



MICR*3230 Immunology

Fall 2023

Section(s): C01

Department of Molecular and Cellular Biology

Credit Weight: 0.50

Version 1.00 - August 23, 2023

1 Course Details

1.1 Calendar Description

This course provides an introduction to the immune response of the vertebrate host, the cells and tissues of the lymphoid system, humoral and cell-mediated immunity, the concept of immunity to diseases and current techniques in immunology.

Pre-Requisites: BIOL*1090, BIOC*2580

1.2 Course Description

This introductory Immunology course places emphasis on exploring the cellular and molecular mechanisms that underlie the immune response in mammals. Its primary objective is to provide students with a comprehensive understanding of the fundamental concepts surrounding innate and adaptive immunity. The course delves into topics such as the immune response's typical behavior during infection and immunization, as well as the implications of immune dysfunction in the context of allergy and autoimmunity.

1.3 Timetable

Classes will be held Tuesdays and Thursdays from 11:30 am - 12:50 pm.

Room: WMEM (War Memorial Hall)

Exceptions: Guest lectures will be delivered virtually on the following dates: Sep. 28, Nov. 7, Nov. 9, and Nov. 16

1.4 Final Exam

Date: Thursday, Dec 07, 2023

Time: 8:30-10:30 am

Location: TBD

The final exam will be in-person.

2 Instructional Support

2.1 Instructional Support Team

Instructor:	Priyanka Pundir
Email:	micr3230@uoguelph.ca
Telephone:	519-824-4120 x54389

2.2 Teaching Assistants

Teaching Assistant 1: Benjamin Muselius

Teaching Assistant 2: Mayara Da Silva

TAs will host weekly office hours. Details can be found on Courselink.

2.3 Guest Instructors

Sep. 21 – Dr. Matthew Sorbara, University of Guelph

Sep. 28 – Dr. Xintong Dong - University of Texas, Dallas

Oct. 17 – Dr. Jennifer Geddes-McAllister, University of Guelph

Nov. 07 – Dr. Clayton MacDonald, Trillium Health Partners

Nov. 09 – Dr. Dustin Green - University of Texas Medical Branch, Galveston

Nov. 16 – Dr. Clayton MacDonald, Trillium Health Partners

3 Learning Resources

3.1 Required Resources

Courselink (Website)

<https://courselink.uoguelph.ca>

Course material, announcements, and grades will be regularly posted to the MICR*3230 Courselink site. You are responsible for checking the site regularly.

The online discussion boards are intended for conversations related to the course content exclusively. Any posts not relevant to the course are not allowed. We value your input on class-related matters, but if you have suggestions or concerns about the course itself, please communicate those directly to the instructors instead of sharing them on the forum. Any posts that are considered inappropriate will be taken down.

3.2 Recommended Resources

Immunobiology (Textbook)

Janeway's Immunobiology, 10th Edition, by Kenneth M Murphy, Casey Weaver and Leslie J Berg, 2022, W.W. Norton.

3.3 Tutorial & Question and Answer sessions

Twice a week on Wednesdays from 2:00 - 2:30 pm and Fridays from 10:00 - 10:30 am, an online tutorial and question and answer session will be facilitated by the Teaching Assistants using the Courselink Virtual Classroom.

3.3 Etiquette

In the context of all interactions within the course, be it with fellow students, teaching assistants, or instructors, it is **imperative to uphold an atmosphere of respect and courtesy**. Any form of communication perceived as disrespectful or intimidating will be subject to strict scrutiny and handled with due seriousness.

4 Learning Outcomes

Course Learning Outcomes

By the end of the course, students will possess the ability to:

1. Identify key components such as organs, cells, and molecules engaged in the body's response to pathogens. Describe the mechanisms involved in eliminating pathogens and providing subsequent protection.
 2. Explain the significance of processes such as hematopoiesis, lymphocyte differentiation, and the establishment of immunological memory.
 3. Recognize and describe the mechanisms of immune regulation.
 4. Recognize immune-related disorders, including allergies, immune deficiencies, and autoimmune conditions, and articulate the underlying mechanisms triggering the onset of these disorders.
 5. Effectively present and critically evaluate a scientific article in basic immunology.
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5 Teaching and Learning Activities

5.1 Lecture

Topics:

PART	DATE	LECTURE TOPIC	CHAPTER
PART I: An Introduction to Immunobiology and the Innate Immunity	Sep 07	Basic Concepts of Immunology	1
	Sep 12	Principles of Innate and Adaptive Immunity	1
	Sep 14	Cellular Mechanisms of Innate Immunity	3
	Sep 19	The Complement System	2
	Sep 21	Online Quiz #1 Guest Lecture - Microbiome	
PART II: The Recognition of Antigen	Sep 26	Antigen Recognition	4
	Sep 28	Antigen Receptor Generation	5
	Oct 03	Antigen Presentation	6
	Oct 05	Online Quiz #2 Lymphocyte Receptor Signaling	7

	Oct 12	Midterm Review	
	Oct 17	Guest Lecture - One Health	
	Oct 19	MIDTERM EXAM (In-person during class time)	
PART III The Adaptive Immune Response	Oct 24	T Cell-Development	8
	Oct 26	B Cell-Development	8
	Oct 31	T Cell-Mediated Immunity	9
	Nov 02	B Cell-Mediated Immunity	10
	Nov 07	Online Quiz #3 Immunological Memory and Vaccination	11, 16
	Nov 09	Guest Lecture - Neuroimmunology	
PART IV:	Nov 14	Immunity at Mucosal Surfaces	12

The Immune System in Health and Disease	Nov 16	Immunity to Infectious Pathogens	13
	Nov 21	Online Quiz #4 Autoimmunity and Transplantation	15
	Nov 23	Hypersensitivity and Allergy	14
	Nov 28	Guest Lecture – TBD	
	Nov 30	Final Exam Review	
	Dec 07	FINAL EXAM	

5.2 Learning Strategy

A structured interactive lecture and discussion strategy, using illustrations and multi-media, will be used to emphasize the basic concepts. Lectures will be face-to-face. Students are encouraged to read the topics before lecture discussions to enhance understanding and construct informal discussion groups to support their learning. Brief guided notes, to accompany the lectures, will be available via CourseLink website. Bi-weekly tutorials will be hosted to support additional learning.

Dr. Pundir will remain after class for 10 min for office hours. Any questions not covered can be sent to the course email and addressed by a Graduate Teaching Assistant or discussed and answered at the bi-weekly tutorials (these are here to support you! Please use them).

Students are encouraged to ask questions relating to the learning materials during class time.

Students are encouraged to take advantage of the support offered via bi-weekly Tutorials and Question and Answer Sessions on the topics covered during the lectures. In general, the average grade for the course is usually 70-72% in class sizes exceeding >450 students.

Quizzes will be posted remotely via Courselink; these will be multiple-choice and open book.

The Midterm examination will be conducted in-person and encompass various question formats, including multiple-choice, fill-in-the-blanks, true/false, and matching questions. Kindly ensure your presence for the midterm exam, as there will be no possibility to take the exam at a different time. Should you be unable to attend due to valid reasons, appropriate documentation, such as a note or email from a physician or your program counsellor, must be presented to be considered for academic accommodations. In such cases, the midterm scores will be carried over to the final exam evaluation.

The final exam is also scheduled for in-person administration and will encompass similar question formats as mentioned earlier. There will be no provision for an alternative time to take the final exam. If you happen to miss the final exam, you will be required to proceed with the deferred exam policy.

6 Assessments

6.1 Marking Schemes & Distributions

Form of Assessment	Weight of Assessment	Date of Assessment	Course Content/Activity
Quiz #1	5%	Thu, Sep. 21 Courselink	Chapters 1-3
Quiz #2	5%	Thu, Oct. 5 Courselink	Chapters 4-6
Midterm	35%	Thu, Oct. 19	Parts I and II, including guest

		(during normal class hours)	lectures
Quiz #3	5%	Tue, Nov. 7 Courselink	Chapters 8-10
Quiz #4	5%	Tue, Nov. 21 Courselink	Chapters 11-13, 16
Final	45%	Thu, Dec. 07 Location TBD	Parts I-IV, including guest lectures

6.2 Assessment Details

Quizzes: Four online quizzes (5% grade each) will be held during pre- and post-midterm sessions.

- The online quiz will be open for two days, i.e., 48 hours, where students will be expected to answer ten randomly generated multiple-choice questions.
- Once the session is begun, it must be completed within 30 min.
- Before beginning the quiz, computer functionality, proper battery charge/power connection etc., must be ensured for the successful completion of the quiz.
- No alternate quiz session will be available, resulting in the loss of marks towards the grade, should it be missed.

Midterm: An 80 min midterm examination (worth 35% of the grade) will comprise 60 multiple-choice and/or other objective types of questions where the best answer must be chosen.

- Some questions may emphasize the interpretation or explanation of experimental observations or diagrams.
- Any student missing the midterm examination will write an 80% final examination. Additional information is available

at: <http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml>

Final: A two-hour comprehensive and cumulative examination (worth 45% of the grade) will cover the entire course learning materials. The examination will involve 90 objective-type questions (e.g., True and False, multiple choice & some multiple-part questions).

- Some questions may require interpretation and explanation of experimental observations or diagrams.
- Students requiring service or accommodation, whether due to an identified, ongoing disability or a short-term disability, should contact the Student Accessibility Services as soon as possible at 519-824-4120 ext. 56208.
(website: <https://www.uoguelph.ca/csd/>)

7 Course Statements

7.1 Course Specific Notes

- Students are required to regularly check course announcements via Courselink.
- For a prompt response, emails should be sent to the course email account: MCB3230@uoguelph.ca for the graduate teaching assistants to monitor and answer.
- Students are encouraged to take advantage of bi-weekly Tutorials and Question-Answer Sessions by the Teaching Assistant.
- The use of cell phones during the lecture is prohibited.
- Electronic recording of classes is expressly forbidden without prior written consent of the instructor. When recordings are permitted, they are solely for the use of the authorized student. They may not be reproduced or transmitted to others without the express written consent of the instructor.
- Students are encouraged to participate in fair faculty and course evaluations, which will be announced in advance via the course website.
- Any unusual incident during the conduct of the examination must be immediately brought to the attention of Professors in the examination hall.
- You may bring to examination - a calculator, pen, or pencil but NOT backpack, earphones, or cell phone.
- Please contact the Course Coordinator for any matter concerning the course.

Online Behaviour

Inappropriate in-person or online behaviour will not be tolerated. Examples of inappropriate behaviour include:

- Posting inflammatory messages about your instructor or fellow students.
- Using obscene or offensive language.
- Copying or presenting someone else's work as your own.
- Adapting information from the Internet without using proper citations or references.
- Buying or selling term papers or assignments.
- Posting or selling course materials to course notes websites.
- Have someone else complete your quiz or a quiz for/with another student.
- Stating false claims about lost quiz answers or other assignment submissions.
- Threatening or harassing a student or instructor.
- Discriminating against fellow students, instructors and/or TAs.
- Using the course website to promote profit-driven products or services.
- Attempting to compromise the security or functionality of the learning management system.
- Sharing your username and password.
- Recording lectures without the permission of the instructor.

7.2 Grading

Indicate all course policies regarding in-semester tests and assignment submissions, including time and place for submission of assignments and explicit penalties for late submissions.

7.3 Religious Matters

As for religious matters, please refer to the university policies at:
<http://www.uoquelp.ca/hre/hr/hrholydays.shtml>

7.4 Academic Integrity

Academic integrity is integral to education and students are encouraged to review various policies at: <http://www.academicintegrity.uoquelp.ca/integrity.cfm>.

8 Department of Molecular and Cellular Biology

Statements

8.1 Academic Advisors

If you are concerned about any aspect of your academic program:

- Make an appointment with a program counsellor in your degree program. [B.Sc. Academic Advising](#) or [Program Counsellors](#)

8.2 Academic Support

If you are struggling to succeed academically:

- Learning Commons: There are numerous academic resources offered by the Learning Commons including, Supported Learning Groups for a variety of courses, workshops related to time management, taking multiple choice exams, and general study skills. You can also set up individualized appointments with a learning specialist.
<http://www.learningcommons.uoguelph.ca/>
- Science Commons: Located in the library, the Science Commons provides support for physics, mathematic/statistics, and chemistry. Details on their hours of operations can be found at: <http://www.lib.uoguelph.ca/get-assistance/studying/chemistry-physics-help> and <http://www.lib.uoguelph.ca/get-assistance/studying/math-stats-help>

8.3 Wellness

If you are struggling with personal or health issues:

- Counselling services offers individualized appointments to help students work through personal struggles that may be impacting their academic performance.
<https://www.uoguelph.ca/counselling/>
- Student Health Services is located on campus and is available to provide medical attention. <https://www.uoguelph.ca/studenthealthservices/clinic>
- For support related to stress and anxiety, besides Health Services and Counselling Services, Kathy Somers runs training workshops and one-on-one sessions related to stress management and high performance situations.
<http://www.selfregulationskills.ca/>

8.4 Personal information

Personal information is collected under the authority of the University of Guelph Act (1964), and in accordance with Ontario's Freedom of Information and Protection of Privacy Act (FIPPA) <http://www.e-laws.gov.on.ca/index.html>. This information is used by University officials in order to carry out their authorized academic and administrative responsibilities and also to establish a relationship for alumni and development purposes.

For more information regarding the Collection, Use and Disclosure of Personal Information policies please see the Undergraduate Calendar.
(<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/intro/index.shtml>)

8.5 Course Offering Information Disclaimer

Please note that course delivery format (face-to-face vs online) is subject to change up to the first-class day depending on requirements placed on the University and its employees by public health bodies, and local, provincial and federal governments. Any changes to course format prior to the first class will be posted on WebAdvisor/Student Planning as they become available.

9 University Statements

9.1 Email Communication

As per university regulations, all students are required to check their e-mail account regularly: e-mail is the official route of communication between the University and its students.

9.2 When You Cannot Meet a Course Requirement

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. The grounds for Academic Consideration are detailed in the Undergraduate and Graduate Calendars.

Undergraduate Calendar - Academic Consideration and Appeals

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml>

Graduate Calendar - Grounds for Academic Consideration

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml>

Associate Diploma Calendar - Academic Consideration, Appeals and Petitions

<https://www.uoguelph.ca/registrar/calendars/diploma/current/index.shtml>

9.3 Drop Date

Students will have until the last day of classes to drop courses without academic penalty. The deadline to drop two-semester courses will be the last day of classes in the second semester. This applies to all students (undergraduate, graduate and diploma) except for Doctor of Veterinary Medicine and Associate Diploma in Veterinary Technology (conventional and alternative delivery) students. The regulations and procedures for course registration are available in their respective Academic Calendars.

Undergraduate Calendar - Dropping Courses

<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml>

Graduate Calendar - Registration Changes

<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/genreg-reg-regchg.shtml>

Associate Diploma Calendar - Dropping Courses

<https://www.uoguelph.ca/registrar/calendars/diploma/current/c08/c08-drop.shtml>

9.4 Copies of Out-of-class Assignments

Keep paper and/or other reliable back-up copies of all out-of-class assignments: you may be asked to resubmit work at any time.

9.5 Accessibility

The University promotes the full participation of students who experience disabilities in their academic programs. To that end, the provision of academic accommodation is a shared responsibility between the University and the student.

When accommodations are needed, the student is required to first register with Student Accessibility Services (SAS). Documentation to substantiate the existence of a disability is required; however, interim accommodations may be possible while that process is underway.

Accommodations are available for both permanent and temporary disabilities. It should be noted that common illnesses such as a cold or the flu do not constitute a disability.

Use of the SAS Exam Centre requires students to make a booking at least 14 days in advance, and no later than November 1 (fall), March 1 (winter) or July 1 (summer). Similarly, new or changed accommodations for online quizzes, tests and exams must be approved at least a week ahead of time.

For Guelph students, information can be found on the SAS website
<https://www.uoguelph.ca/sas>

For Ridgetown students, information can be found on the Ridgetown SAS website
<https://www.ridgetownc.com/services/accessibilityservices.cfm>

9.6 Academic Integrity

The University of Guelph is committed to upholding the highest standards of academic integrity, and it is the responsibility of all members of the University community-faculty, staff, and students-to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff, and students have the responsibility of supporting an environment that encourages academic integrity. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

Undergraduate Calendar - Academic Misconduct
<https://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml>

Graduate Calendar - Academic Misconduct
<https://www.uoguelph.ca/registrar/calendars/graduate/current/genreg/index.shtml>

9.7 Recording of Materials

Presentations that are made in relation to course work - including lectures - cannot be recorded or copied without the permission of the presenter, whether the instructor, a student, or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

9.8 Resources

The Academic Calendars are the source of information about the University of Guelph's procedures, policies, and regulations that apply to undergraduate, graduate, and diploma programs.

Academic Calendars
<https://www.uoguelph.ca/academics/calendars>

9.9 Disclaimer

Please note that the ongoing COVID-19 pandemic may necessitate a revision of the format of course offerings, changes in classroom protocols, and academic schedules. Any such changes will be announced via CourseLink and/or class email.

This includes on-campus scheduling during the semester, mid-terms and final examination schedules. All University-wide decisions will be posted on the COVID-19 website (<https://news.uoguelph.ca/2019-novel-coronavirus-information/>) and circulated by email.

9.10 Illness

Medical notes will not normally be required for singular instances of academic consideration, although students may be required to provide supporting documentation for multiple missed assessments or when involving a large part of a course (e.g.. final exam or major assignment).

9.11 Covid-19 Safety Protocols

For information on current safety protocols, follow these links:

- <https://news.uoguelph.ca/return-to-campus/how-u-of-g-is-preparing-for-your-safe-return/>
- <https://news.uoguelph.ca/return-to-campus/spaces/#ClassroomSpaces>

Please note, these guidelines may be updated as required in response to evolving University, Public Health or government directives.
