

**MICROBIOLOGY 202 (2019W, TERM 1)**  
**INTRODUCTORY MEDICAL MICROBIOLOGY AND IMMUNOLOGY.**

**GENERAL INFORMATION**

**Purpose:**

To introduce students to the major concepts and current ideas in (1) Immunology, (2) Pathogenesis of Bacterial Diseases and (3) Virology. Prerequisite: BIOL112, BIOL200, MICB201 or SCIENCE 1.

**Instructors:**

Dr. L. Osborne, LSC 3507, losborne@mail.ubc.ca

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Dr. T. Kion, Wesbrook Building 125/Biol. Sci. 3146, tkion@mail.ubc.ca

If emailing instructors or TA, please remember to put MICB 202 in the subject heading and include your student number. Please contact **Dr. Kion** regarding course registration, midterm conflicts, missed midterm and final examinations.

**TA:** Virginia Pechler (Virginia will answer questions using the Canvas Discussion Board).

Instructor and TA office hour times and locations to be announced on Canvas.

**Course Reading Package:**

All students must purchase the MICB202 Reading Package. Information on how to purchase a copy will be posted on the Canvas website. The reading package is not sold at the UBC Bookstore.

The MICB 202 notes for 2019W is quite different for the Bacterial Diseases Segment; therefore, it is imperative that students **do not use** older versions of the course notes, otherwise they will miss key testable information.

All of the material in the MICB202 Reading Package is required reading and can be the subject of exam questions, even if not covered during the lecture periods.

**Course Web Site:**

The MICB202 Canvas Site will be used as an important learning resource. Learning objectives, lecture materials, review questions, practice exams and links to site containing relevant animations are posted. Students can access this site at **canvas.ubc.ca** using their Campus Wide Login. Material posted in instructors' slides is also considered testable. Further clarification will be provided in lectures.

## Learning objectives:

At the end of the course, the students will have a general understanding of the different types of disease-causing pathogens and how they try to evade the body's immune system. The students will also have a basic understanding of the different ways in which the immune system fights microbial disease. They will also understand the basic concepts underlying many important health issues including AIDS, vaccines and the proper use of antibiotics.

MICB202 strives to reinforce and illustrate concepts in cell biology, molecular biology and biochemistry that students have been exposed to in BIOL200 and BIOL201. It also prepares students for more advanced courses in Microbiology, Immunology, Cell Biology and Biochemistry.

The course emphasizes a conceptual understanding of the cells and molecules involved in these processes and also seeks to connect these to real life examples that the students are familiar with. Where appropriate, quantitative skills are emphasized.

- Tuesday Sept 3<sup>rd</sup>, 2019 – First day of term.
- Wednesday Sept. 4<sup>th</sup>, 2019 – **first meeting of MICB 202.**
- Tuesday Sept. 17<sup>th</sup>, 2019 – Last day for change in registration and for withdrawal from most Term 1 courses without withdrawal standing of "W" recorded on a student's academic record.
- **Wednesday Oct. 9<sup>th</sup>, 2019 – Midterm exam, start time ~6:45 pm to 7 pm.**
- Friday Oct. 11<sup>th</sup>, 2019 – Last day for withdrawal from most Winter Session Term 1 courses with withdrawal standing of "W" recorded on a student's academic record. Course cannot be dropped without Faculty approval after this date on the SSC.
- Monday Oct. 14<sup>th</sup>, 2019 – Thanksgiving holiday, no classes.
- Monday Nov. 11<sup>th</sup>, 2019 – Remembrance Day holiday, no classes.
- Friday Nov. 29<sup>th</sup>, 2019 – Last meeting of MICB202.
- Friday Nov. 29<sup>th</sup>, 2019 – Last day of classes.
- Tuesday Dec. 3<sup>rd</sup> – Wednesday Dec. 18<sup>th</sup>, 2019 (inclusive) – Final exams. The final is scheduled by Enrolment Services. Check SSC in mid-October for the preliminary exam schedule.

## Grade Distribution:

Immunology: 34% (25% for the midterm - multiple-choice questions, 9% for participation).

Bacterial Diseases: 33% (30% for the final exam - multiple-choice questions, 3% for participation).

Virology: 33% (30% for the final exam - multiple-choice questions, 3% for participation).

Participation grade – The instructors may use different participation activities, some examples include iClicker questions, Canvas quizzes and in-class questions.

- The grading scheme is final and will **NOT** be changed. MICB202 grades are **NOT** scaled.
- The participation grades will only be added to the student's grade if they have a passing average on the combined midterm and final exams.

## Exams:

**Note: The Department of Microbiology and Immunology now has a policy of scheduling exams for large courses in the evening. This is to ensure that you can get the full time allotted for writing the exam. Students that have course conflicts should contact Dr. Kion.**

Midterm Examination: Wednesday, October 9<sup>th</sup> in the early evening (the start time will be between 6:45 and 7:00 pm). Students will be emailed the location and exact start time of the midterm a week before the midterm. The midterm will be 1 hour and 15 minutes in duration, and will consist of ~30 multiple-choice question blocks.

The date and time of the Final Examination is scheduled by Enrolment Services and is released during the middle of the term (<http://www.students.ubc.ca/coursesreg/exams/>). The final examination will be 2 hours and 30 minutes in duration, and will consist of ~60 multiple-choice question blocks.

The exam period is set for Tuesday Dec. 3<sup>rd</sup> – Wednesday Dec. 18<sup>th</sup>, 2019 inclusive. This means that you should **not** make airline reservations until you know your exam schedule. The Dean's Office **will not** permit students to write final examinations at alternate times because of travel conflicts.

- Exam questions will be multiple-choice format. **All exams are closed book. NO** electronic devices (*e.g.*, PDA, cell phone, translators) are permitted in the exams.
- The subject of at least 85% of the exam questions will be drawn from material in the course notes. 15% of the exam questions may be based on material covered by your instructor in class.
- Some parts of the course notes will not be explicitly dealt with during class time; nevertheless, students are still responsible for this material for exam purposes.
- Many exam questions will involve problem solving. You will need to integrate multiple concepts from different portions of a given segment (*e.g.*, immunology).
- Students are required to produce one piece of photo-identification during the exams. UBC Student ID is preferable.

**Final Examination:** Instructors cannot rearrange the date and time for students to write the final examination because of employment or travel conflicts *etc.* Students that are absent during the final exam must report to the Dean's Office as soon as possible and request a form for a Deferred Exam. The Dean's office will require valid documentation to explain your absence from an exam.

Deferred Exams are scheduled by the Registrar's Office and are usually held in the next examination period (*i.e.*, April 2020).

Note that instructors are not permitted to rearrange the times of final exams for students other than in a case of exam hardship. An exam hardship is defined as 3 exams within a 24-hour period (*i.e.*, 23:59:59). For example, Student "A" has an exam at 8:30 am, 12:00 noon and 7 pm; this is an exam hardship and the 2<sup>nd</sup> exam would be rescheduled (probably to the following day). An example of what is NOT an exam hardship: Student "B" has exams scheduled at 8 am, 12:00 noon, then 8 am the following day. The third exam is in the next 24-hour period.

### **Policy on Missed Midterm Exam:**

Midterm Exams: Students that miss an examination due to illness, course conflicts or family emergency are eligible to write the make-up midterm examination provided that they:

1. Contact Dr. Kion within 24 hours of the exam.  
Email: [tkion@mail.ubc.ca](mailto:tkion@mail.ubc.ca), put MISSED MICB202 EXAM and your student number in the subject heading.  
Department office: 604-822-3308 (ask that the information be forwarded to Dr. Kion)
2. Complete the self-declaration form and submit **a paper copy** to Dr. Kion. Also provide **a paper copy** of your UBC timetable.

A make-up exam will be scheduled 1 – 2 weeks after the original midterm date. The time will be determined after reviewing all students' schedules. Students will be contacted by email. If a student is unable to write the makeup midterm, the student should consult their advising office regarding a late withdraw from the course.

### **Reach Out for Success:**

University students often encounter setbacks from time to time that can impact academic performance. Discuss your situation with your instructor or an academic advisor. Learn about how you can plan for success at: [www.students.ubc.ca](http://www.students.ubc.ca).

For help addressing mental or physical health concerns, including seeing a UBC counsellor or doctor, visit: [www.students.ubc.ca/livewelllearnwell](http://www.students.ubc.ca/livewelllearnwell).

### **Student Responsibilities:**

Students are responsible for:

- **Confirming their registration in the course.**
- Maintaining an active email address that is registered with the University for the purpose of communicating with the instructors, the Dean of Science, and Enrolment Services.
- Consulting the MICB202 Canvas site on a regular basis for announcements and other posted information.
- Informing Dr. Kion within the first two weeks of class about any conflicts with the midterm date/time.
- Informing Dr. Kion within 24 hours of the exam if they had been absent due to illness or family emergency.
- Provide Dr. Kion with the self-declaration form to explain their absence. Without timely notification and documentation, a grade of "0" will be given for the exam.
- Arriving to class on time and not leaving before the class is dismissed.
- Turning off their cell phones during class time.
- Refraining from talk during class time that disturbs the other students.

### **Student Responsibilities (continued):**

- Refraining from distracting other students by playing video games, watching movies, sending email, *etc.*
- Refraining from eating or drinking in class.

### **Classroom Civility:**

To create and preserve a classroom atmosphere that optimizes teaching and learning, all participants share a responsibility in creating a civil and non-disruptive forum. **Students are expected to conduct themselves at all times in this classroom in a manner that does not disrupt teaching or learning.**

- You are expected to be on time. Class starts at 12 pm. You should be in your seat and ready to begin class at this time. Class ends at 12:50 pm. Packing up your things early is disruptive to others around you and the instructors.
- Classroom discussion should be civilized and respectful to everyone and relevant to the topic we are discussing. Any discussion from class that continues on Canvas or Piazza should adhere to these same rules and expectations.
- Electronic devices such as computers and cell phones must be turned off during class, unless you have informed the instructor ahead of time that you are expecting an emergency message.

### **Laptops in class:**

Over the past few years we have monitored students in MICB202 (and in other classes) as part of studies to develop more effective methods for teaching. There is no doubt that having your laptop on will decrease your attention in class. In some cases your laptop will be a detriment to people sitting near you. There will be no situation where you need to access your laptop during MICB202 classes (but you will need it outside of class!). We strongly urge you to leave it off. You will need to take notes for the class primarily to record topics that were emphasized and to record questions you have. All of the testable material will be available in the course notes or as supplements on the Canvas site.

### **Tutoring:**

Many private companies will offer tutoring services to students enrolled in courses at UBC, often for an hourly fee. The instructors of MICB202 do not support or endorse any of these services. The employees of these companies have had no contact or discussions with the instructors and **are not** provided with any of the course materials. Students are directed to use caution if hiring any of these companies. Appeals that the course grade was lower than expected because of incorrect information provided by these companies will not be accepted.

## **Academic Misconduct:**

From the UBC Academic Calendar: Academic honesty is essential to the continued functioning of the University of British Columbia as an institution of higher learning and research. All UBC students are expected to behave as honest and responsible members of an academic community. Breach of those expectations or failure to follow the appropriate policies, principles, rules, and guidelines of the University with respect to academic honesty may result in disciplinary action.

<http://www.calendar.ubc.ca/vancouver/index.cfm?tree=3,286,0,0>

What is academic misconduct?

Academic misconduct is behaviour that erodes the basis of mutual trust on which scholarly exchanges commonly rest, undermines the University's exercise of its responsibility to evaluate students' academic achievements, or restricts the University's ability to accomplish its learning objectives. See the following URL below for specific examples of academic misconduct.

<http://www.calendar.ubc.ca/vancouver/index.cfm?tree=3,54,111,959>

What happens if a student commits academic misconduct?

Academic misconduct often results in a one-year suspension from the University and a notation of academic discipline on the student's record. Other disciplinary measures include a letter of reprimand, a grade of zero for the assignment and/or for the course, suspension from the University, and expulsion from the University.

<http://www.students.ubc.ca/calendar/index.cfm?tree=3,54,111,960>

Examples of academic misconduct that would apply to MICB202 (this list is not comprehensive):

- Writing an exam for another student, or hiring someone to write your exam.
- Showing your answers to another student during an examination.
- Copying answers from another student during an examination or a Canvas assignment.
- Discussing answers to Canvas assignments with another student while doing the assignment.

## **Course Content:**

The following topics are covered in MICB202.

### **Immunology**

#### **Topic 1. Introduction to the Immune System.**

Introduction, Cells of the immune system, Location of the immune system.

#### **Topic 2. Innate Responses.**

Introduction, Anatomical and Physiological Barriers, Innate Immunity, The inflammatory response occurs after infection by microorganisms, The Complement (C') System.

## **Course Content (continued):**

### **Topic 3. Antigen Processing and Presentation.**

Introduction, MHC proteins, Antigen Processing and Presentation, MHC Diversity, Co-stimulatory Properties of Antigen-presenting Cells.

### **Topic 4. T cells, B cells and Antibodies of Adaptive Immunity.**

Introduction, T cells, T Cell Development, T regulatory cells, T Cell Activation, B Cell Development, B Cell Activation, Antibodies, Antibody Synthesis, Immunoglobulin Class Switching, Secreted Antibodies, Complement Activation by Antibodies.

### **Topic 5. Immune Responses to Pathogens.**

Introduction, Extracellular Bacterial Infections, Intracellular Bacterial Infections, Viral Infections, Responses to Protein Antigens (*e.g.*, toxins).

### **Topic 6. Unwanted Immune Responses.**

Introduction, Hypersensitivities, Graft Rejection.

### **Topic 7. Disorders of the Immune System.**

Introduction, Examples of Antibody-mediated Autoimmune Diseases, Examples of Cell-mediated Autoimmune Diseases, Immunodeficiency Diseases.

### **Topic 7. Antibodies as Tools in Medicine and Biology.**

Introduction, Diagnostic uses of antibodies, Polyclonal antisera, Monoclonal antibodies, ELISA, Blood typing, Immunofluorescence, Analyzing cells by FACS.

## **Bacterial Pathogenesis**

### **Topic 1. Virulence Mechanisms of Pathogenic Bacteria.**

Introduction, Concepts and Terminology, The Microbiota, Biofilms, Host Defense Mechanisms, Intracellular Existence, Epidemiology and the Spread of Disease, Therapy and Prevention of Bacterial Diseases, An Introduction to Pathogenesis, Isolation and Identification of Bacterial Pathogens, Regulation of Genes Encoding Virulence Factors, Bacterial Adherence, Avoidance of Phagocytosis, Toxins.

### **Topic 2. Pathogenic Bacteria.**

*Mycobacterium tuberculosis*, *Neisseria gonorrhoeae*, *Streptococcus pneumoniae*, *Vibrio cholerae*, Enterohemorrhagic *Escherichia coli* (EHEC), *Salmonella enterica* serovars *typhi* and *typhimurium*.

## **Course Content (continued):**

### **Virology**

#### **Topic 1. Viruses: Molecular diversity, properties and pathogenicity.**

What is a Virus?, Why Study Viruses?, Virus Structure, The Virus Replication Cycle, Classification of Animal Viruses, Cultivating Animal Viruses in the Laboratory, Pathogenesis of Viral Infections, Vaccine Production.

#### **Topic 2. Specific Virus Families.**

Picornavirus (Poliovirus) [structure, replication, pathogenesis, vaccines],

Orthomyxovirus (Influenza) [structure, replication cycle, pathogenesis, antigenic variation, vaccines, antivirals],

Retrovirus (HIV) [structure, replication cycle, pathogenesis, antigenic variation, vaccines, antivirals].