Department of Micobiology, University of Manitoba

MBIO 3600 – Molecular Microbiology Techniques

Fall Term 2022

Course Details

Course Number & Title: MBIO3600 – Molecular Microbiology Techniques

Section & CRN: A01, TBA

Course Schedule: Monday/Wednesday, 14:30 to 17:25

Location for Lectures: 205 Armes

Location for Lab: 225 Buller Building

Prerequisites: Prerequisites: [MBIO 3410 or MBIO 3411]; and [(MBIO 2710, MBIO 2711, CHEM 2710, or CHEM 2711) and (CHEM 2720 or CHEM 2721)] or [one of the former MBIO 2370, the former MBIO 2371, the former CHEM 2370, or the former CHEM 2371]. May not be held with MBIO 3601, the former MBIO 4600, the former MBIO 4601, or MBIO 4030 when titled Advanced Microbial Genetics Lab.

Instructor Contact Information

Instructors: Dr. Damien Rivers & Dr. Aleeza Gerstein

Office Location: 225 Buller Building & 364 Machray Hall

Email: Damien.Rivers@umanitoba.ca & Aleeza.Gerstein@umanitoba.ca

Office Hours: Hours to be determined and by request

Course Description

This is a lab-based course, intended to teach the fundamental techniques required to work in a modern molecular microbiology lab. In addition to teaching a thorough understanding of the theory underpinning the techniques introduced in this course, evaluation will be carried out with a heavy emphasis on successfully carrying out each protocol and communication of results. Where applicable, technique will be assessed. This course will give students experience will scientific writing and communication.

Course Evaluation and Grading Scheme

Final Mark: The final mark for the course will be obtained from the following:

Hands-on technical marks	30%
Scientific manuscript - first draft	5%
Peer review	10%
Scientific manuscript - final draft*	35%
Final exam*	20%

*A passing grade is required on both the final draft of the scientific mauscript and the final exam to pass the course.

Letter Grade: The following cutoffs are typically used when assigning letter grades:

Letter Grade	Mark out of 100
A+	95-100
A	85-94
B+	80-84
B	70-79
C+	65-69
C	55-64
D	50-54
F	below 50

Letter grades are assigned taking into consideration the grade distribution in the class and the University of Manitoba's descriptors: A+ (Outstanding), A (Excellent), B+ (Very Good), B (Good), C+ (Satisfactory), C (Adequate), D (Marginal), F (Failure)
See `http://umanitoba.ca/student/records/grades/686.html` for more information.

Lower thresholds for some letter grades may be used if they are deemed more appropriate. Higher thresholds will not be used.

Important Dates

The following dates are important to how the course will progress throughout the term.

Date	Information
September 7	First lecture
September 19	First day of in-lab work
October 10	Rememberance Day
November 7-11	Fall term break
November 22	Last day for VW
December 12	Last day of class
December ?	Final exam (scheduled by registrars office)

Course Policies

Late assignments:
No marks will be given for either a late first draft of the scientific manuscript or late peer review. The grade of the final draft of the scientific mauscript will be penalized 10% per day to a maximum of five days. i.e, if you turn it in on the Monday after it is due, you will lose 20%. Note that a passing grade in the class requires at least 50% on the final exam and the final manuscript.

Covid mitigation:
Per the University policy, KN95 masks or 3-ply medical masks (minimum ASTM Grade 2) must be worn at all times. *We strongly recommend N95 (or similar) masks*. Please note this means a cloth mask (or 2-ply surgical mask) is not sufficient to participate in class activities.

Excused absences:
Will be considered on a case-by-case basis. Please contact the relevant professor as soon as you are able. We will work with you to ensure that you will not lose marks for illness.

Emails:
The University requires all students to activate an official U of M email account, which should be used for all communications between yourself and the university, including all your instructors. Emails sent to instructors from an email account other than the University of Manitoba account will automatically be deleted. All email communications should comply with the University's policy on electronic communication with students, which can be found at: `http://umanitoba.ca/admin/governance/governing_documents/community/electronic_communication_with_students_policy.html`

Photo policy:
Image captures of slides/overhead material is strictly for personal use only (copyright). Please do not include the instructor and/or classmates in the image. Posting of images that include lecture material and/or the instructor/classmates on the internet is strictly prohibited.

Audio/Video recording policy:
Prior consent must be obtained from the instructor to record the lecture. Students with disabilities are directed to Student Accessibility Services to facilitate the implementation of accommodations. Course instructors are willing to meet with students to discuss the accommodations recommended by Student Accessibility Services.

Copyrighted Materials:
We will use copyrighted content in this course. The content used is appropriately acknowledged and is copied in accordance with copyright laws and University guidelines. Copyrighted works, including those created by instructors, are made available for private study and research and must not be distributed in any format without permission.
More details are available online at `http://umanitoba.ca/copyright/`.

Technology in the Classroom:
It is the general University of Manitoba policy that all technology resources are to be used in a responsible, efficient, ethical and legal manner. Students should restrict their use of technology to those approved by the instructor and/or University of Manitoba Accessibility Services *for educational purposes only.* Electronic messaging, email, social networking, gaming, etc. should be avoided during class time. Cell phones should be on silent. If a student is on call for emergencies, their cell phone should be on vibrate mode and the student should leave the classroom before using it. It is against biosafety protocol to use personal devices at the lab bench.

Academic Integrity:
Students are encouraged to discuss course material, including assignments and the final project. However, each student must hand in his or her own copy of each assignment/project and conduct the work independently unless otherwise specified. Please remember that group projects are subject to the rules of academic dishonesty and every group member must ensure that a group project adheres to the principles of academic integrity. Copying from anywhere, including other students, books, or the internet constitutes a case of academic dishonesty and could have serious consequences.

The goal in this class (as in all academic pursuits) is to learn. If you are unclear on what is acceptable or what constitutes plagiarism, please ask for clarification before turning in an assignment. Guidelines are stated in your calendar regarding University policy with respect to academic dishonesty and behavior (particularly plagiarism and cheating), as well as policies regarding absence from final exams.
`http://umanitoba.ca/faculties/science/undergrad/resources/webdisciplinedocuments.html`

Tentative schedule

Week 1 & 2	**September 7–16th**
Lab slot 1 (Wednesday)	Syllabus
	Introduction to the lab: Rules and safety
	Introduction to Study I and II
	Where to find needed supplemental resources
	Information to help students carry out the lab assignments, etc.
Lab slot 2 (Monday)	Scientific communication I: Telling a story
Lab slot 3 (Wednesday)	Scientific communication II: Methods and Results
Week 3	**September 19–23th**
Lab slot 4 (Monday)	Intro to small volume measurements
Lab slot 5 (Wednesday)	Study I, Step I: Culture induction and sampling
Week 4	**September 26–30th**
(Monday)	Data sheet due: Introduction to small volume measurements
Lab slot 6 (Monday)	Study I, Step II: RNA extraction
	Study II, Step I: Part A: Tn5 Mutagenesis via Carrier pRK602
Lab slot 7 (Wednesday)	Study I, Step III: cDNA synthesis
	Study II, Step I : Part A: Tn5 Mutagenesis via Carrier pRK602 (con't)
(Friday)	Data sheet due: Study II, Step I
Week 5	**October 3–October 7**
(Monday)	Data sheet due: Study I, Step II: RNA extraction
Lab slot 8 (Monday)	Study I, Step IV: qRT-PCR
	Study II, Step I : Part A: Tn5 Mutagenesis via Carrier pRK602 (con't)
Lab slot 9 (Wednesday)	Study II, Step I : Part A: Tn5 Mutagenesis via Carrier pRK602 (con't)
Week 6	**October 10–14th**
	Monday the 10th is Thanksgiving
(Tuesday)	Data sheet due: Study I, Step IV: qRT-PCR
Lab slot 10 (Wednesday)	Scientific communication III: Writing an Introduction
(Friday)	Visualization and figure caption due from Study I, Step IV: qRT-PCR data
Week 7	**October 17–21th**
Lab slot 10 (Monday)	Study I, Step V: Determination of LacZ protein production
Lab slot 11 (Wednesday)	Study I, Step V: Determination of LacZ protein production (con't)
Week 8	**October 24–28th**
(Monday)	Data sheet due: Study I, Step V
Lab slot 12 (Monday)	Study I, Step VI: Sequencing lacZ region to determine the genotype
	Study II, Step II : Arbitrary PCR
Lab slot 13 (Wednesday)	Study I, Step VI: Sequencing lacZ region to determine the genotype (con't)
	Study II, Step II : Arbitrary PCR (con't)
	End of data collection for manuscript
Week 9	**October 31–November 4st**
Lab slot 15 (Monday)	Scientific communication IV: Writing a discussion
	Scientific communication V: Style & Revision
Lab slot 16 (Wednesday)	Study II, Step II: Arbitrary PCR (con't)
(Friday)	Data sheet due: Study I, Step VI

Tentative schedule, continued

Reading Week	November 7–11th
Week 10	**November 14–18th**
(Monday)	Study II, Step III:Generalized Transduction of the Tn5
	*note this is to be done on your own time, lab will be open 9:30-16:30
Lab slot 16 (Monday)	Study II, Step III: Generalized Transduction of the Tn5 (con't)
Lab slot 17 (Wednesday)	Study II, Step III: Generalized Transduction of the Tn5 (con't)
(Friday)	Data sheet due: Study II, Step II
Week 11	**November 21–November 25th**
Lab slot 18 (Monday)	Study II, Step III: Generalized Transduction of the Tn5 (con't)
Lab slot 19 (Wednesday)	Study II, Step IV: Identification of a complementing Plasmid
	Study II, Step V : PCR-Based Site-Directed Mutagenesis
	Scientific communication VI: Providing feedback
	Draft manuscripts due; handed out for peer review assignment
Week 12	**November 28–December 2nd**
(Monday)	Data sheet due: Study II, Step III
	Study II, Step IV
Lab slot 20 (Monday)	Study II, Step V: PCR-Based Site-Directed Mutagenesis (con't)
	Peer review assignment due
Lab slot 21 (Wednesday)	Study II, Step V : PCR-Based Site-Directed Mutagenesis (cont)
Friday	Image plates and move to cold box
	*note this is to be done on your own time, lab will be open 9:30-16:30
Week 13	**December 5–9th**
Lab slot 22 (Monday)	Study II, Step V: PCR-Based Site-Directed Mutagenesis (con't)
	Study II, Step VI: Complementation analysis
Lab slot 23 (Wednesday)	Study II, Step VI: Complementation analysis (con't)
Week 14	**December 12th**
(Monday)	Data sheet due: Study II, Step V
Lab slot 24 (Monday)	Study II, Step VI : Complementation analysis (con't)
(Friday)	Data sheet due: Study II, Step VI
	Scientific manuscript due

ROASS Schedule A

Schedule "A" of the *Responsibilities of Academic Staff with regards to Students* (ROASS) policies of the University of Manitoba lists resources and policies for students. It is important that you familiarize yourself with these resources and policies. This document is available here: `http://umanitoba.ca/centre-advancement-teaching-learning/sites/centre-advancement-teaching-learning/files/2021-05/Text-for-Schedule-A-ROASS-July-27-2020.pdf`.

University of Manitoba Acknowledgement of Traditional Territories

The University of Manitoba campuses are located on original lands of Anishinaabeg, Cree, Oji-Cree, Dakota, and Dene peoples, and on the homeland of the Métis Nation.

We respect the Treaties that were made on these territories, we acknowledge the harms and mistakes of the past, and we dedicate ourselves to move forward in partnership with Indigenous communities in a spirit of reconciliation and collaboration.