

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

Contact:

Steven Theriault E.M.C.A, HBSc, MSc, PhD.
CYTOPHAGE TECHNOLOGIES
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.

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
- Research principles for Biosafety
- Containing infectious disease outbreaks
- Biological safety principles
- History of Argo/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 a group project on either practical or theoretical aspects of applied biosafety principles; or an assignment covering theoretical aspects of applied biosafety principles.

Course Flow for 2021:

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

- Class will be held at the normal class times via Zoom with recordings posted on UM Learn for reviewing.
- Evaluations for this course will still use written exams, times for the exam will be discussed in class
- I can be reached at the above email for questions or comments. I try to reply to emails within 24 hours.

Final exam for 2021:

The final exam, worth 50% of the grade. Due to COVID the exam format will be discussed closer to the end of the 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 better 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%	March 2, 2021
Assignment.....25%	March 30, 2021
Final exam.....50%	TBD by Registrar’s Office

Assignment

The details of the assignment will be discussed in class.

Zoom

For synchronous activities (some lectures, in-class assignments) your zoom username must include your first and last names so you can be identified as a member of the class if necessary. All interactions on zoom must be respectful to all and reflect behaviours you would use in a work or classroom setting.

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.

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 of >93% (Nursing, Asper) so there is precedent for shifting grade boundaries higher than those listed above.

There are no deferred in-class tests. If you miss a test, the marks automatically will be added to the final exam. Medical or other notes are not required. 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 visit 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 in-class 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.

<https://sci.umanitoba.ca/students/undergraduate-students/academic-resources/academic-integrity-2>

Please read and follow these guidelines and ask if you have any questions.

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>

Further information may be found in the following:

1. Laboratory Biosafety Manual, World Health Organization, 4th 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>
<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>

~~4. Containment Standards for Veterinary Facilities, Agriculture and Agri-Food Canada, 1996~~ Replaced by above

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