

BIOC17H3

Microbiology: The Bacterial Cell

-2018-



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Course description

- **Learning objective of this course:** This course provides students with basic background in general microbiology. The course is focused on bacteria and introduces eukaryotic microbes, archaea and viruses. Topics presented include: history and relevance of microbiology, origin of life and evolution of microbes, microbial classification and phylogeny, cellular structure, function and replication, and microorganisms in health and disease.
- **BIOC17H3 is a lecture course with a laboratory component.** Some material in the laboratory will address practical concepts that are best presented in a lab setting, and will not be addressed in detail in lectures. However, much of the lab and lecture concepts are interrelated. During lectures, I will highlight material related to the laboratory.
- **In the BIOC17H3 laboratory,** you will be acquiring skills that are useful in the job market such as culturing and identifying bacteria. These are valuable techniques for jobs requiring a microbiology background, like for clinical and environmental sampling, in the food industry, biopharmaceuticals, cosmetic industry, government testing labs, blood services labs.

Office hours and communication lines

-General announcements and any material needed for the course will be posted on **blackboard**

-**Office hours: Wednesday 2:30 to 3:30 and Friday 11 to 12 pm** in Professor Terebiznik's office, 5th floor, Room 535, Science Wing. You can also request appointments by email terebiznik@utsc.utoronto.ca

-**e-mails:** You can ask questions by email, but I would prefer to meet you in person. Please only use email for questions with straightforward answers. Questions that require detailed answers will be addressed during office hours. Please use a U of T account for email (I will not answer emails from other email accounts), and please indicate the course (BIOC17 and name of your TA) in the subject heading

-Lectures:

Fridays 9:00 to 11:00
Location Room SY 110

Important: The attendance to lectures is not mandatory but highly recommended to succeed in the course. Lectures are not exclusively based on the textbook. The material presented in lectures has been gathered from multiple sources, including reviews and primary sources.

Slides outlines will be uploaded on blackboard one day before the lecture.
You will need to take lecture notes to study for the exams.

What do you need to know for lecture exams:

Your lecture notes, slides and suggested readings are your most important guide to what you need to know. The lecture exam questions will be taken from the material covered and in any way discussed in class. I emphasize certain material in lecture. It is important you come to lecture to get a feel for which information is highlighted. (All material in each slide is not equally relevant). I also expect you to supplement the lecture notes with the additional detail I provide in lecture.

Video recording Lectures: “Recording or photographing any aspect of a university course - lecture, tutorial, seminar, lab, studio, practice session, field trip etc. – without prior approval of all involved and with written approval from the instructor is not permitted.” For further information on University policies, please refer to the following links for details <http://teaching.utoronto.ca/teaching-support/course-design/developing-a-syllabus>.

-Laboratory:

The attendance to practicals is mandatory. You need a medical certificate to excuse missed labs. You must read the laboratory outline for more information

-Text books:

-Lectures:

The Pearson custom Library for the Biological Sciences- BIOC17 Microbiology- ed 2017
Available in bookstore.

This book was compiled by Professor S Brunt. It combines two different textbooks (Brock: Biology of Microorganisms and Bauman: Microbiology with diseases by body system) reducing the cost of the text book. This book can also serve as a resource for BIOD26 and BIOD17. A copy is on reserve in the library. **Note: Midterms and final exams are based on material presented in lectures. While I take material from multiple sources, this text book most closely reflects the material and the level of coverage for this course.**

- Laboratory:

Microbiology: Laboratory Theory and Application by M. Leboffe and B. Pierce. Course costumed edition. Morton Publishing Company third edition
You will need a copy of the lab manual, either used or new.

-Websites:

PubMed: Search function to get recent research papers on virtually any Biology topic and to search free textbooks. www.ncbi.nlm.nih.gov

Online text book of Microbiology: <http://www.textbookofbacteriology.net>

Canadian Society of Microbiologists: <http://www.csm-scm.org>

American Society for Microbiology: <https://www.asm.org>

- Exams and grading :

Several **different types of evaluations** are used in the calculation of your grade in this course. These include: two lecture exams (Midterm and Final: multiple choice format), one final lab exam (short answer/ short essay format) given in the final exam period with the lecture exam, lab practicals (e.g. slides to be handed in and graded), lab reports as well as lab preparation and performance based on in- class exercises and lecture participation through one-minute writes/case studies.

To succeed in the course:

1. Come to class and attend laboratories (which are required see laboratory outline)
2. Ask questions in class, in the lab, and in office hours
3. Go over your lecture and lab notes as soon as possible after each class
4. Set up a study group with one or two other students in the class (e.g. your lab partners), with whom to discuss these. Studies have shown that the sooner you review your notes, the longer you retain the information ("positive reinforcement")

Mark breakdown:

Midterm exam: 24% of the final grade. The midterm exam covers material from the lectures delivered before the reading week. It doesn't include a laboratory component. The exam consists of around 70 multiple choice questions, with 5 possible answers. Duration 2 hours

-Final exam: Consist of a laboratory and a lecture component.

The lecture component (35% of the final grade) covers material from midterm onwards. Thus, it is **not cumulative** and consists of around 70 multiple choice questions with 5 possible answers. The questions are based on the lectures and assigned readings that were not included in the midterm exam.

-The laboratory component of the final exam contributes to 15% of the final grade. For the grade distribution for the laboratory, including **lab reports and participation**, please see the **Laboratory outline**.

Participation in class during lectures and lab practicals will be considered for your final grade.

Missing exams:

You must contact me within 48 hours of missing the midterm and obtain a UTSC medical certificate filled in by your doctor to be able to write a makeup midterm exam

<http://www.utoronto.ca/ctl/sites/utoronto.ca.ctl/files/resource-files/Verification-of-Illness-or-Injury-form-Jan-22-2013.pdf>

Lectures outline:

The following outline is tentative and the order of subjects and topics listed could change as the course develops. You must consult UTSC 2017-2018 calendar for important sessional dates and related information. Link:

<http://hive.utoronto.ca/public/registrarCalendar%20Sessional%20Dates%20for%20RO1%20website.pdf>

	TOPIC
Lecture 1	Course outline Introduction to the microbial world
Lecture 2	From the discovery of microbes to the golden age of Microbiology. Germs Theory of Diseases
Lecture 3	Microbial origin and evolution. Microbial identification and phylogeny
Lecture 4	Microbial diversity and metabolism
Lecture 5	Bacterial cell: Cell wall and membranes: Composition, biochemistry and function.
Lecture 6	Capsules and Biofilms Attachment and motility
Lecture 7	Bacterial motility, mechanism structure and function. Chemotaxis in bacteria. Quorum Sensing
Lecture 8	Bacterial secretion systems, function and relevance
Lecture 9	Bacterial cell cycle, cytoskeleton and chromosomal replication
Lecture 10	Extrachromosomal elements. Horizontal gene transfer, mechanism and relevance.
Lecture 11	Bacteria in health and disease. Commensal and pathogenic flora. Immune recognition of bacteria.
Lecture 12	Virus, general characteristics, structure, taxonomy and pathogenesis

We will also have guest lectures by scientist in academia, public health and industry to illustrate different aspects of microbiology- The material presented in these lectures will be covered in the exams.

IMPORTANT INFORMATION !!!

Accessibility (source http://www.utsc.utoronto.ca/~ability/faculty_syllabus.html):

Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability/health consideration that may require accommodations, please feel free to approach me and/or the *AccessAbility* Services Office as soon as possible. I will work with you and *AccessAbility* Services to ensure you can achieve your learning goals in this course. Enquiries are confidential. The UTSC *AccessAbility* Services staff (located in S302) are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations (416) 287-7560 or ability@utsc.utoronto.ca.

Academic integrity/plagiarism (from CTL)

Academic integrity is essential to the pursuit of learning and scholarship in a university, and to ensuring that a degree from the University of Toronto is a strong signal of each student's individual academic achievement. As a result, the University treats cases of cheating and plagiarism very seriously. The University of Toronto's Code of Behaviour and information of Academic integrity can be found at :

<http://academicintegrity.utoronto.ca/> (<http://www.governingcouncil.utoronto.ca/policies/behaveac.htm>) outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences. Potential offences include, but are not limited to:

(source http://www.utsc.utoronto.ca/~vpdean/academic_integrity.html)

In papers and assignments:

- Using someone else's ideas or words without appropriate acknowledgement.
- Submitting your own work in more than one course without the permission of the instructor.
- Making up sources or facts.
- Obtaining or providing unauthorized assistance on any assignment.

On tests and exams:

- Using or possessing unauthorized aids
- Looking at someone else's answers during an exam or test.
- Misrepresenting your identity.

In academic work:

- Falsifying institutional documents or grades.
- Falsifying or altering any documentation required by the University, including (but not limited to) doctor's notes.

The formal lab report and optional assignment will be submitted to turnitin

"Normally, students will be required to submit their course essays to Turnitin.com for a review of textual similarity and detection of possible plagiarism. In doing so, students will allow their essays to be included as source documents in the Turnitin.com reference database, where they will be used solely for the purpose of detecting plagiarism. The terms that apply to the University's use of the Turnitin.com service are described on the Turnitin.com web site".

If you wish to opt out of turnitin, you must do it in writing to the Professor and Lab Coordinator, and provide an electronic copy of your lab report as well as copies of all rough work and referenced material.