

MICB302 – Immunology (2021W)

UBC provides resources to support student learning and to maintain healthy lifestyles but recognizes that sometimes crises arise and so there are additional resources to access including those for survivors of sexual violence. UBC values respect for the person and ideas of all members of the academic community. Harassment and discrimination are not tolerated nor is suppression of academic freedom.

UBC provides appropriate accommodation for students with disabilities and for religious and cultural observances. UBC values academic honesty and students are expected to acknowledge the ideas generated by others and to uphold the highest academic standards in all of their actions. Details of the policies and how to access support are available here (<https://senate.ubc.ca/policies-resources-support-student-success>)

Calendar Description: Cells, molecules, and mechanisms of innate and adaptive immunity. Antigen presenting cells and the major histocompatibility complex, T and B lymphocytes and their antigen receptors, T and B cell development, innate and adaptive immune responses against pathogens, diseases associated with aberrant immune responses.

Lectures: Monday, Wednesday and Friday, 9 am – 9:50 am.

Instructor:

Dr. Tracy Kion, tkion@mail.ubc.ca, Office hours – TBA (will be held on Zoom)

Teaching assistants:

Erin Goldberg
Abhishek Bedi
Brynn McMillian

Tutorial sessions/office hours will also be held on Zoom.

Course objectives:

- To reinforce and build upon important concepts in immunology and cell biology developed in MICB202 and BIOL200.
- To gain an in-depth understanding of the cells and molecules of the immune system, the immune responses to infection by pathogens, and how the immune response can sometimes cause disease. Selected case studies will be used to provide examples of the concepts of the immune response in the infection and disease.

MICB302 is the prerequisite for MICB402.

Covid Safety in the Classroom (current as of Sept. 6/21– information may change as the term progresses):

i. **Masks:** Masks are **required** for all indoor public spaces on campus, including classrooms, as per the BC Public Health Officer orders and UBC policy. For our in-person meetings in this class, it is important that all of us feel as comfortable as possible engaging in class activities while sharing an indoor space. For the purposes of this order, the term “masks” refers to medical and non-medical masks that cover our noses and mouths. Masks are a primary tool to make it harder for Covid-19 to find a new host. You will need to wear a medical or non-medical mask for the duration of our class meetings, for your own protection, and the safety and comfort of everyone else in the class. You may be asked to remove your mask briefly for an ID check for an exam, but otherwise, your mask should cover your nose and mouth. Please do not eat in class. If you need to drink water/coffee/tea/etc, please keep your mask on between sips.

Students who need to request an exemption to the indoor mask mandate must do so based on one of the grounds for exemption detailed in [the PHO Order on Face Coverings \(COVID-19\)](#). Such requests must be made through the Center for Accessibility (info.accessibility@ubc.ca).

Mask wearing protects you as well as others in your environment. Let’s do everything we can as a community to stop the spread of this virus.

ii. **Vaccination:** If you have not yet had a chance to get vaccinated against Covid-19, vaccines are available to you, free, and on campus. I will post the days/times/locations of vaccine clinics on the MICB302 Canvas Homepage. The higher the rate of vaccination in our community overall, the lower the chance of spreading this virus. You are an important part of the UBC community. Please arrange to get vaccinated if you have not already done so.

iii. **Seating in class:** To reduce the risk of Covid transmission, please sit in a consistent area of the classroom each day. This will minimize your contacts and will still allow for the pedagogical methods planned for this class to help your learning.

Your personal health

If you’re sick, it’s important that you stay home – no matter what you think you may be sick with (e.g., cold, flu, other).

- A daily self-health assessment is required before attending campus. Every day, before coming to class, complete the self-assessment for Covid symptoms using this tool: <https://bc.thrive.health/covid19/en> (this is also posted on the MICB302 Canvas Homepage).
- Do not come to class if you have Covid symptoms, have recently tested positive for Covid, or are required to quarantine. You can check this website to find out if you should self-isolate or self-monitor: <http://www.bccdc.ca/health-info/diseases-conditions/covid-19/self-isolation#Who>.

Your precautions will help reduce risk and keep everyone safer. In this class, the marking scheme is intended to provide flexibility so that you can prioritize your health and still be able to succeed

Do not come to class if you are sick, have Covid symptoms, have recently tested positive for Covid, or are required to quarantine. This precaution will help reduce risk and keep everyone safer. In this class, the marking scheme is intended to provide flexibility so that you can prioritize your health and still be able to succeed:

- We will use the best 4 of 6 Canvas quiz grades.
- We will use the best 3 of 4 case study grades.
- The communication assignment can be worth 15 to 25% of your course grade, and the weight of the midterm or final exam reduced.

If you do miss class because of illness:

- Make a connection early in the term to another student or a group of students in the class. You can help each other by sharing notes. If you don't yet know anyone in the class, post on the discussion forum to connect with other students.
- Consult the class resources on Canvas. We will post the readings and PowerPoint slides for each class day.
- Use the discussion forum for help
- Come to office hours (they're online, so you can join from anywhere).
- See the marking scheme for reassurance about what flexibility you have.
- If you are concerned that you will need to miss a particular key activity due to illness, contact us to discuss.

If you are sick on a midterm exam day, please email the instructor as soon as you are confident you should not come to the scheduled exam. We would strongly prefer that you contact us to make an alternate arrangement than for you to come to the exam while you are ill. If you do show up for an exam and you are clearly ill, you will be asked to leave and we will make alternate arrangements with you. It is much better for you to email ahead of time and not attend.

If you are sick on a final exam day, do not attend the exam. You must apply for deferred standing (an academic concession) through Science Advising no later than 48 hours after the missed final exam/assignment. Students who are granted deferred standing write the final exam/assignment at a later date. Learn more and find the application online:
<https://science.ubc.ca/students/advising/concession>

For additional information about academic concessions, see the UBC policy here:
<http://www.calendar.ubc.ca/vancouver/index.cfm?tree=3,329,0,0>

Instructor Health

If I am sick: I will do my best to stay well, but if I become ill, develop Covid symptoms, or test positive for Covid, then I will not come to class. If that happens, here's what you can expect:

- If I am well enough to teach, but am taking precautions to avoid infecting others, we may have an online session or two. If this happens, you will receive an email telling you how to join the class (the information will also be posted on Canvas). You can anticipate that this would very likely be a last-minute email. Our classroom will still be available for you to sit and attend an online session, in this (hopefully rare) instance.
- If we are not well enough to teach, another faculty member from M&I will teach a lecture or two.

Prerequisites and assumed background for this course:

- **MICB202 (Introductory Medical Microbiology and Immunology)** We will assume that you are familiar with the major concepts in immunology that were discussed in MICB202. We will go over some of the key points, but please review your notes from this course.
- **BIOL200 or equivalent (Cell Biology)** We will assume that you are familiar with cellular organization and the functions of various organelles, the basic structures of DNA, proteins and membranes, and important cellular functions including transcription, mRNA splicing, translation, and protein secretion. Please look at relevant sections in the “Essential Cell Biology” or “Molecular Biology of the Cell” textbooks to refresh your memory.

Important dates:

Sept. 30 – UBC closed, National Day of Truth and Reconciliation

Oct. 12 – UBC closed, Thanksgiving Holiday

Oct. 27 – Midterm (no class that morning)

Nov. 10 – Nov. 12 – no class, Reading break

Course Reading Package:

The MICB302 Course Reading Package has been moved online to Canvas. Students can copy and paste the notes into their own documents and annotate them as appropriate.

All of the material in the MICB302 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 MICB302 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.

Copyright:

All materials of this course (course handouts, lecture slides, assessments, course readings, *etc.*) on Canvas are the intellectual property of the Course Instructor or licensed to be used in this course by the copyright owner.

Redistribution of these materials by any means (*e.g.*, posting the course materials to another site such as Discord, Facebook, Chegg) without permission of the copyright holder(s) constitutes a breach of copyright and **may lead to non-academic discipline**. Please do not re-distribute course materials.

The purpose of the website is to:

- post figure sets, review questions, and other study aids.
- provide a forum for students to exchange views about the course and the course material (Discussion board).
- post news items and research items relating to current developments in immunology research.

The purpose of the lecture period is to:

- convey the important concepts that you will need to know for the exams using figures from the textbook as well as other figures to enhance your understanding of the material.
- point out areas of active research in immunology.

iClicker Cloud:

We may use iClickers in class to answer multiple-choice questions in many of the lectures, but they will not be used for any part of the course grade.

UBC has provided a subscription to iClicker Cloud for all students. iClicker Cloud will work similar to the iClicker system that you have used in the classrooms, but you'll use your phone or tablet to answer questions. A student guide to iClicker Cloud can be found here <https://lthub.ubc.ca/guides/iclicker-cloud-student-guide/> (this link is also on Canvas).

Learning objectives: By the end of the course, you should be able to:

1. Identify the major mechanisms (inflammatory responses, cytotoxic T cells, antibodies) by which immune cells protect us from different types of pathogens (viruses, extracellular bacteria, intravesicular bacteria, parasites) or from cancer cells.
2. Understand how immune cells detect the presence of pathogens and cancer cells (pattern recognition receptors, antigen receptors, antigen presentation pathways, NK cell receptors).
3. Describe processes that lead to the elimination of pathogens (*e.g.*, opsonization, phagocytosis, neutralization, complement activation, cell-mediated cytotoxicity).
4. Describe the structure and function of key molecules that mediate immune responses including antibodies, antigen receptors, Toll-like receptors, MHC proteins, cytokines, chemokines.
5. Describe the main cell types of the immune system including their development, function, and for lymphocytes, how they generate antigen receptors.
6. Understand the processes that occur during T and B cell development that allow these cells to become tolerant to self-antigens and responsive to other antigens.

7. Describe the function of T and B lymphocytes in an immune response
8. Describe all the innate and adaptive processes involved in an immune response to a pathogen (*i.e.*, how immune cells perceive a pathogen, how they respond to it and how this usually results in clearance of the pathogen and a return to homeostasis).
9. To be able to predict what type of immune response you would need to combat a particular type of pathogen.
10. Describe how defects in immune cell regulation can lead to immunodeficiency diseases, autoimmune diseases and allergies.
11. Describe the basis for and application of current experimental approaches in immunology including, knockout and transgenic mice, CRISPR/Cas and Cre-lox gene editing.
12. Relate processes that occur in immune cells to similar processes that occur in all cell types and which have been described in previous cell biology courses (*e.g.*, mRNA splicing, protein secretion, receptor signaling).

Tutorials:

The tutorials will not run as formal tutorial sessions but as informal sessions or office hours for the TAs. During this time, you can ask your TAs questions about the course content or the review questions on the Canvas chapters. You can also ask them about research. **Tutorials will start week 3 (week of Sept. 20th).**

Grade Distribution:

Canvas Quizzes – 15% of course grade – consisting of multiple-choice questions (MCQs) and/or short answer questions (SAQ) and/or matching questions (MQs). Best 4 of 6 quiz grades are used in the calculation of the course grade.

Canvas Case Study assignments – 15% of course grade – a short story about a patient with a problem with their immune system. Students' understanding of the problem will be assessed by pre-case study MCQs and post-case study SAQs. Best 3 of 4 case study grades are used in the calculation of the course grade.

Students are expected and required to work independently on the quizzes and assignments.

Communication assignment – 15% – 25% of course grade*– students will be required to find a current research paper (from Jan. 2021 onwards) of any immunology topic (it must be a research paper and not a review paper). After reading the paper, the students will write an essay in the style of Scientific American or The Scientist (*e.g.*, an article that could be read and understood by someone with an interest in science, but not necessarily a scientist themselves, or by a scientist in a different field of science). The paper should be approximately 700 – 1000 words in length. Students are required to

have found their research paper by Oct. 11th – you will be asked to submit the name of the authors, article title, and a PDF copy on Canvas. Additional information is posted on Canvas.

Students are encouraged to peer review each other's papers, but will submit the assignment independently.

Midterm examination – 15 – 25% of course grade* – scheduled for October 28th. Details about the midterm exam will be released a week before the exam (*e.g.*, the content that is eligible for examination). The information will be sent by email using the University's registration system and will be posted on Canvas. Therefore, it is important that your email address is recorded with the University.

Final examination – 30 – 40% of course grade* – will be held during the final exam period. The final exam will be comprehensive, but more emphasis will be placed on the content from the after the midterms cut-off date. The material in the latter part of the course builds on earlier material; thus, you will need to be familiar with the major concepts from the first half of the course.

*Your course grade will be initially calculated using the communication assignment grade counting 15% towards your grade course and the midterm and final exams grades counting 25% and 40% towards your course grade respectively. It will then be re-calculated using the communication assignment grade counting 25% towards your grade course. If the midterm exam grade is lower than the final exam grade, the midterm will count 15% towards your course grade. If the final exam grade is lower than the midterm exam grade, the final exam will count 30% towards your course grade. You will then receive the higher of the two possible course grades.

The exam period is set for Saturday Dec. 11th – Wednesday Dec. 22nd, 2021 inclusive. Exams are scheduled for 7 days a week (*i.e.*, exams can be on Sunday).

Missed Final Exams: 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 Enrolment Services and are usually held in late July/early August.

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 (actually, 23:59:59 hours). For example, Student "A" has an exam at 8:30 am, 12:00 noon and 7 pm; this is an exam hardship and the 2nd 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.

Alternate Assessment Application:

The expectation in this course is that major assessments (*e.g.*, midterms, final exams) are written in person. You may be in a situation that prevents you from coming to campus (*e.g.*, geographic location, medical or extenuating circumstances). If you are in this situation, you must apply for alternate format assessments through Science Advising. Application and more information available online.

<https://science.ubc.ca/students/blog/applying-alternate-format-assessments-online-courses>

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.

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

For tips to address the transition to online learning, visit: <https://keeplearning.ubc.ca>.

Supporting Learning with Academic Integrity (adapted from Dr. C. Rawn, Dept. of Psychology, UBC).

In the academic community—a community of which you are now a part—we deal in ideas. That’s our currency, our way of advancing knowledge. By representing our own and others’ contributions in an honest way, we are (1) respecting the rules of this academic community, and (2) showcasing how our own novel ideas are distinct from but relate to their ideas. This gives us a formal way to indicate where our ideas end and where others’ begin.

But academic integrity goes well beyond formal citation. **Welcome to the academic community. You are expected to act honestly and ethically in all your academic activities, just like the rest of us.**

Make sure you understand UBC’s definitions of **academic misconduct**, **consequences**, and expectation that students must clarify how **academic honesty** applies for a given assignment. *Please ask if you’re not sure.* <http://www.calendar.ubc.ca/vancouver/index.cfm?tree=3,54,111,959>

(While you’re checking out the calendar, you might want to check out the “**Student Declaration and Responsibility**” statement you agreed to when you registered.

<http://www.calendar.ubc.ca/vancouver/index.cfm?tree=3,285,0,0#15613>

What does academic integrity look like in MICB302?

At any time: if you are unsure if a certain type of assistance is authorized, please ask. If you have a need that is unmet by existing course materials, course structure, and/or our learning community members, please ask.

DO your own work. All individual work that you submit should be completed by you and submitted by you. All assessments, large and small, are designed to help you learn and understand the concepts in the course and apply your knowledge to solve problems.

- It is *unacceptable* to buy/sell/swap/share assignment questions or answers on any platform.
- It is *unacceptable* to misrepresent your identity by using someone else to complete any portion of a course (*e.g.*, comment on a discussion board, complete a quiz question).
- It is *unacceptable* to help someone else cheat.

- It is *unacceptable* to copy answers from the course notes.

AVOID collusion. Collusion is a form of academic integrity violation that involves working too closely together *without authorization*, such that the resulting submitted work gains unfair advantage over other students because it is a measurement of the *group/pair/others'* understanding rather than the *individual* understanding. For example, collusion on an open book assignment or test includes working together to write answers or answering someone else's question in any forum. Assignments that are explicitly the product of group collaboration *have authorization*, so don't count as collusion.

Can I work with a classmate to co-create study notes? Yes, you can create your own original collaborative notes, but it is *unacceptable* to post them on file-sharing websites (*e.g.*, CourseHero, GoogleDocs). I recommend using the features in Canvas groups to ensure your work remains protected. Send me a message using Canvas Inbox, and I'll create a Group just for you. That will allow you to upload and share notes, and to work collaboratively on Pages ([see this site for an introduction to these features](#)). I also recommend starting your collaboration with a written agreement that addresses integrity issues, such as these: *Who else can see/use/contribute to these notes? How will we ensure we are not violating copyright?*

DO NOT share materials provided for you to use in this course. We are working hard to provide all the materials you need to succeed in this course. In return, please respect our work. All assignment instructions, quiz questions and answers, discussion questions, announcements, PowerPoint slides, audio/video recordings, Canvas modules, and any other materials provided to you by the Teaching Team are for use in this course by students currently enrolled in MICB302 section 101.

- It is *unacceptable* to share any of these materials beyond our course, including by posting on any course content on file-sharing websites (*e.g.*, CourseHero, GoogleDocs).
- Respect the Teaching Team and textbook authors' intellectual property, and follow copyright law.