

**Life Sciences 3L03**  
**Laboratory Methods in Life Sciences**  
**Fall 2017**

**ADMINISTRATIVE DETAILS**

**LEAD INSTRUCTOR:**

Dr. Rosa da Silva

Office: LSB 540

Email: rosa.dasilva@mcmaster.ca

**MODULE INSTRUCTORS:**

Dr. Rosa da Silva

Dr. Sunita Nadella

Dr. Kim Dej

Mr. Ryan Belowitz

**LABORATORY INSTRUCTIONAL ASSISTANT:**

Ryan Belowitz

Office: ABB 119A

Email: belowir@mcmaster.ca

**LABORATORY TECHNICIAN**

Geneviève van Wersch

**COURSE OBJECTIVES**

**COURSE DESCRIPTION:**

In this inquiry-based laboratory course, we will utilize model organisms to investigate fundamental processes of human development. Specifically, students will utilize techniques in histology, cytology, genetics, and physiology to evaluate the changes that occur during our developmental timelines. We will also examine how environmental toxins can alter our developmental processes and lead to teratological or disease outcomes in a developing human.

**COURSE AIMS:**

In this course, students will have the opportunity to:

- Utilize model organisms to investigate processes of human development
- Combine multiple approaches in research methodologies to answer questions pertaining to human development
- Develop advanced skills in experimental design
- Gain proficiency in scientific data analysis
- Engage in the communication of research in the Life Sciences to multiple audiences

**MATERIALS AND FEES**

**TEXTBOOK:**

There is no required textbook for this course. Required readings will be provided for each lecture.

**ONLINE CONTENT:**

This course uses Avenue to Learn to post the course outline, assignments, and other notices. Go to

<http://avenue.mcmaster.ca> to find out how to log-on to the course's platform.

**COURSE OVERVIEW AND ASSESSMENT****SCHEDULE (SEE 'LS3L03 CONTENT SCHEDULE' POSTED TO AVENUE SEPARATELY)**

- The course is divided into 4 modules (*listed below*)
- Every module will begin with a **lecture on Wednesday** (50 minutes) that will introduce the topic.
- Your two **lab** sections will be scheduled on Monday and Thursday or Tuesday and Friday. Each lab section is scheduled for 1 hour and 50 minutes.

**NOTE: Your lab scheduling is tied so that you are in the same lab as your group partners in each lab section.**

**Modules include a focus on human development in the following areas:**

- *Histological studies of developing tissues*-gametogenesis
- *Physiology of developmental processes*- respiration, cardiac activity and metabolic rates
- *Cytology and genetics*- chromosome analysis and markers for paternity testing
- *Toxicology*- impacts of essential and non-essential metals and toxins on development

**EVALUATION:**

- Labs will be preceded by online quizzes that will prepare you for the lab techniques used for the modules
- Working in groups of four, you will maintain a collaborative electronic lab notebook (ELN) in which you will collect, analyze, and summarize data and plan future experiments
- There will be four group assignments related to the labs you complete
- There will be two opportunities to prepare laboratory reports. One will be completed with your group at the start of the term and one will be completed on your own, to be submitted at the end of the course
- There will be two practical tests that you will complete individually. These tests will cover both the lecture and lab material, and will especially allow you to demonstrate your laboratory and analytical skills
- There will be opportunities for reflection and discussion on laboratory activities

At certain points in the course it may make good sense to modify the schedule and deadlines outlined below. The instructor reserves the right to modify elements of the

course and will notify students accordingly (in class and labs, and post any changes to Avenue.

Assessments	Weight
<b><u>Quizzes (individual)</u></b> Q1 (no grade) Q2-Q9	<b>Total: /10%</b> lowest quiz grade dropped The top 7 quizzes contribute equally to the total quiz grade /10%
<b><u>Electronic Lab Notebook 'ELN' (group)</u></b> ELN 1 (no grade) ELN 2-10	<b>Total: /10%</b> ELNs 2-10 contribute equally to the total ELN grade /10%
<b><u>Assignments (group)</u></b> A1 (no grade) A2-4	<b>Total /20%</b> /5% each
<b><u>Lab Reports (group and individual)</u></b> R1 (group) R2 (individual)	<b>Total: /25%</b> /10% /15%
<b><u>Practical Lab Tests (individual)</u></b> T1 T2	<b>Total: /30%</b> See note below for grade breakdown
<b><u>Reflection (individual)</u></b>	<b>Total: /5%</b>

#### **POLICY ON MISSED WORK, EXTENSIONS AND LATE PENALTIES:**

We recognize that the use and reliance on the MSAF by students is closely tied with both stress and time management. With that in mind, we have developed a more flexible grading scheme to help you plan and manage both stress and time. This reflects our commitment to Universal Instructional Design Principles as well as McMaster's Forward with FLEXibity, which 'aims to enhance accessibility and to equitably meet the learning needs of a diverse student body'

#### **Quizzes**

Quizzes are completed individually on Avenue.

Each of the eight quizzes will be graded /100%. The top 7/8 grades will be used to calculate your total quiz grade, which is weighted at 10% of the final grade. MSAFs are not required or accepted for the quizzes. There will be no make-up quizzes, and we will not accommodate more than one dropped quiz grade.

#### **ELNs**

ELNs are completed in your group's Google Doc, which is shared with your TA at the beginning of term. Updates to your ELN will occur in real time on the Google Doc.

ELNs can be worked on for up to 48 hours after the due date with no late penalty applied and no MSAF required. The ELN will be graded as it appears in the Google Doc starting 48 hours after the lab ends. MSAFs are not required or accepted for the

ELNs, and we will not provide additional accommodation for ELNs beyond the 48-hour grace period.

### **Assignments**

Assignments are submitted as a PDF by one member of your group to your 'Group Assignment Folder' on Avenue.

Group assignments can be submitted up to 48 hours after the due date with no late penalty applied and no MSAF required. Group assignments not submitted within 48 hours of the due date will receive a grade of zero. Assignments submitted late may not receive feedback in time for test preparation. MSAFs are not required or accepted for the group assignments, and we will not provide additional accommodation for assignments beyond the 48-hour grace period.

### **Missed Labs**

Attendance at all labs is mandatory. You likely won't be given an opportunity to make-up the missed lab experience, which is testable on the practical lab tests. If you miss a lab, you are accountable to your group. At the beginning of the year, you and your group will complete a group contract that outlines how your group will organize itself, work, communicate and deal with issues such as absences of group members. If you are away for a week and can't contribute to the group assignment or ELN, you are responsible for following up with your group and determining how you will make up for the missed contributions. There will also be peer evaluations for the ELNs and assignments, where a negative evaluation could result in a lower grade on the assignments and/or ELNs compared to other members in your group.

When deciding on your group's approach for distributing workloads and completing the assignments, be aware that any of the lab/assignment material is considered testable for the lab practicums, which are completed individually.

### **Lab Reports**

The group lab report is submitted as a PDF by one member of your group to your 'Group Assignment Folder' on Avenue. The individual lab report is submitted as a PDF to your 'Individual Lab Report' assignment folder on Avenue.

Lab reports submitted by the due date will receive both feedback and a grade. You may submit your lab report up to 7 days late with no late penalty applied and no MSAF required. If you submit during the 7-day grace period, you will receive a grade but there will be no feedback provided by the TAs. Lab reports not submitted within 7 days of the due date will receive a grade of zero. MSAFs are not accepted or required for the lab reports, and we will not provide additional accommodations beyond the 7-day grace period.

### **Practical Lab Tests**

If you miss a lab test, you must submit an MSAF and contact the Instructional Assistant. Please see '**REQUESTS FOR RELIEF FOR MISSED ACADEMIC TERM WORK**' for details.

Both lab tests will consist of multiple choice (MC) and short answer (SA) questions. If you do not submit an MSAF and write both tests during your normally scheduled time, the test grade will be calculated as follows:

Scheme A: Test 1 = /10% and Test 2 = /20%

Scheme B: Test 1 = /20% and Test 2 = /10%

Test Grade (/30%): the greater of scheme A and B

If you submit an MSAF for either one of the tests, you will complete a cumulative make up practical lab test at the end of the semester at a date and time TBA. The test will be completed in the Living Systems Lab space. Those that submit an MSAF and miss one of the tests will have their test grade calculated as follows:

Test Grade (/30%): Test 1 or 2 = 15% and Make-up test = 15%

### **Reflections and E-portfolio**

Reflections are completed individually on PebblePad, and submitted as a PDF on Avenue to the appropriate assignment folder. Reflections also need to be added to your E-portfolio and shared with the TA. Details on sharing the E-portfolio will be provided.

Reflections submitted by the due date will receive both feedback and a grade. You may submit your reflection up to 7 days late with no late penalty applied and no MSAF required. If you submit during the 7-day grace period, you will receive a grade but there will be no feedback provided by the TAs. MSASFs are not accepted or required for the reflections, and we will not provide additional accommodations beyond the 7-day grace period.

### **REQUESTS FOR RELIEF FOR MISSED ACADEMIC TERM WORK:**

If you are absent from the university for a minor medical 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.

When using the MSAF, enter the Instructional Assistant (Ryan Belowitz) and email (belowir@mcmaster.ca) as the contact for the course. Refer to 'Life Sci 3L03 Flexible Grading and MSAF Policy' in the course syllabus to learn what the accommodation is for missed course work, and whether an MSAF is required or accepted. Most course work already has an accommodation provided that does not require the submission of an MSAF. In those cases, additional accommodation will not be granted, even with the submission of an MSAF.

If the missed work (e.g. test) requires the submission of an MSAF, you must contact the Instructional Assistant immediately after the MSAF is submitted.

### **DEADLINES:**

ASSESSMENT	TOPIC	OPEN	CLOSE
QUIZ 1	MODULE 0: ICE BREAKER	SEPT 7 8:30AM	SEPT 10 11:59PM
QUIZ 2	MODULE 0: SKILLS LAB	SEPT 8 5:30PM	SEPT 11 8:30AM
QUIZ 3	MODULE 1: HISTOLOGY 1 AND 2	SEPT 11 8:30AM	SEPT 14 8:30AM
QUIZ 4	MODULE 2: PHYSIOLOGY 1	SEPT 25 8:30AM	SEPT 28 8:30AM
QUIZ 5	MODULE 2: PHYSIOLOGY 2	OCT 2 8:30AM	OCT 5 8:30AM
QUIZ 6	MODULE 3: CYTOLOGY & GENETICS 1	OCT 23 8:30AM	OCT 26 8:30AM
QUIZ 7	MODULE 3: CYTOLOGY & GENETICS 2	OCT 30 8:30AM	NOV 2 8:30AM
QUIZ 8	MODULE 4: TOXICOLOGY 1	NOV 6 8:30AM	NOV 9 8:30AM
QUIZ 9	MODULE 4: TOXICOLOGY 2	NOV 13 8:30AM	NOV 16 8:30AM

ASSESSMENT	TOPIC	DUE DATE* FOR L01, L02, L03, L04 AND L09	DUE DATE* FOR L05, L06, L07, L08
ELN 1	MODULE 0: ICE BREAKER	SEPT 7, END OF LAB	SEPT 8, END OF LAB
ELN 2	MODULE 0: SKILLS LAB	SEPT 18, END OF LAB	SEPT 19, END OF LAB
ELN 3	MODULE 1: HISTOLOGY 1	SEPT 18, END OF LAB	SEPT 19, END OF LAB
ELN 4	MODULE 1: HISTOLOGY 2	SEPT 25, END OF LAB	SEPT 26, END OF LAB
ELN 5	MODULE 2: PHYSIOLOGY 1	OCT 2, END OF LAB	OCT 3, END OF LAB
ELN 6	MODULE 2: PHYSIOLOGY 2	OCT 16, END OF LAB	OCT 17, END OF LAB
ELN 7	MODULE 3: CYTOLOGY & GENETICS 1	OCT 30, END OF LAB	OCT 31, END OF LAB
ELN 8	MODULE 3: CYTOLOGY & GENETICS 2	NOV 6, END OF LAB	NOV 7, END OF LAB
ELN 9	MODULE 4: TOXICOLOGY 1	NOV 9, END OF LAB	NOV 10, END OF LAB
ELN 10	MODULE 4: TOXICOLOGY 2	NOV 20, END OF LAB	NOV 21, END OF LAB
*48 HOUR GRACE PERIOD AFTER THIS DATE AND TIME, NO LATE PENALTY			

ASSESSMENT	TOPIC	DUE DATE	NO LATE PENALTY IF SUBMITTED BY*:
LAB REPORT	MODULE 2: PHYSIOLOGY 1	OCT 17, 11:59PM	OCT 24, 11:59PM

(GROUP)			
LAB REPORT (INDIVIDUAL)	MODULE 4: TOXICOLOGY 1 AND 2	DEC 3, 11:59PM	DEC 10, 11:59PM
ASSIGNMENT 1	MODULE 1: HISTOLOGY 1 AND 2	OCT 3, 11:59PM	OCT 5, 11:59 PM
ASSIGNMENT 2	MODULE 2: PHYSIOLOGY 2	OCT 20, 11:59PM	OCT 22, 11:59 PM
ASSIGNMENT 3	MODULE 3: CYTOLOGY & GENETICS 1	NOV 7, 11:59PM	NOV 9, 11:59 PM
ASSIGNMENT 4	MODULE 3: CYTOLOGY & GENETICS 2	NOV 14, 11:59PM	NOV 16, 11:59PM
REFLECTION	TBA	TBA	TBA
*GRADE OF ZERO IF SUBMITTED AFTER THIS DATE AND TIME			

### ADDITIONAL STATEMENTS

#### **ACADEMIC INTEGRITY:**

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:

- Plagiarism, e.g. the submission of work that is not one's own or for which other credit has been obtained.
- 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.
- Copying or using unauthorized aids in tests and examinations.

#### **USE OF TURNITIN.COM:**

In this course we may be using a web-based service (Turnitin.com) to reveal plagiarism. Students will be expected to submit their work electronically to Turnitin.com and in hard copy so that it can be checked for academic dishonesty. Students who do not wish to submit their work to Turnitin.com must still submit a copy to the instructor. No penalty will be assigned to a student who does not submit

work to Turnitin.com. All submitted work is subject to normal verification that standards of academic integrity have been upheld (e.g., on-line search, etc.). To see the Turnitin.com Policy, please go to [www.mcmaster.ca/academicintegrity](http://www.mcmaster.ca/academicintegrity).

#### **ACADEMIC ACCOMMODATIONS 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](mailto:sas@mcmaster.ca). For further information, consult McMaster University's Policy for [Academic Accommodation of Students with Disabilities](#).

#### **GRADES:**

Grades obtained in Life Science 3L03 will be converted according to the scheme generally used at McMaster University which can be viewed here:

<http://registrar.mcmaster.ca/exams/grades/>

When the final marks are obtained, ALL borderline cases will be reviewed and, where warranted, adjustments will be made in the final mark.

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