MBIO 4530 Microbiology Project Research Course 2020-2021

Coordinator: Dr. Ann Karen Brassinga [Tel: 204-799-8457; Buller 418/420; Email: Ann.Brassinga@umanitoba.ca]
Fall term facilitator: Dr. Aleeza Gerstein [Tel: 204-272-1681; Email: Aleeza.Gerstein@umanitoba.ca]

Eligible students: This course is a required component of Microbiology Honours degree program. It can also be used in place of BGEN 4010 requirement for Genetics Honours, or in place of CHEM 4710 requirement for Biochemistry Honours, degree programs. ***For the 2020-2021 academic year, registration in MBIO 4530 is restricted to Microbiology, Genetics, and Biochemistry Honours students only.***

Course Description and Expectations: Students will learn to independently conduct experiments, analyze/interpret data/results and gain scientific writing skills under mentorship of their selected supervisor, and the course facilitator and coordinator. There will be 5-6 formal lectures in the Fall term. There will be no midterm or final exam for this course. You must select a project supervisor, and obtain their written consent for supervision, prior to registration in the course. You must also discuss the research component of the course, and the alternative that will be provided if the University is closed to students in the Winter term.

Course Format: The process of supervisor selection remains the same with the caveat that the supervisor is a member of the Faculty of Science. For the 2020-2021 academic year, the course format has been altered to include a remote-learning component in the Fall term led by course facilitator Dr. Aleeza Gerstein in consultation with the selected project supervisor, and a research-based component (either an in-lab, an *in silico* project or an in-depth writing project) in the Winter term led by the project supervisor. The course coordinator Dr. Ann Karen Brassinga will oversee grading and other administrative matters. ***Important note: the project supervisor must clearly define the format of the Winter term component to the student prior to the start of the Fall semester.***

Meeting times 1) Fall term: class meetings will be conducted through Zoom videoconference platform at times to be determined. See the Fall term syllabus for further details; 2) Winter term: if circumstances permit, laboratory research will be conducted during the winter term. If campus is closed to students for the winter term, an *in-silico* project or an in-depth writing project will be carried out under the guidance of the project supervisor. Class meetings may occur in person or online, as appropriate.

Course policies:

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: Screen shot capture and/or video recording of remote learning material presented by the instructor is strictly for ***personal use only*** (i.e. copyrights). ***Posting of images that include lecture material and/or instructor and/or classmates on the internet is strictly prohibited.***

Copyrighted Materials: Copyrighted content will be used 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/.

Academic Integrity: The work done in this course is highly individual. Each student must hand in his or her own copy of each assignment/project and conduct the work independently unless otherwise specified. 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 course (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. The Faculty of Science web page has detailed information (https://www.sci.umanitoba.ca/students/undergraduate-students/academic-resources/academic-integrity-2/) along with a video message (https://youtu.be/Ok-lilm4SeE). Please read/watch and follow these guidelines, and ask if you have any questions.

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Fall term 2020 (50% of final course grade)

The majority of work will be conducted by students independently outside of class time, with input from the course facilitator Dr. Aleeza Gerstein and their project supervisor. The Fall term will focus on the acquisition of oral and written research communication skills. In particular, students will learn techniques for finding good references; reading, evaluating and presenting scientific papers; drafting and editing a manuscript introduction; conducting peer review (as part of the evaluation); and visualizing data. These skills are broadly transferable to a research career. Synchronous instruction will be given periodically throughout the semester (as indicated below), but the primarily focus will be self-directed work conducted independently by the students. The evaluation format of the Fall term will be as follows:

10% - Journal club presentation of a scientific article relating to research area of selected project supervisor
5% - Introduction section of a topic relating to research area of selected project supervisor (draft)
10% - Peer review of introduction section (draft)
20% - Introduction section of research topic (final draft)
5% - Data visualization assignment

Students will require a computer that is at minimum capable of word processing and can connect by proxy server to the University of Manitoba library to access electronic resources. See here to set this up: https://libguides.lib.umanitoba.ca/c.php?g=298315&p=1988584. There is no required text. The following book (available through the library) is an excellent resource for scientific communication: The Scientist's Guide to Writing: How to Write More Easily and Effectively throughout Your Scientific Career, Stephen Heard (2016)

Tentative Schedule

Week 1	September 9-11
No class	
Outside class (with project supervisor)	Discussion of research topic
Week 2	September 14-18
In class	Introduction to the class, discussion of scheduling
	Strategies for finding and reading scientific papers
Outside class (with project supervisor)	Discussion of research topic
Week 3	September 21-25
In class	How to present a journal club
Outside class	Begin building a reference list
Outside class (with project supervisor)	Pick a paper for a journal club discussion
Weeks 4-8	September 28-October 30
In class	How to tell a scientific story
	How to write an Introduction section
Outside class	Work on Introduction
Assignment	Present a journal club
Week 9	November 1-6
In class	How to provide feedback
Assignment	First draft of Introduction section due
Week 10	November 9-13
Reading Week	
Week 11	November 16-20
In class	Data visualization techniques
Assignment	Peer review of assigned Introduction sections due
Week 12-13	November 23 – December 4
Outside class	Edit Introduction section
Assignment	Data visualization due
Week 14	December 7-11
Assignment	Introduction section due

Winter term 2021 (50% of final course grade)

The undertaking of a research project will introduce the student to real research, and thus the student must be self-motivated and disciplined to achieve the project goals outlined by the supervisor within a reasonable time frame. The onus is on the student to discuss with the supervisor about the nature of the research project and the expectations for the completion of the project. The format of the Winter 2021 term component is dependent on the lifting of COVID-19 imposed restrictions: Plan A - if lifted, then an in-lab research project will be pursued; Plan B - if not lifted, then an *in silico* or in-depth writing project will be pursued. The results from either plan will be compiled in a thesis report in the form of a manuscript that should include components of the introduction section written as part of the Fall 2020 term component of the course. The evaluation format of the Winter component will be as follows:

40% - Lab performance
10% - Thesis report in style of the *Canadian Journal of Microbiology* "Note" format

Specific details regarding the undertaking of either plan are outlined below:

i) Plan A

The student will conduct an in-lab research project as assigned by the project supervisor. The student is required to complete WHMIS/Biosafety/Autoclave training. Faculty of Science safety advisor Betty Lerner (Betty.Lerner@umanitoba.ca) will hold WHMIS/Biosafety training sessions of which the date and time will be arranged by the course coordinator. If you have not been previously certified by Ms. Lerner, you must attend one of the sessions to be certified. For those who need to use autoclaves in the Buller building, Jacylyn Villaneuva (Jacylyn.Villanueva@umanitoba.ca) will hold autoclaving training sessions of which the date and time will be arranged by the course coordinator, prior to first independent use. Peer instruction in lieu of training provided by Ms. Villaneuva is prohibited. ***You must be certified by Ms. Lerner and Ms. Villaneuva (if applicable) prior to starting lab work. In addition, for safety reasons, project students cannot work alone in research laboratories thus must be supervised accordingly by the project supervisor, or by personnel (a technician, a postdoctoral research fellow or a graduate student) assigned by the project supervisor.***

ii) Plan B

The student will conduct an *in silico* research project or in-depth writing project as assigned by the supervisor.
The student must have access to a computer with sufficient memory and storage specifications to conduct the project.

Final Evaluation of Course Grade:

The Fall term component will be evaluated by course facilitator Dr. Aleeza Gerstein that includes journal club presentation performance, and the final draft of the written introduction section in consultation with the student's project supervisor, if appropriate. For the Winter term component, the research project performance will be evaluated by the project supervisor, and the thesis report will be evaluated by two readers; the course coordinator and a faculty member other than the project supervisor.

The thesis report will be in the form of a scientific-style manuscript written in the style of *Canadian Journal of Microbiology* "Note" format (please see link for details https://www.nrcresearchpress.com/page/cjm/authors#type). The written report in completion, or sections thereof, can be reviewed only ONCE by the student's supervisor (without evaluation) for suggestions/corrections prior to submission. Ensure that the supervisor has a minimum of a week to review the written report. Three paper copies must be handed in to the course coordinator no later than 5 pm CDT on Friday April 16, 2021. If paper copy submission is not possible due to COVID-19 related restrictions, then PDF files will be accepted. Late paper copy submissions will be deducted 2% per day starting Monday April 19, 2021 to a maximum of 10%. Late emailed PDF submissions will be deducted 2% per day starting Saturday April 17, 2021, if appropriate.

Final letter grades will be determined by the summation of the Fall and Winter term evaluation scores as evaluated by the course facilitator, course coordinator, and the project supervisor. In general, the number and type of letter grades will determine the final letter grade. 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.

In the event that the student is unable to complete the work of any or all course components due to unforeseen circumstances (illness, family emergency, etc.), then the student must contact the course coordinator who, in consultation with the project supervisor, Department Head and Faculty of Science, will decide on alternative arrangements.