

Department of Biology Course Outline

Introduction to Medical Microbiology BIOL2905 Winter 2016

Course 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

Prerequisites: SC/BIOL 1010 or SC/BIOL1000/1001 OR EQUIVALENT
Degree Credit Exclusion: SC/BIOL2900 or SC/BIOL 3150.04.

Course Instructors and Contact Information

Course Director: Dr. Mike Gadsden
Habitat: Room 3042 Stephen Quinlan building (Seneca@York)
Email: mgadsden@yorku.ca
Phone: 416-491-5050 ext 33247

Office appointments by request. Please use email or phone for an appointment

Schedule

One three hour lecture;
Wednesday, 2:30 – 5:20 pm
Lecture Hall – LAS C

Evaluation

Midterm 1: 20% **Feb 3rd – First hour of class.**
Midterm 2: 20% **March 16th – 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.

Important Dates

Test Dates are listed under "Evaluation" above.

Assignment specifics and dates will be discussed in class. The assignment information will be found on the course Moodle site under "Assignments".

Classes begin the week of Jan 3rd, 2016

Last day to Drop the course: March 4th, 2016

Reading week: Feb 13 to 19, 2016

NOTE: for additional important dates such as holidays, refer to the "Important Dates" section of the Registrar's Website at <http://www.yorku.ca/yorkweb/cs.htm>

Resources

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.

Learning Outcomes

Upon successful completion of this course, students should 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.
- Understand the variety of potential employment avenues
- Connect the basic function of the Human immune system to pathogen detection
- Learn the positive impact of microbes in society and on/in Human physical and mental health

Course Content

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, various therapies, and benefit of the Human microbiota**

A more detailed Outline can be found on the course Moodle website.

Experiential Education and E-Learning

Students will be expected to search resources in Literature and on the internet to comment/discuss the latest microbiological trends in Healthcare. A guest speaker currently working in Healthcare may address the class to relate real life experience.

Other Information

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 all 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.

Course 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 first¹. 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.

University Policies

Academic Honesty and Integrity

York students are required to maintain the highest standards of academic honesty and they are subject to the Senate Policy on Academic Honesty (<http://secretariat-policies.info.yorku.ca/policies/academic-honesty-senate-policy-on/>). The Policy affirms the responsibility of faculty members to foster acceptable standards of academic conduct and of the student to abide by such standards.

There is also an academic integrity website with comprehensive information about academic honesty and how to find resources at York to help improve students' research and writing skills, and cope with University life. Students are expected to review the materials on the Academic Integrity website at - <http://www.yorku.ca/academicintegrity/>

Access/Disability

York University is committed to principles of respect, inclusion and equality of all persons with disabilities across campus. The University provides services for students with disabilities (including physical, medical, learning and psychiatric disabilities) needing accommodation related to teaching and evaluation methods/materials. These services are made available to students in all Faculties and programs at York University.

Students in need of these services are asked to register with disability services as early as possible to ensure that appropriate academic accommodation can be provided with advance notice. You are encouraged to schedule a time early in the term to meet with each professor to discuss your accommodation needs. Please note that registering with disabilities services and discussing your needs with your professors is necessary to avoid any impediment to receiving the necessary academic accommodations to meet your needs.

Additional information is available at the following websites:

Counselling & Disability Services - <http://cds.info.yorku.ca/>

Counselling & Disability Services at Glendon - <http://www.glendon.yorku.ca/counselling/personal.html>

York Accessibility Hub - <http://accessibilityhub.info.yorku.ca/>

Ethics Review Process

York students are subject to the York University *Policy for the Ethics Review Process for Research Involving Human Participants*. In particular, students proposing to undertake research involving human participants (e.g., interviewing the director of a company or government agency, having students complete a questionnaire, etc.) are required to submit an *Application for Ethical Approval of Research Involving Human Participants* at least one month before you plan to begin the research. If you are in doubt as to whether this requirement applies to you, contact your Course Director immediately.

Religious Observance Accommodation

York University is committed to respecting the religious beliefs and practices of all members of the community, and making accommodations for observances of special significance to adherents. Should any of the dates specified in this syllabus for an in-class test or examination pose such a conflict for you, contact the Course Director within the first three weeks of class. Similarly, should an assignment to be completed in a lab, practicum placement, workshop, etc., scheduled later in the term pose such a conflict, contact the Course director immediately. Please note that to arrange an alternative date or time for an examination scheduled in the formal examination periods (December and April/May), students must complete an Examination Accommodation Form, which can be obtained from Student Client Services, Student Services Centre or online at

http://www.registrar.yorku.ca/pdf/exam_accommodation.pdf (PDF)

Student Conduct in Academic Situations

Students and instructors are expected to maintain a professional relationship characterized by courtesy and mutual respect. Moreover, it is the responsibility of the instructor to maintain an appropriate academic atmosphere in the classroom and other academic settings, and the responsibility of the student to cooperate in that endeavour. Further, the instructor is the best person to decide, in the first instance, whether such an atmosphere is present in the class. The policy and procedures governing disruptive and/or harassing behaviour by students in academic situations is available at - <http://secretariat-policies.info.yorku.ca/policies/disruptive-andor-harassing-behaviour-in-academic-situations-senate-policy/>