

**MICROBIOLOGY 202 (2016W, 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, Life Sciences Centre 3507, losborne@mail.ubc.ca

Dr. E. Gaynor, Life Sciences Centre 2558, egaynor@mail.ubc.ca

Dr. D. Krebs, Wesbrook 129, krebs@mail.ubc.ca

For all emails, please put MICB202 in the subject heading. The instructors will inform you of their office hours during their first lecture.

**Course coordinator:**

Dr. T. Kion, Wesbrook 125, tkion@mail.ubc.ca - please put MICB202 in the subject heading.  
(For emails regarding course registration, midterm conflicts, missed midterm and final examinations).

**Course Reading Package:**

All students must purchase the MICB202 Reading Package. The cost of the package is **\$15**, and can be purchased from the Microbiology and Immunology Student Association.

Please bring exact change. \$50 and \$100 are not accepted. Cheques cannot be accepted.

When: Wednesday September 7th to Friday September 16<sup>th</sup>, 12:00 noon to 2 pm.

Where: Wesbrook 133.

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 CONNECT 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 <http://lthub.ubc.ca/>, using their Campus Wide Login.

## **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.

## **Important Course Dates:**

- Tuesday Sept. 6<sup>th</sup>, 2016 – First day of term, classes cancelled so student can attend Imagine and the Microbiology and Immunology Department's Orientation Meeting.
- Wednesday Sept. 7<sup>th</sup>, 2016 – First day of classes. First meeting of MICB202.
- Tuesday Sept. 20<sup>th</sup>, 2016 – 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.
- Monday Oct. 10<sup>th</sup>, 2016 – Thanksgiving Day holiday – no classes at UBC.
- Friday Oct. 14<sup>th</sup>, 2016 – 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.
- Tuesday Oct. 11<sup>th</sup>, 2016 – Midterm, evening exam.
- Friday Nov. 11<sup>th</sup>, 2016 – Remembrance Day holiday – no classes at UBC.
- Friday Dec. 2<sup>nd</sup>, 2016 – Last meeting of MICB202.
- Friday Dec. 2<sup>nd</sup>, 2016 – Last day of classes for term 1.
- Tuesday Dec. 6<sup>th</sup> – Wednesday Dec. 21<sup>st</sup>, 2016 (inclusive) – Winter exam session. The final is scheduled by Enrolment Services. Check SSC in mid-October for the preliminary exam schedule. See the following section.
- Tuesday Jan. 3<sup>rd</sup>, 2017 – Term 2 courses begin.

## **Grade Distribution:**

Midterm Exam – 34% (Immunology component only, multiple-choice questions).

Final Exam – 66% (Bacterial Diseases - 33%, multiple-choice questions and Virology – 33%, multiple-choice questions).

- The grading scheme is final and will **NOT** be changed. MICB202 grades are **NOT** scaled.

## 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: Tuesday, October 11<sup>th</sup> in the early evening (the start time will be between 6:30 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 32 - 36 multiple-choice questions.

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 64 - 72 multiple-choice questions.

The exam period is set for Tuesday December 6<sup>th</sup> – Wednesday December 21<sup>st</sup> 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.

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 Exams. 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 2017).

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. 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. provide valid documentation of illness or family emergency. A doctor's note must explain why you were unable to write (i.e., a note that says "was seen in my office this morning" does not explain why you were unable to write). This documentation must be accompanied with your name, student number, and email address. This documentation must be provided as a paper copy - electronic attachments are not accepted.

Only one 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.

**Students that are absent due to employment conflicts obligations are not eligible to write the make-up midterm.**

### **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 CONNECT 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 valid documentation 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 and pagers during class time.
- Refraining from talk during class time that disturbs the other students.
- Refraining from distracting other students by playing video games, watching movies, sending email, *etc.*
- Refraining from eating or drinking in class.

### **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).

### **Reach Out for Success (continued):**

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).

### **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 9 am. You should be in your seat and ready to begin class at this time. Class ends at 9:50 am. Packing up your things early is disruptive to others around you and to myself.
- Classroom discussion should be civilized and respectful to everyone and relevant to the topic we are discussing. Any discussion from class that continues on CONNECT should adhere to these same rules and expectations.
- Electronic devices such as computers, cell phones and pagers 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 cases 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 CONNECT 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.students.ubc.ca/calendar/index.cfm?tree=3,54,0,0>

## **Academic Misconduct:**

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.students.ubc.ca/calendar/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 CONNECT assignment.
- Discussing answers to CONNECT 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.

#### **Topic 3. Components of the Adaptive Immune System: What they are and how they work.**

Adaptive Immunity – An Overview, MHC proteins, Antigen Processing and Presentation, T Cell Development, T Cell Activation, Co-stimulatory Properties of Antigen-presenting Cells, Activation of T Helper Cells, Activation of Cytotoxic T Cells, B Cell Development, B Cell Activation, Antibodies, Antibody Structure, Antibody Synthesis, Structure and Function of Secreted Antibodies, Primary and Secondary Adaptive Immune Responses, Active and Passive Immunity.

#### **Topic 4. Immune Responses to Pathogens.**

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

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

### **Topic 5. Unwanted Immune Responses.**

Hypersensitivities, Graft Rejection.

### **Topic 6. Disorders of the Immune System.**

Autoimmunity, Immunodeficiency diseases, AIDS, Preventing and treating AIDS, Current Treatments for Persons with AIDS.

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

Medical uses of antibodies, Making monoclonal antibodies, ELISA, Blood typing, Immunofluorescence, Analyzing cells by FACS.

## **Bacterial Diseases**

### **Topic 1. Introduction to Bacterial Diseases**

Introduction, Concepts and Terminology, The Normal Flora, Biofilms, Host Defence Mechanisms, Therapy and Prevention of Bacterial Diseases, Isolation and Identification of Bacterial Pathogens, Epidemiology and the Spread of Disease, An Introduction to Pathogenesis.

### **Topic 2. Virulence Mechanisms of Pathogenic Bacteria.**

Bacterial Adherence, Avoidance of Phagocytosis, Toxins, Intracellular Existence, Regulation of virulence genes.

### **Topic 3. Bioterrorism.**

## **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].