

BIOL 2905.03 – Medical Microbiology F2015 Course Outline

Calendar description:

Fundamentals of microbiology; microbial organisms; microbe-host interactions; microbial genetics and evolution; microorganisms and human disease; environmental and applied microbiology – all with a focus on Medical applications and associated interaction with the Human Immune system. Three lecture hours. One term. Three credits. Prerequisites: SC/BIOL 1010 or SC/BIOL1000/1001 OR EQUIVALENT

Degree Credit Exclusion: SC/BIOL2900 or SC/BIOL 3150.04.

Learning objectives:

Upon successful completion of BIOL2905, students will be able to:

- explain major concepts, methodologies and issues in microbiology, demonstrating detailed knowledge in certain topics (i.e. listed course topics).
- gather, review, evaluate and interpret microbiology information (in reviews, primary sources and mass media articles).
- **apply learning from other areas (e.g. biochemistry, genetics) to microbiological problems/situations.**
- solve basic microbiological problems.
- analyze microbiological situations/techniques.
- Predict the outcome of microbiological tests and symptoms.
- identify problems and suggest possible solutions in terms of microbiology and society.
- communicate (orally and in writing) microbiological concepts clearly to peers and a scientific audience.
- Understand microbiological laboratory activities with safety, reliability and a good understanding of aseptic technique.
- discuss and debate current issues relating to microbiology.
- effectively and collegially work with others in the microbiology class setting.

Course director and habitat:

Dr. Michael Gadsden, Room 3042 Stephen Quinlan Bldg (Seneca@York).

Email: mgadsden@yorku.ca Phone: 416-491-5050 ext 33247

Class: Lecture = Wednesdays 2:30 - 5:20 pm in LAS A

Website: The BIOL 3150 Moodle site will include announcements, course materials, resources and a discussion forum. <http://moodle.yorku.ca> or <https://moodle08.yorku.ca/moodle/>

Text/Readings: Microbiology Fundamentals: A Clinical Approach by M.K. Cowan and J. Bunn, 1st Edition. (2nd Edition may be available at the beginning of semester. If so get that book)

Additional readings (e.g. review and primary research articles) will be assigned during the course. **Articles** will be available via the instructor or the York libraries. Students are expected to read relevant sections of the text and readings prior to class. Some assignments will also require additional research and reading of scientific literature.

Evaluation:

Midterm 1: 20% **Oct 14th – First hour of class.**

Midterm 2: 20% **Nov 11th – First Hour of class**

Assignment(s): 20% (will include components. Due dates will be announced in class)

Moodle Quizzes: 5%

Final exam: 35%

** Tests include Multiple Choice and Short answer.

Details regarding the midterm/exam format, project components and mini-assignments and activities will be provided in class.

Accommodation Statement:

Students who feel that there are extenuating circumstances that may interfere with their ability to successfully complete the course requirements are encouraged to discuss the matter with the Course Director as soon as possible.

Students with physical, learning or psychiatric disabilities who require reasonable accommodations in teaching style or evaluation methods are encouraged to consult with the Office for Persons with Disabilities (OPD) and ensure that requests for appropriate accommodations are arranged with the Course Director early in the term.

Academic integrity:

Students are expected to be familiar with and follow York University's policies regarding academic integrity. Please consult the lab manual and website below for more details:

<http://www.yorku.ca/academicintegrity/students/index.htm>

Student information sheet – please see:

<http://www.yorku.ca/secretariat/senate/committees/ccas/documents/Course%20Outline%20-%20Student%20%20Info%20Sheet%20-%20March%2027-06.htm>

Planned course topics: May be changed by Course Director

In the context of particular issues/cases/problems, we will explore key aspects of:

- History of microbiology and Biology Background
- Microbe Characteristics
- Cell structure/function of Eukaryotes, Bacteria, and Archaea
- Bacterial growth
- Environmental factors affecting growth of bacteria and archaea
- Evolution/systematics/taxonomy of bacteria and archaea
- Genetics/genomics of bacteria
- Bacterial regulation/signal transduction (e.g. chemotaxis, quorum sensing)
- Control of bacterial growth
- Human-microbe interactions
- Epidemiology
- Applied microbiology
- Social impact of microbiology

➤ **All the above will be taught in context with Pathogenicity and various therapies**

Policies:

1. If you miss a test or exam with a legitimate documented reason, you must bring in acceptable documentation PROMPTLY (**within 1 week**)! **Only a 2014 version of the "York Attending Physician's Statement Form"** (can be downloaded as part of the Petitions Package) OR *a similarly detailed* doctor's note (i.e. not a form stating that the student visited a clinic) will be accepted for medical excuses. All documentation supporting your excuse for missing a test must be received by me **within 1 week** of the missed test. **YOU MUST ALSO CONTACT ME ON THE DAY OF THE TEST/EXAM NOTIFYING ME THAT YOU WILL NOT BE ATTENDING – JUST AS YOU WOULD AT A JOB.** Your final exam mark will be used for the missed test grade. If the final is missed, you must write a deferred exam (if granted) as scheduled by the department. Late assignments will be assessed a 10% penalty (of the total grade value) a day for a maximum of 5 days late (including weekends). After that it will not be accepted. **If an extension** has already been granted then late assignments **will not** be accepted after the extended due date.
2. The tests and final exam will include written questions. If you believe that an answer on a test was marked incorrectly, you must submit your (written) rationale and paper for remarking within 1 week of the test being made available to you (if you completed your test in ink). **Note: Remarking can result in the mark being raised, confirmed or lowered.**
3. In order to be fair and consistent with regards to the entire class, individual grades are not negotiable. **Contact me about marks ONLY if there is a clear error in your mark** (calculation, clerical, etc.) as soon as possible. It is highly unlikely that you will receive a response regarding any other mark-related queries.
4. Students who do not write the final exam, but have completed all midterms, and project assignments by the scheduled dates, must contact me for permission to write a deferred exam (i.e. sign the Deferred Standing Agreement form). It is Senate Policy that "*Normal requests for deferred standing must be **communicated within one week following a missed examination, or on the last day to submit course work whichever comes first***". Please check out the Registrar's Office Deferred Standing FAQs: (http://www.registrar.yorku.ca/services/ds_faq.htm) for more details.

Students who have missed one or more of the midterms (or other major components) will likely be required to petition to write a deferred exam. Students who miss both test and the scheduled exam CANNOT pass the course since their evaluation cannot be directly comparable to their peers with respect to a timely examination of the material.

Some information about BIOL2950 (Microbiology) from the course director.

The big questions driving this course are:

- What do you need to know about microbiology as an upper-year prospective Nursing student?
- What do you need to know about microbiology as an informed citizen?

→ Some notes about this course:

- You'll learn about key issues and concepts in microbiology by dealing with *real world*, current issues/examples.
- The textbook is a good resource to help you learn, but you will need to delve into additional reference sources. (We *won't be* marching linearly through the textbook, by the way. You'll need to use the index and table of contents.)
- Class time should be focused on interesting/complicated/problematic topics, rather than material that is easy to learn (e.g. from reading the text).
- *To deal with complex issues, you will need to be able to apply and integrate information, and use problem-solving skills.*

- I'll happily share the resources I've got, but you'll need to seek, read and understand those resources.
- Please ask me for guidance – I'm here to help you learn. I'll try to highlight what I think students might have trouble with anyhow, but you can (and should) direct me to concepts you find problematic so that we can explore them in class.
- If/when you encounter problematic concepts – you can:
 - talk to your fellow students (After class, in Moodle, in study groups)
 - seek and read additional reference sources
 - Ask questions of me in class
 - give input in Moodle quizzes/surveys

What will we do in class?

Specific examples or issues will be reviewed/discussed in class in the context of real-world problems, news stories, issues and/or recent research reports. Class time will provide an opportunity to discuss and explore aspects of topics that might be more difficult to learn on your own. Thus, it will be most effective if you have read the appropriate portions of the textbook and other recommended references prior to class. Confusing or problematic aspects can be brought up ahead of time or in class. (Mini-assignments/activities may be based on these topics, or others.) We may also have some guest experts in some classes.

A few example topics are listed below, with the themes that will be used in understanding and discussing the particular item/issue. **We will look at additional topics, and even the example topics are subject to change.**

Bugs in the news – what are those crazy “germs” up to now?

- Microbiology in the news

Antibiotic resistance – Superbugs (e.g. Vancomycin resistance)

- Cell structure/function
- Evolution
- Genetics
- Control of microbial growth
- Epidemiology
- Microbiology in the news
- Social impact

Cell Structure and Lifestyle

- Cell structure/function
- Growth/environmental factors
- Themes in microbiology
- Humans and pathogenic bacteria (e.g. *S. aureus*)
- Regulation (chemotaxis, quorum sensing)
- Human-microbe interactions including knowledge of the Human immune system and reactivity to invading pathogens from all three Domains.