



BIOM*3040 Medical Embryology

Winter 2020

Section(s): 01

Department of Biomedical Sciences

Credit Weight: 0.75

Version 1.00 - November 18, 2019

1 Course Details

1.1 Calendar Description

The patterns and principles of normal embryonic and fetal development of mammals are covered with an emphasis on comparison to adult anatomy and medical implications. In laboratories, the teratology of prenatal anomalies are also examined. There is a focus on gathering embryological information and developing scientific reasoning skills through essays and presentations.

Pre-Requisites: (BIOL*1070, BIOL*1090), (1 of BIOL*1080, BIOM*3200, HK*3810, HK*3940), (1 of BIOM*3010, HK*3401, HK*3501, ZOO*2090)

Restrictions: This is a Priority Access Course. Enrolment may be restricted to particular programs or specializations or semester levels during certain periods. Please see the department of Biomedical Sciences website for more information.

1.2 Timetable

Timetable is subject to change. Please see WebAdvisor for the latest information.

1.3 Final Exam

Exam time and location is subject to change. Please see WebAdvisor for the latest information.

2 Instructional Support

2.1 Instructional Support Team

Instructor: Laura Favetta Ph.D.
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Telephone: +1-519-824-4120 x56212
Office: OVC Rm 3621
Office Hours: Course Instructor and Coordinator

Lab Technician: Edgardo Reyes
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Office Hours: Lab Technician and Instructor

2.2 Teaching Assistants

Teaching Assistant: Jyoti Sharma
Email: jsharm02@uoguelph.ca

3 Learning Resources

3.1 Recommended Resources

Carlson, B.M. Human Embryology and Developmental Biology. 5 or 6th Edition. Elsevier Saunders. (Textbook)
 ISBN 978-1-4557-2794-0

Earlier editions may be used but all references made during lecture and laboratory will be from this edition.

4 Learning Outcomes

This course addresses the developmental events during all stages of prenatal development. This course will emphasize human development but with a comparative approach to illustrate key differences in embryological development across animals.

Students will study the normal cellular and molecular events associated with development. In addition, students will also examine abnormal development and teratological defects to understand how and why things go wrong during development. Through consideration of birth defects and teratology, the fundamental relationship between structure (anatomy) and function (physiology) will be considered, so that students gain an understanding of the fundamental importance of structure that allows normal physiology, and how anomalies in structure arising from abnormal development adversely affect the normal functioning of a structure.

The first part of the course is devoted to an introduction to embryology, gametogenesis, fertilization, and the development of embryo from zygote. The second part of the course examines the development of major organ systems in the embryo as well as a look into the

development of sensory organs. The lecture and laboratory components of the course are well integrated to provide students an excellent hands- on experience in embryology.

This course also emphasizes the development of transferrable skills such as microscopy as well as scientific writing skills.

4.1 Course Learning Outcomes

By the end of this course, you should be able to:

1. Identify and define key structural and molecular elements involved in each stage of human development, the precursors of each structure, and the functional significance of each structure.
 2. Construct a temporal sequence of key events in each developmental period.
 3. Explain and identify normal development of organs.
 4. Identify and explain anomalies in development through a comparison of normal and abnormal development.
 5. Accurately and effectively communicate scientific ideas through written assignments and reports within the lab.
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5 Teaching and Learning Activities

Lectures

Monday, Wednesday, Friday

11:30am - 12:20pm MacKinnon, Room 029

A 50-minute lecture will be given three times per week. Lecture notes and readings (powerpoint slides for the lecture) will be posted to CourseLink prior to each lecture as a PDF file to facilitate note-taking. Before the final exam, some lecture time will be devoted to providing a student-directed review of the key concepts presented within lecture and lab.

Laboratories

Monday 2:30pm - 5:20pm, Wednesday 2:30pm - 5:20pm

Room 3655, OVC (Ontario Veterinary College)

Laboratories are 3 hours long and cover many of the concepts and techniques taught in lecture. There is one teaching assistant assigned to each laboratory session. Attendance is mandatory to receive credit for assigned work.

5.1 Lecture

Week 1

Topics: Introduction & Welcome to Embryology!

Day: Jan 6

Week 1

Topics: The saga of the sex cells: Gametogenesis overview

Day: Jan 8

Week 1

Topics: Female sex cells: Oogenesis

Day: Jan 10

Week 2

Topics: Male sex cells: Spermatogenesis & Spermiogenesis

Day: Jan 13

Week 2

Topics: Transport of gametes & fertilization

Day: Jan 15

Week 2

Topics: The 1st week & 2nd week: Cleavage and Implantation -
Jyoti Sharma

Day: Jan 17

Week 3

Topics: Assisted Reproductive Technologies (ARTs) I

Day: Jan 20

Week 3

Topics: ART II

Day: Jan 22

Week 3

Topics: The 3rd week: Gastrulation

Day: Jan 24

Week 4

Topics: The 4th week old embryo: Neurulation

Day: Jan 27

Week 4

Topics: **Test #1**

Includes Lectures and Labs: Jan 6 - 27

Day: Jan 29

Week 4

Topics: The placenta and the fetal-maternal interaction - Reem Sabry

Day: Jan 31

Week 5

Topics: Critical Periods in Development

Day: Feb 3

Week 5

Topics: Nervous System - Part I

Day: Feb 5

Week 5

Topics: Nervous System - Part II

Day: Feb 7

Week 6

Topics: Muscle and Skeleton

Day: Feb 10

Week 6

Topics: Limbs

Day: Feb 12

Week 6

Topics: Regeneration - Dr. Matt Vickaryous

Day: Feb 14

Mon, Feb 18 - Fri, Feb 22

Topics: **Winter Break**

Week 7

Topics: Respiratory System

Day: Feb 24

Week 7

Topics: Digestive System I

Day: Feb 26

Week 7

Topics: **Test #2**

Includes Lectures and Labs: Jan 31 - Feb 24

Day: Feb 28

Week 8

Topics: Digestive System II

Day: Mar 2

Week 8

Topics: Cardiovascular System - Part I

Day: Mar 4

Week 8

Topics: **Class Cancelled**

Day: Mar 6

Week 9

Topics: Cardiovascular - Part II

Day: Mar 9

Week 9

Topics: Integument and its derivatives

Day: Mar 11

Week 9

Topics: Stem Cells -Dr. Sarah LePage

Day: Mar 13

Week 10

Topics: Urinary System

Day: Mar 16

Week 10

Topics: Genital System- Part I: Female

Day: Mar 18

Week 10

Topics: Genital System - Part II: Male - Dr. Tobi Oluwole

Day: Mar 20

Week 11

Topics: Teeth and Eyes

Day: Mar 23

Week 11

Topics: **Test # 3**

Includes Lectures and Labs: Feb 26 - March 20

Day: Mar 25

Week 11

Topics: Class Cancelled

Day: Mar 29

Week 12

Topics: Students Direct Review for Final Exam

Day: Mar 30

Week 12

Topics: No Classes

Day: Apr 1

Week 12

Topics: No Classes

Day: Apr 3

5.2 Lab

Week 2

Topics: LAB 1

Week 2

Introduction to Embryology and Microscopy -

Assignments due in class (Worth 2%)

Week 3

Topics: LAB 2

Week 3

Male and Female Reproductive Anatomy -

Assignment due in Lab 3 (Worth 6%)

Week 5

Topics: **LAB 3**

Week 5

Sperm Motility -

Assignment due in Lab 4 (Worth 8%)

Week 8

Topics: **LAB 4**

Week 8

Chick Embryo I

Week 9

Topics: **LAB 5**

Week 9

Chick Embryo II

Assignment due in Lab 6

(Worth 15%)

Week 11

Topics: **LAB 6**

Week 11

Bovine Uterus Ultrasound and Dissection

Assignment due in class

(Worth: 4%)

6 Assessments

Notes on Assessment:

Term tests and final exam:

The term tests and final exam will consist of a variety of types of questions including multiple choice, definitions, diagram labeling, and short answer questions.

The term tests will **not** be cumulative, however, the final exam **will be** cumulative and will cover all course material (lecture and laboratory).

There will be **3 term tests** during regular class time throughout the course. You must write at least 2 of the scheduled term tests. **There will be no make-up tests**, therefore a student can miss one term test without penalty to the final grade (although this is not at all endorsed; it is highly recommended that students write all three term tests). Term test grades (worth 30% of the final mark) will be based upon the 2 best term test grades (worth 15% each). The two best test marks will be used towards calculation of the final course grade.

Laboratory assignments:

Laboratory assignments are listed in the laboratory schedule and vary from in-class assignments due at the end of laboratory to take-home written assignments and full laboratory reports. Take-home and full laboratory reports are due at the start (2:35pm) of the laboratory session on the specified due date.

6.1 Assessment Details

Term tests (Best 2 out of 3) (30%)

Each test is worth 15%

Test #1: Wednesday, January 29, 2020

Test #2: Friday, February 28, 2020

Test #3: Wednesday, March 25, 2020

Laboratory assignments, full formal report (35%)

Throughout the term

Final Exam (35%)

Comprehensive; includes full semester

Date and Time : TBA

7 Course Statements

7.1 Assignment submission and late penalty

Students are expected to complete and submit their laboratory assignments on time. Assignments are due by 2:35pm during the next laboratory after the date assigned unless otherwise stated. Any late submissions will result in a late penalty of 25% per day (within 24 hours) with a mark of zero for assignments handed in more than 4 days (96 hours) after the due date.

7.2 Attendance

Students are expected to come to lecture and laboratory on time and turn cell phones to vibrate/silent so as not to disrupt other students or the instructor. Students that do not attend lab will not be able to submit the associated assignment for the missed lab.

7.3 CourseLink

Will be used extensively throughout BIOM*3040. Ensure to visit the site often!

- Course content – All lectures, the laboratory manual, and other content will be posted within the Content tab
- Announcements – Last minute changes or special announcements will be posted within the Newsfeed
- Discussion boards – These forums provide opportunities for students to ask questions and discuss what is being learned in lecture and lab. Please direct all course content-related questions to the appropriate forum – odds are that if you have that question then at least one other student in the class does too!
- Writeonline – This is an online writing resource used to support student development of scientific writing skills.

7.4 Electronic Etiquette

Laptop computers are permitted in the classroom, however, research has shown that these devices can be disruptive to the classroom environment if students are not engaging in course-related activities (such as note-taking). Please be considerate of your fellow peers and use laptops for course-related activities only while in the classroom. If a student is using a laptop for unrelated activities such as social media, emailing, or texting, and it is evident that fellow students are being disrupted, the lecturer reserves the right to ask the student to leave the classroom. We strive to create a positive, fun, and engaging learning environment for all students.

The use of electronic devices during the midterm or final exam is strictly prohibited.

7.5 Email Policy

I teach several courses here at the University of Guelph, so all emails from students must include your full name, student number, and course code. All emails will be replied to within 24-48 hours. during business days.

7.6 Remark policy

Term tests

Requests for re-evaluation of a term test must be made, in writing, to the coordinator within one week of return of the term test. Only tests that are written in pen will be considered for re-marking. All requests must include appropriate reasoning for why the student deserves additional marks. Please be aware that an **approval for a remark will result** in the whole test being remarked by Dr. Favetta. This may result in an increase, decrease, or no change in the original mark of the term test.

Laboratory assignments

Requests for re-evaluation of a laboratory assignment must be made to your TA within one week of return of the assignment. If issues are not resolved, the assignment will be submitted to Dr. Favetta for re-evaluation. **Please note that, as with the term test policy, a remark request may result in an increase, decrease, or no change in the original grade of the assignment.**

7.7 Religious observance

Information about the University of Guelph's policy on academic accommodation of religious obligations can be found online.

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

8 University Statements

8.1 Email Communication

As per university regulations, all students are required to check their e-mail account regularly: e-mail is the official route of communication between the University and its students.

8.2 When You Cannot Meet a Course Requirement

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. The grounds for Academic Consideration are detailed in the Undergraduate and Graduate Calendars.

Undergraduate Calendar - Academic Consideration and Appeals

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml>

Graduate Calendar - Grounds for Academic Consideration

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml>

Associate Diploma Calendar - Academic Consideration, Appeals and Petitions

<https://www.uoguelph.ca/registrar/calendars/diploma/current/index.shtml>

8.3 Drop Date

Students will have until the last day of classes to drop courses without academic penalty. The deadline to drop two-semester courses will be the last day of classes in the second semester. This applies to all students (undergraduate, graduate and diploma) except for Doctor of Veterinary Medicine and Associate Diploma in Veterinary Technology (conventional and alternative delivery) students. The regulations and procedures for course registration are available in their respective Academic Calendars.

Undergraduate Calendar - Dropping Courses

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml>

Graduate Calendar - Registration Changes

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/genreg-reg-regchg.shtml>

Associate Diploma Calendar - Dropping Courses

<https://www.uoguelph.ca/registrar/calendars/diploma/current/c08/c08-drop.shtml>

8.4 Copies of Out-of-class Assignments

Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

8.5 Accessibility

The University promotes the full participation of students who experience disabilities in their academic programs. To that end, the provision of academic accommodation is a shared responsibility between the University and the student.

When accommodations are needed, the student is required to first register with Student Accessibility Services (SAS). Documentation to substantiate the existence of a disability is required; however, interim accommodations may be possible while that process is underway.

Accommodations are available for both permanent and temporary disabilities. It should be noted that common illnesses such as a cold or the flu do not constitute a disability.

Use of the SAS Exam Centre requires students to book their exams at least 7 days in advance and not later than the 40th Class Day.

For Guelph students, information can be found on the SAS website

<https://www.uoguelph.ca/sas>

For Ridgetown students, information can be found on the Ridgetown SAS website
<https://www.ridgetownc.com/services/accessibilityservices.cfm>

8.6 Academic Integrity

The University of Guelph is committed to upholding the highest standards of academic integrity, and it is the responsibility of all members of the University community-faculty, staff, and students-to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff, and students have the responsibility of supporting an environment that encourages academic integrity. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

Undergraduate Calendar - Academic Misconduct

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml>

Graduate Calendar - Academic Misconduct

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml>

8.7 Recording of Materials

Presentations that are made in relation to course work - including lectures - cannot be recorded or copied without the permission of the presenter, whether the instructor, a student, or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

8.8 Resources

The Academic Calendars are the source of information about the University of Guelph's procedures, policies, and regulations that apply to undergraduate, graduate, and diploma programs.

Academic Calendars

<https://www.uoguelph.ca/academics/calendars>