

MBIO 3000: Applied Biological Safety
University of Manitoba, Department of Microbiology
Interdisciplinary Undergraduate Course, 3 Credits

Dr. Steven Theriault, E.M.C.A, HBS, MSc, PhD (Medical Microbiology)
Cytophage Technologies, Inc.
Contact email: mbio3000@cytophage.com

Applied Biological Safety Course

This course is designed to meet the needs of Microbiology undergraduate students for a comprehensive overview in the historical, theoretical, and practical aspects of applied biological safety in research and industrial environments. The course consists of lectures, examinations and an assignment.

The lecture component of this course will include topics in:

- Principles of containment laboratories
- Select agents
- History of infectious disease
- Diagnostic evaluation of infectious disease
- Applied biosafety research principles
- Containing infectious disease outbreaks
- Vaccine overview and safety
- Special Topics in biosafety
- History of Agro/bioterrorism

Course Components

Classes will consist of lectures and hands-on work (dependant on class size) or demonstrations using biological safety equipment. Each participant will be part of either a group or individual project on either practical or theoretical aspects of applied biosafety principles; or an assignment covering theoretical aspects of applied biosafety principles.

Course Flow for 2022

As the COVID pandemic continues, there will be some changes to the course for this year.

1. Class will be held at the normal class times via Zoom with recordings posted on UM Learn for reviewing.
2. Evaluations will include a timed midterm exam worth 25% of your final grade to be completed on UMLearn (date TBD) and an assignment worth 25% of your final grade.
3. The contact email address for this course is: mbio3000@cytophage.com (responses are usually within 24 hours)
4. The final exam is worth 50% of your grade. Due to COVID-19, the exam format will be discussed closer to the end of term.

Proposed Objectives

1. To provide a comprehensive overview of select agents, infectious diseases, applied biosafety research, and containment laboratory issues.
2. To understand the underlying causes of laboratory acquired infections, the need for a safety program and the administrative, engineering controls and personal protective equipment measures available to maintain biological safety.
3. To provide a strong understanding of current and new technologies and procedures used for decontamination in the laboratory environment.
4. To provide the students with the opportunity to learn about alternative career choices in the area of health and safety.

Course breakdown

Date

Midterm.....	25%	TBD
Assignment.....	25%	TBD
Final exam.....	50%	TBD by Registrar's Office

Assignment

The details of the assignment will be discussed in class. All assignments are to be submitted electronically through UMLearn. The UMLearn submission dropbox will automatically close after the due date and time. Any late submissions must be received at mbio3000@cytophage.com in order to be graded. All late submissions will be deducted 5% per day from your final grade. For example, if you submit one day late, you can only receive a maximum of 20/25 on your assignment, or 95% for your final grade. Two days late, you can only receive a maximum of 15/25 on your assignment. If you are unsure of how your computer performs during the upload process, please allow yourself extra time to avoid late penalties.

Telegram and/or What's App and/or Group Chats

Please be aware of the University of Manitoba policies regarding group chats on University sanctioned and non-University sanctioned platforms. It is strongly recommended if these groups are formed for MBIO 3000, that the instructor(s) and/or TA be a part of the discussions to avoid misinformation regarding course material and exam administration and to maintain respectful and appropriate discourse. All chats must be disabled during examination periods. Evidence of academic dishonesty revealed through group chats will be investigated as per University of Manitoba Student Academic Misconduct policies and appropriate disciplinary action will be taken. If you are aware of academic dishonesty revealed through group chats, it is strongly recommended that you report it, otherwise you may be considered implicit!

SAS

Course instructors are willing to meet with students to discuss the accommodations recommended by Student Accessibility Services, but extended exam times can only be provided with approval from SAS. If SAS accommodations are required, they must be registered at minimum of two weeks before the examination period, or assignment due date. If notification

is not received at mbio3000@cytophage.com two weeks prior to examination date or assignment due date, accommodations will not be provided, and grades will be assigned accordingly. If you are unsure if SAS has contacted the instructor(s), it is **your** responsibility to make sure that the information has been received at mbio3000@cytophage.com two weeks prior to evaluation due date.

Letter Grades

Letter grades will be assigned by 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>. The goal is to provide grades that represent performance in the context of the class; the grades will not be curved to meet an expected distribution, but conversion of percentages to letter grades will be at the discretion of the instructor.

For this course, **a grade of 45% on the final exam is required to pass the class**. The grading scheme generally, but not always, will be close to the following: A+ (>90%), A (80-89.9%), B+ (75-79.9%), B (70-74.9%), C+ (65-69.9%), C (60.0-64.9%), D (50- 59.9%), F (<50% total, or <45% in final exam). Note that in some courses, an A+ is received only for numerical grades >93% (Nursing, Asper) so there is precedent for shifting grade boundaries higher than those listed above.

Exam Appeal

If you do not agree with the evaluation of your midterm exam, you may request it be appealed, in writing, to mbio3000@cytophage.com, up to **seven days** following the release of your initial grade. Any requests made after this time will not be honored. All appeals will result in your entire exam being re-graded. This may result in a lower grade than initially received! If you wish to appeal your final exam, please refer to the University of Manitoba official exam appeal policy and process: <https://umanitoba.ca/registrar/grades/appeal-grade>

Deferred Exams

There is no deferred midterm exam. If you miss the midterm exam for medical or compassionate reasons, the marks will automatically be added to the final exam which will be worth 75% of your final grade. **Medical or compassionate notes must be sent to mbio3000@cytophage.com to receive this deferral, otherwise you will receive a grade of 0 on your midterm.** The final examination will be comprehensive (i.e., cover all lectures), and will be scheduled by Student Records during the April examination period. Permission to write a deferred final exam is granted by your Faculty - the instructor is not involved in this process. If it is necessary for you to write your final exam at an alternate date, you must contact your Faculty office with appropriate documentation to request permission for a deferred exam. This is a **strict** university policy, and there are no exceptions. If a deferral is granted it is your responsibility to contact the instructor as soon as possible for the date of the deferred exam.

Academic Integrity and Dishonesty

Guidelines are stated in your calendar regarding University policy with respect to academic dishonesty (particularly plagiarism, impersonation and cheating), as well as behaviour and absence from final exams. All exams are to be written individually, without any discussion in person or electronically. Acceptable resources (notes, research papers) will be noted in class prior to the exam. If it isn't on the list, you cannot use it! In cases of cheating or collaboration during examinations, the test(s) in question will be given a grade of 0% and the student will be reported to the appropriate authorities for disciplinary action. Dishonesty during final exams will be reported directly to the Faculty of Science.

The Faculty of Science web page has detailed information, with which you must become familiar. Please read and follow these guidelines and ask if you have any questions.

(<https://sci.umanitoba.ca/students/undergraduate-students/academicintegrity-2>)

Watch the Faculty of Science video outlining issues regarding academic integrity in the context of on-line examinations, and the consequences of cheating: (7 min)

<https://youtu.be/Ok-lilm4SeE>

Textbooks

There are no prescribed textbooks for this course, but basic information can be found in the following reference materials.

1. Collins CH, Kennedy DA. Laboratory-acquired Infections: History, incidence, causes and preventions. 4th ed. Butterworth-Heinemann, Oxford, 1999
2. Wooley and Byers. Biological Safety, Principles and Practices. 6th ed. ASM Press, Washington, D.C., 2017
3. Richmond JY. Anthology of Biosafety: volumes 1-10

Further information may be found in the following:

1. Laboratory Biosafety Manual, World Health Organization, 4nd ed., Geneva, 2020
<https://www.who.int/publications/i/item/9789240011311>
2. Biosafety in Microbiological and Biomedical Laboratories, Centers for Disease Control and Prevention/National Institutes of Health, 6th ed., <https://www.cdc.gov/labs/BMBL.html>
3. Laboratory Biosafety Guidelines, Health Canada, 2019
<https://www.canada.ca/en/public-health/services/canadian-biosafety-standards-guidelines.html>

Students - UM COVID-19 - Syllabus Insert – January 19, 2022.

The University of Manitoba (the “UM”) is committed to maintaining a safe learning environment for all students, faculty, and staff. Should campus operations change because of health concerns related to the COVID-19 pandemic or other campus-wide emergency, it is possible that this course will move to a fully remote delivery format. Should the instructor be required to stay at home for an extended period and an alternate instructor not be available, the course may move temporarily to a remote delivery format. In that instance, you may be provided with an asynchronous option to minimize the impact the change may have on your schedule.

PPE and Mask Wearing

In a face-to-face environment, our commitment to safety requires students to observe all physical distancing (2m) and personal protective equipment (PPE) guidelines set by the University (<https://umanitoba.ca/coronavirus>)

While on campus and in class, you must wear PPE (Personal Protective Equipment) as stipulated in current [University policies, procedures, and guidelines](#). Students who fail to comply are subject to disciplinary action in accordance with the [Student Discipline Bylaw](#) and the [Non-Academic Misconduct and Concerning Behaviour Procedure](#).

Medical-grade 3-ply masks are available at many locations on campus, including specific classroom locations, designated by your unit, the Elizabeth Dafoe Library (Fort Garry Campus) and the Brodie Centre main doors (Bannatyne Campus). Additional PPE, if necessary for a specific learning environment, will be provided to you by the teaching unit.

If you do not follow masking and other requirements you will be asked to leave the learning space and may only return to the class already in progress when you have complied with these requirements. Repeated issues will result in disciplinary action as previously noted.

Students should not eat or drink during class time.

Illness

Remember: **STAY HOME IF YOU HAVE SYMPTOMS OR ARE ILL.** If you become sick or are required to self-isolate you should notify your instructor by email so you can develop a plan to complete the course learning outcomes while you are absent.

If you have symptoms, do not come to campus or any UM facilities. Complete the [self-assessment](#) on the Manitoba Public Health site and follow the guidelines, which may include booking a COVID-19 test.

What to do if you become ill while at UM:

1. Leave the classroom, lab or workspace immediately. Continue to wear your mask while leaving the premises and/or while waiting for transportation.

2. Perform hand hygiene (soap and water or hand sanitizer) and avoid contact with others, and minimize contact with the physical environment.
3. Once at home, complete the [MB self-assessment](#) and follow the directions that are provided.
4. Inform your supervisor(s), instructor(s) or, if in residence, the appropriate individual.
5. You must remain off campus and all UM facilities until cleared to return in accordance with self-assessment, testing results, or MB Health requirements.

Recommended transportation options (in order):

1. Drive yourself home.
2. Pick-up by family or friend – remember to keep your mask on and to distance as much as possible, and where possible, open a window to improve ventilation.
3. Pickup by taxi/Uber:
 - Remain masked and perform hand hygiene before entering the vehicle.
 - Avoid touching the inside of the vehicle
 - Keep your mask on for the duration of the ride
 - Where possible, open a window to improve ventilation.
4. Winnipeg Transit buses - Winnipeg Transit has indicated that individuals that are ill **must not use Transit**.