

## Department of Biology Course Outline

SC/BIOL 2905 3.00 Introduction to Clinical Microbiology  
Winter 2020-21

**All components of this course are online**

There are no in-person interactions on campus.

This course is presented in Toronto time - Eastern Standard Time (EST)

### Technological Requirements

You **must have access to reliable high-speed internet connection (Wi-Fi) and a computer** in order to take this course.

Some aspects of the course will involve video conferencing software (e.g. Zoom). Exams and other assessments may be conducted with the aid of an online proctoring service (see further details below).

Video and audio capabilities are required for some aspects of this course.

In the event a virtual oral examination is required, video, audio, and screen sharing capabilities will be required. Word processing software will also be required for virtual oral examinations (e.g. Microsoft Word).

Reliable access to eClass and ability to stream videos from eClass is required.

### Course Description

Medical microbiology for students interested in nursing and other health fields. This course is an introduction to concepts of medical microbiology, human-microbe interactions, mechanisms of microbial diseases, control of microbial growth, immunology and epidemiology.

### Prerequisites (strictly enforced)

At least 30 credits towards a degree program; six credits from the following: SC/BIOL 1000 3.00, SC/BIOL 1001 3.00, SC/BIOL 1010 6.00; SC/NATS 1610 6.00, SC/NATS 1650 6.00, SC/NATS 1660 6.00, SC/NATS 1670 6.00, SC/NATS1675 6.00, SC/NATS 1680 6.00, HH/KINE 2011 3.00, HH/KINE 2031 3.00; or permission of the Instructor.

**Course credit exclusions:** SC/BIOL 2900 3.00, SC/BIOL 3150 3.00 (prior to Fall 2016), or SC/BIOL 3150 4.00.

**Note:** Not eligible for Biology credit towards a Biology or Biochemistry program.

### Course Instructor(s) and Contact Information

**Instructor:** Dr. Joseph Smuczek

**Email:** [jsmuczek@yorku.ca](mailto:jsmuczek@yorku.ca)

## Schedule

**Weekly Asynchronous Content:** 2 or 3 pre-recorded lectures will be posted to eClass each week.

**Weekly Synchronous (Live) Zoom Sessions:** Mondays from 7:00pm – 8:30pm (EST)

- Zoom sessions will not take place during the first week of class or on weeks with a scheduled test.
- These sessions will allow you to ask content related questions in an open chat room.
- Sessions will require you to type questions into the chat
- Questions must be focussed on content presented in lecture
- Sessions will run until at least 8:00pm, but may be ended early at the discretion of the course director for various reasons (e.g. there are no further questions)
- Please keep in mind that these chat sessions are **open forums**. It is an opportunity for you to ask any questions you have about the course material. Please remember to be professional and respectful when participating.
- There is a zero-tolerance policy for unprofessional behaviour. Failure to remain professional will result in immediate removal from the session, a report made to the department, and in some circumstances the Zoom session being ended immediately.
- The Zoom sessions are recorded and chat logs are saved.
- Discussions that are not directly related to course content will not be permitted.

## Evaluation

### Evaluation Overview

Tests and Exams (2 tests and 1 final exam):	75%
Lecture-based quizzes (5 quizzes at 2% each):	10%
Independent Study Quizzes (3 quizzes at 5% each):	15%
	100%

### Detailed Evaluation Information

#### **Tests and Exams (75%):**

Test 1	20%	Online on <b>February 1<sup>st</sup>, 2021 from 7:00pm-9:00pm (EST)</b>
Test 2	27.5%	Online on <b>March 8<sup>th</sup>, 2021 from 7:00pm-9:00pm (EST)</b>
Final Exam	27.5%	Online. <b>Scheduled during the exam period (April 14<sup>th</sup> – April 28<sup>th</sup> 2021)</b>

All tests and exams are closed book and are to be completed independently and without use of any external resources (e.g. textbook, electronic devices, notes, peer-peer collaboration, etc.).

All tests and exams are completed through eClass. Tests and exams are cumulative. Any combination of the following question types may be used on tests and exams: multiple choice, short answer, essay style, matching, fill in the blanks, case studies, and/or calculations. Tests and exams may make use of sequential questioning (i.e. no going back to questions already answered).

Tests and exams will include all material covered in lecture and independent study topics that have been completed.

If you access or view a test or the final exam in any way it will be considered completed. The test and/or final exam will be graded (even if you do not complete any part of it and the grade is zero). A maximum of one attempt is allowed for each test or exam. Tests and exams must be completed at the scheduled time (see above).

If you miss a test or the final exam, please see the corresponding sections under “**Course Policies**”.

You must write at least one test to be eligible to write the final exam.

In the event that the eClass site is not functional during a regularly scheduled test, it will be rescheduled for the next regularly scheduled class date during the same block of time. In these circumstances, the course director will send further instructions and details to the students.

### **Lecture-based quizzes (10%)**

Quiz 1 Must be completed between **Mon. Jan 18<sup>th</sup> 2021 at 9:00am and Fri. Jan 22<sup>nd</sup> 2021 at 5:00pm**  
Quiz 2 Must be completed between **Mon. Feb 8<sup>th</sup> 2021 at 9:00am and Fri. Feb 12<sup>th</sup> 2021 at 5:00pm**  
Quiz 3 Must be completed between **Mon. Mar 1<sup>st</sup> 2021 at 9:00am and Fri. Mar 5<sup>th</sup> 2021 at 5:00pm**  
Quiz 4 Must be completed between **Mon. Mar 15<sup>th</sup> 2021 at 9:00am and Fri. Mar 19<sup>th</sup> 2021 at 5:00pm**  
Quiz 5 Must be completed between **Mon. Mar 29<sup>th</sup> 2021 at 9:00am and Fri. Apr. 2<sup>nd</sup> 2021 at 5:00pm**

All quizzes are completed on eClass. All due dates are Eastern Standard Time (Toronto). Each lecture based quiz is worth 2% of your final grade each. They will only include information in lecture videos posted from the week the quiz is written (i.e. you should listen to and review the lectures for that week before attempting the quiz). A maximum of one attempt and a maximum time of 45 minutes is allowed for each quiz.

Lecture-based quizzes close at 5pm on the due date regardless of the start time, so ensure that you begin your quiz at by 4:15pm the day it is due (or earlier if you have special time accommodations).

All quizzes are closed book and are to be completed independently and without use of any external resources (e.g. textbook, electronic devices, notes, peer-peer collaboration, etc.). All quizzes use theory based and case-based multiple choice questions only, and may make use of sequential questioning (i.e. no going back to questions already answered).

All times are in Eastern Standard Time (Toronto)

### **Independent study (15%)**

The independent study will cover the following topics: **basics of the immune system, basic virology, and HIV.**

A series questions will be given to you to answer about each topic. All questions can be answered using information found in the required textbook for the course. The answers to your questions are not to be handed in. Each component of the independent study will be evaluated by an online quiz worth 5% of your final grade and will have a maximum time of 60 minutes to complete. You only get one attempt to complete each quiz. The due dates for the independent study quizzes are as follows.

Independent Study Quiz #1 (Basics of the Immune System) – **Feb 5<sup>th</sup>, 2021 at 5:00pm (EST)**  
Independent Study Quiz #2 (Basic Virology) – **Feb 26<sup>th</sup>, 2021 at 5:00pm (EST)**  
Independent Study Quiz #3 (HIV) – **Mar 26<sup>th</sup>, 2021 at 5:00pm (EST)**

All quizzes are completed on eClass. All quizzes are closed book and are to be completed independently and without use of any external resources (e.g. textbook, electronic devices, notes, peer-peer collaboration, etc.). All quizzes are theory and case-based multiple choice questions and may make use of sequential questioning (i.e. no going back to questions already answered).

Independent Study Quizzes close at 5pm on the due date regardless of the start time, so ensure that you begin your quiz at by 4:00pm the day it is due (or earlier if you have special time accommodations).

Independent study topics may also be covered on tests and the final exam.

### **Online Proctoring for Examinations**

This course may use online proctoring for examinations. The instructor may use an online proctoring service to deliver the exam(s), which would be administered through the Learning Management System (e.g. Moodle, Canvas, etc.). Students are required to have access to minimum technology requirements to complete examinations. If an online proctoring service is used, students will need to become familiar with it at least five days before exam(s). For technology requirements, Frequently

Asked Questions (FAQs) and details about the online proctoring service visit: <https://registrar.yorku.ca/proctortrack-faq>. Students are required to share any IT accommodation needs with the instructor as soon as they are able.

## Important Dates

Important Administrative Dates: <https://registrar.yorku.ca/enrol/dates/fw20>

**Drop Deadline:** Fri. Mar. 12<sup>th</sup>, 2021 (last day to drop without course on transcript)  
**Course Withdrawal:** Sat. Mar. 13<sup>th</sup> to Apr. 12<sup>th</sup>, 2021 (course still appears on transcript with 'W')

Test 1 **Monday February 1<sup>st</sup>, 2021 from 7:00pm-9:00pm (EST)**  
Test 2 **Thursday, March 8<sup>th</sup>, 2021 from 7:00pm-9:00pm (EST)**  
Final Exam **To Be Announced**

See “**Evaluation**” section for lecture-based quiz and independent study quiz due dates.

## Resources

### Required Textbook:

“Microbiology with Diseases by Taxonomy, 6th Edition” Bauman, Pearson Publishing.  
ISBN: 9780135800010  
E-text is acceptable to use.  
Previous editions are not recommended and may contain out of date information.

### Optional Resources

I make use of two other resources in this course. You are not required to purchase them, but in my opinion they are good clinical and microbiology resources.

“Microbiology. Fourth Edition”, Cornelissen et al., Wolters Kluwer Publishing.  
ISBN: 9781975118051

“Brock Biology of Microorganisms. Sixteenth Edition” Madigan et al., Pearson Publishers.  
ISBN: 9780135860717

## Learning Outcomes

Upon successful completion of this course, students should be able to:

- Describe the basic structure, function and growth of bacteria, and structure and function of viruses. Complete calculations related to growth of bacteria.
- Recognize select bacteria based on Gram staining, morphology, arrangement and results of other laboratory techniques/methods
- Describe the various ways that microorganisms can cause disease in humans (i.e. pathogenic mechanisms)
- Identify classes of bacteria and their clinical importance in human disease
- In specific disease processes where more than one microorganism can be the cause, differentiate those organisms based on laboratory techniques and findings
- Describe the mechanisms of action of the classes of anti-microbial agents and the mechanisms of antimicrobial resistance
- Describe the basic structure and function of the human immune system

- Describe the meaning and significance of the terms and complete calculations involving: basic reproduction number, effective reproductive number and herd immunity

## Course Content

### Tentative Lecture Topics and Schedule (Subject to change)

#### Overview of Microbiology/Introduction to Microbiology

##### I. Overview of Microbiology

##### II. Prokaryotic vs Eukaryotic Cells

##### III. Bacteria:

- The Gram Stain
- Differences between gram positive and gram negative bacteria
- Bacterial replication and genetic variation
- Microbial growth cycle and quantification of exponential growth of bacteria
- Factors affecting bacterial growth
- Growth media and culturing techniques
- Sterilization techniques/Aseptic technique

#### Basic Concepts in Medical Microbiology and Medically Important Microbes

##### I. Normal Human Microflora

##### II. Harmful/pathogenic bacteria and interactions with humans

##### III. Specific bacteria and the diseases they cause:

###### a. Gram Positive Cocci:

- Staphylococcus*
- Streptococcus*

###### b. Gram Positive Rods:

- Corynebacterium diphtheria* (Diphtheria)
- Bacillus anthracis* (Anthrax)
- Listeria monocytogenes* (Listeriosis)

###### c. Gram Negative Cocci:

- Neisseria gonorrhoeae* (Gonorrhea)
- Neisseria meningitides* (Meningitis)

###### d. Gastrointestinal/Enteric Gram Negative Rods

- Escherichia coli* (ETEC and EHEC) and the Walkerton Water Crisis
- Salmonella*
- Vibrio cholerae* (Cholera)
- Helicobacter pylori* (Peptic ulcers and gastritis)

###### e. Non-gastrointestinal Gram Negative Rods

- Bordetella pertussis* (Whooping Cough)
- Pseudomonas aeruginosa* (Multiple infection types)

###### f. Other Gram Positive Rods

- i. *Clostridium botulinum* (Botulism and Botox)
- ii. *Clostridium tetani* (Tetanus)
- iii. *Clostridium difficile* (Antibiotic-associated diarrhea)

g. Spirochetes and Rickettsiae

- i. *Treponema pallidum* (Syphilis)
- ii. *Borrelia burgdorferi* (Lyme Disease)
- iii. *Rickettsia rickettsii* (Rocky Mountain Spotted Fever)
- iv. *Rickettsia prowazekii* (Typhus)

h. Chlamydiae

- i. *Chlamydia pneumoniae* (Pneumonia)
- ii. *Chlamydia trachomatis* (Chlamydia)

i. Mycobacterium tuberculosis

IV. Antibiotics

- a. Beta lactams
- b. Tetracyclines
- c. Inhibitors of Protein Synthesis
- d. Mechanisms of Resistance

V. Epidemiology: Prevalence, Incidence, Basic Reproduction Number and Herd Immunity

VI. Virology and HIV (Independent Study Questions)

VII. Immune System (Independent Study Questions)

## Experiential Education and E-Learning

**Course Website:** eClass

To access eClass, please follow these instructions:

- a. Go to: <http://eClass.yorku.ca>
- b. Log in with your Passport York account.

## Other Information

For the quizzes, tests and final exam, you must know and understand the material presented in the lectures and the information included in the independent study topics.

The textbooks can help consolidate and expand understanding of the material. However, specific material in the textbook that is not covered in this course will not be on any of the quizzes, tests or final exam.

## Course Policies

### Policies for a Missed Test(s)

- You must send an email with a valid reason for missing a test before the regularly scheduled test opens
- An email regarding a missed test must be sent to [jsmuczek@yorku.ca](mailto:jsmuczek@yorku.ca) and it must be sent from the student's @yorku.ca email address
- Reasons for a missed test will be considered on a case by case basis and may require documentation, as requested by the course director
- If a make-up test is granted, it will be in the form of a **virtual oral exam**
- Video conferencing software will be used to administer the virtual oral exam (i.e. Zoom)
- Virtual oral exams must be scheduled **within two weeks of the scheduled midterm**.
- Virtual oral exams must be scheduled during the hours of 8:00am and 7:00pm (EST) on Monday – Friday

- For the virtual oral exam, students are required to have Zoom access, audio capabilities, video capabilities, screen sharing capabilities, and word processing software (e.g. Microsoft Word). The virtual oral exam will not occur without these capabilities/software, and a grade of zero (%) will be applied.
- Virtual oral exams **will be recorded** by the course director only. No other audio or video recording of the virtual oral exam is permitted.
- As an alternative to it being recorded, a witness (e.g. one of the teaching assistants or another biology faculty member) must be present during the virtual oral exam. The witness will be selected by the course director. If this option is chosen, it must be requested at the time that the student notifies the course director of their absence from the regularly scheduled midterm (regularly scheduled midterms include Monday February 1<sup>st</sup>, 2021, and Monday March 8<sup>th</sup> 2021 from 7:00pm-9:00pm.).
- Virtual oral exams may include short answer questions, discussion questions, case-based questions, and calculation style questions
- Virtual oral exams are closed book, and must be completed independently with no external resources (e.g. textbook, electronic devices, notes, peer-peer collaboration, etc.)
- If the virtual oral exam is not scheduled or it is missed, a grade of zero (%) will be applied
- If there are exceptional circumstances, they will be considered on a case by case basis
- **Students must write at least one test to be eligible to write the final exam**

#### **Policies for a Missed Final Exam**

- If you cannot write the final exam at the scheduled time/date, you must apply for deferred standing.
- If deferred standing is approved, the time and date of the exam will be at the discretion of the course director.
- If the deferred standing is not approved, you must petition to your home faculty. Any denied petitions will receive a grade of zero (%) on the final examination.

#### **Policies for Technology Difficulties During Quizzes/Tests/Final Exam**

- If students have difficulty completing or starting a Quiz/Test/Final exam due to an issue with the internet connection, the course director must be notified immediately.
- Evidence of this from your internet company may be required by the course director.
- Decisions on matters for technology difficulties during quizzes/tests/final exams will be considered on a case by case basis.

#### **Policies for Quizzes**

- Quizzes will not be made available after the due date.
- Quiz deadlines will not be extended. You should plan to complete all quizzes with sufficient time well before the posted deadline.
- If you access or view a quiz in any way, it is considered completed (even if you do not complete any part of it).
- If there are exceptional circumstances, and you are unable to complete the quiz in the 1-2 week timeframe that it is available, an email explaining your situation will be required at least **1 day before the quiz closes**. If your exceptional circumstances are accepted, the weight of the quiz will be added to the final exam. These requests will not automatically be granted. They will be considered on a case by case basis. Not being able to accept a grade of zero because a quiz was not completed by the due date is not an extenuating circumstance.
- If students enroll in the class after the due date of the first lecture based quiz, students who notify the course director of this in an email prior to writing their second-lecture based quiz will have the weight of their first lecture based quiz added to their final exam.
- Exceptional circumstances will be considered on a case by case basis.

#### **Regrading Short Answer/Essay/Calculation/All manually-graded questions**

- You must submit an emailed rationale for a reappraisal based on academic grounds to [jsmuczek@yorku.ca](mailto:jsmuczek@yorku.ca) within **one week** of the graded material being made available to you. If it is determined that you have offered sufficient academic grounds, the material will be regraded.
  - Requests for regrading made after the one week period will not be considered
- Requests that are not acceptable academic grounds will automatically be denied. Examples include, but are not limited to:
  - Comparison of grades with others.

- Indicating that more points should have been awarded without an explanation of why the grade is factually wrong.
- Sending screen shots of answer(s) and indicating directly or indirectly that you believe that your answer is complete and not giving an academic reason/reasons.
- Using material not covered in class as an argument.
- **Reappraisal may result in the grade being raised, confirmed or lowered.**
- Once reappraisal is completed, the decision made by the course director is final.

### **Regrading Multiple Choice Questions**

- Under **no circumstances** will alternate answers for multiple choice questions be considered
- The course director will review each multiple-choice question to ensure that the preferred answer is the best answer.

I appreciate that grades are important to you and all of your classmates. In order to be fair and consistent with regard to the entire class, individual grades are not negotiable. I cannot offer “extra credit” assignments. Marks for tests, quizzes and final exam are not “bell-curved”. In all circumstances, grades are rounded to the nearest percent to determine the overall letter grade. A grade ending in XX.01-XX.49 is rounded down to the nearest percent. A grade ending in XX.50-XX.99 is rounded up to the nearest percent.

### **Intellectual Property**

- All material presented is designed to be used by Winter 2021 BIOL2905 students only.
- I hold the copyright to all material in this class.
- Material is distributed to Winter 2021 BIOL 2905 only and distributed by the course director only.
- Any instances of copying, distributing, posting course content to external sources, including but not limited to websites or paid subscription websites may lead to legal consequences for violating copyright law and/or a charge of misconduct under York’s Code of Student Rights and Responsibilities and the Senate policy on Academic Honesty

### **Email and Course Communication**

- Emails take an average of **3 working days to respond to** (not including weekends or holidays), but during busy times (e.g. exams, midterms) it may take longer.
- Before you send an email, please review the course syllabus, and information on eClass. Any information already posted in the course syllabus or on eClass will not receive a reply.
- Emails must meet the following requirements in order for them to receive a reply:
  - Emails must be sent to [jmuczek@yorku.ca](mailto:jmuczek@yorku.ca)
  - Emails must be sent from your @yorku.ca email address
  - Emails must not be rude, harassing, or abusive. These will not be tolerated and will be reported to the department
  - Emails must include your student ID and your name
  - Emails must be professional (salutation, closing, full sentences, NO texting lingo, etc.)
- **Do not** use the eClass messaging system to contact me
- Emails asking for individual grades to be modified, or extra assignments to be given will not receive a reply
- Emails asking about when grades will be posted will not receive a reply

### **Other Course Related Matters**

- All content in this course will be delivered remotely and all matters related to course policies will be addressed remotely.
- All course related matters must be in compliance with York University Policies.

## **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 - <https://www.glendon.yorku.ca/counselling/>

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

### **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 and submit an [Examination Accommodation Form](#) at least 3 weeks before the exam period begins. The form can be obtained from Student Client Services, Student Services Centre or online at <https://secure.students.yorku.ca/pdf/religious-accommodation-agreement-final-examinations.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/>