 - F	Pharyngeal arches	Chapter 16	Chick lab part 2, eggs and sections Heart mutant specimen

6	Feb 13 - M	Head skeleton		Assignment 1 due Lab Quiz (Labs 3, 4 & 5) Intro to assignment 3 (Models)
	Feb 15 - W	Catch-up		
	Feb 17 - F	Mid-term exam (material through heart)		
Feb 20-25		Winter Break		
7	Feb 27 - M	Mutagenesis		Lab 6 BioEthics talks (Groups 1 & 2) Craniofacial mutant specimen
	Feb 29 - W	CNS	Chapter 9	
	Mar 2 - F	CNS		
8	Mar 5 - M	PNS	Chapter 10	Lab 7 BioEthics talks (Groups 3, 4 & 5) Intro to assignment 4 (mouse mutants)
	Mar 7 - W	Eye/Ear	Chapter 17	
	Mar 9 - F	Respiratory & Cavities	Chapter 11	
9	Mar 12 - M	Respiratory & Cavities		
	Mar 14 - W	Limbs	Chapter 18	Lab 8 BioEthics talks (Group 6) Model organism talks (Groups 1 & 2)
	Mar 16 - F	Limbs		
10	Mar 19 - M	Urogenital	Chapter 15	Lab 9 Models organism talks (Groups 3 & 4) Limb & urogenital mutant specimen
	Mar 21 - W	Urogenital		
	Mar 23 - F	Urogenital		
11	Mar 26 - M	GI	Chapter 14	Lab 10 Model organism talks (Groups 5 & 6)
	Mar 28 - W	GI		
	Mar 30 - F	Eco/Evo/Devo		
12	Apr 2 - M	Techniques		Lab 11 Assignment 4 due Synopsis
	Apr 4 - F	Catch-up or Review		

Final Exam: 13 April (Friday) 8:30-10:30 – Will cover lectures & slides/mutant specimen since mid-terms.