

Department of Biology Course Outline

BIOL 3120 Immunobiology (Fall 2024)

Course description: *In this course, learners will understand the key components of the immune system, including the exploration of the differences and interplay of the innate and adaptive immune system and their responses as it relates to human health and disease. They will also explore immune-related disorders, vaccines and immunotherapies and related methods and technologies.*

Prerequisites (strictly enforced)

SC/BIOL 2020 3.0 and SC/BIOL 2021 3.0, SC/BIOL 2040 3.0, and SC/BIOL 2070 3.0

Instructor(s) and Contact Information

Dr. Mayoorey Murugathasan
Personal Pronouns: (she/her/hers)
Email: mayo994@yorku.ca

Class email:
bio3120@yorku.ca

Course TAs:
Bhatt, Parashr
Hadi, Rawan
Ridany, Ibrahim
Patel, Srishti

Schedule

Mon, wed, 4.00 pm – 5:30 pm

lecture hours weekly, 3 credits

Room No: VH A

Office hours/student hours- Virtual (Thursday 11.00- 12.30 pm)

Zoom link: <https://yorku.zoom.us/j/91056574368?pwd=PKUwhuR034BYcDctjZcHjqOLVHxJnR.1>

Lectures are in-person; however, if you wish to join the lecture virtually, please visit eclass; you will find the Zoom link to join the lecture virtually.

Land Acknowledgement: *We recognize that many Indigenous Nations have longstanding relationships with the territories upon which York University campuses are located that precede the establishment of York University. York University acknowledges its presence on the*

traditional territory of many Indigenous Nations. The area known as Tkaronto has been care taken by the Anishinabek Nation, the Haudenosaunee Confederacy, and the Huron-Wendat. It is now home to many First Nation, Inuit and Métis communities. We acknowledge the current treaty holders, the Mississaugas of the Credit First Nation. This territory is subject of the Dish with One Spoon Wampum Belt Covenant, an agreement to peaceably share and care for the Great Lakes region.

Course learning outcome

Upon successful completion of this course student will develop a comprehensive understanding on:

- **The key components of the immune system and their distribution**
- **Functions and functional outcomes of both innate and adaptive immune system**
- **Immune system's role in various diseases & pathologies**
- **Vaccines, vaccine development, immune related disorders and immunotherapies**

Community guidelines/ agreement

Honesty, inclusive mindset, respect, responsibility, trust, support, understanding, open to different opinions and ideas, Academic Honesty and Integrity

Assessments

Midterm test 1 (Module 1) 20% (In person: Location TBA Time: Class time Oct 9th)
Midterm test 2 (Module 2) 20% (In person: Location TBA Time: Class time Nov 4th)
Online weekly quiz (post-class revision) 10%
Post-class feedback & reflection (every post class) Bonus marks and Gen AI component (0 - 5% TBA) (Online)
Final online integrative case study exam 30%
EE component: **Create** a poster presentation slide for the chosen topic 20% (Due Nov 20, 2024)

Experiential education component:

Create a poster presentation slide for the chosen topic 20% (Due Nov 20, 2024)

Resources

Day1Digital Ebook (D1D)

This course is participating in York University's Day1Digital Ebook Program. You to get instant digital access to the most affordable version of your textbook, billed directly to your York University Student Account.

Please visit eclass to access the ebook:

Website (eClass): <https://eclass.yorku.ca/>

Assistance for Students (Academic and Well-Being)

Academic Advising*: <https://www.yorku.ca/science/academic-advising/> * Departments also offer program specific advising. Check with your Department's Undergraduate Office.

Centre for Human Rights, Equity, and Inclusion: <https://rights.info.yorku.ca>

Centre for Indigenous Students Services: <https://aboriginal.info.yorku.ca/>

Good2Talk 24-hour Ontario Student Helpline: 1-866-925-5454 /Text: GOOD2TALKON to 686868

Keep.meSAFE: <https://myssp.app/keepmesafe/ca/home>

Learning Commons (general academic learning supports including library research, time management, study skills, career planning, etc.): <https://learningcommons.yorku.ca/>

Peer Assisted Study Sessions (PASS): <https://www.yorku.ca/colleges/bethune/get-help/pass/>

Peer Tutoring: <https://www.yorku.ca/colleges/bethune/get-help/peer-tutoring/>

Sexual Violence Response and Support: <https://thecentre.yorku.ca>

Student Counselling, Health & Well-being: <https://counselling.students.yorku.ca/>

Support Services for International Students: <https://yorkinternational.yorku.ca/international-studentsupport/>

Writing Services: <https://www.yorku.ca/colleges/bethune/get-help/writing/>

York University Student Services: <https://family.yorku.ca/student-services/#SCD>

York University Student Well-being Resources: <https://www.yorku.ca/well-being/resources/students/>

Course Content

See the detailed course vision document in eclass for more information on every week / module objective and activities (Adjustment may be made to weekly topics as the course progress)

Module 1: Immune system introduction, components and their development and distribution

Week 1 –7

- Cellular and secreted components, Lymphoid tissues, their functions and anatomy
- Molecular components and their roles (Structure of the antibodies, T cell B cell receptors, T cell B cell receptor diversity generation, innate immune cell receptors, complement system, MHC complex, etc.
- Antigen processing and presentation
- T cell, B cell development

Midterm exam 1

Module 2. More detail view on the functions and functional outcomes of the two arms of us immune system (Innate and adaptive)

Week 8-10

- Innate vs adaptive immune responses
- How the cellular components, lymphoid tissues and secreted components play roles in these two system responses.
 - Inflammation, B and T cell activation and responses
- Their roles/ responses to infections, tissue damage (such as myocardial infections), and some pathologies
- Immune memory

Midterm exam 2

Module 3: Immune memory, Vaccines, Vaccine developments

Week 11-12

- How the immune memory is formed.
- Vaccines, how do they work, their components
- Different types of vaccines- their mechanisms and adv and dis adv.
- Vaccine developments processes
- Various online resources related to infectious diseases, and other chronic diseases

Week 12 Day 2: Experiential education component (*See course vision document & the separate instructions for the assignment and resources*)

Module 4: Immune disorders, Immunotherapies, Introduction to research methods

Week 13

- Immune related disorders, hypersensitivity, allergies, autoimmunity
- Immunotherapies
- Introduction to research methods

Week 14 (Dec 2) Final online integrative case study exam

Experiential Education and E-Learning

Class Online Quiz

Class discussions on real life situations

Create a poster presentation for the chosen topic 20% (Due Nov 20, 2024)

Course Policies

Missed midterm *there is no make-up test – weight will be transferred to final exam (e.g. If you miss one midterm final will be worth 50%).*

For a missed midterm an “Attending Physician’s Statement” will need to be completed by a Physician and handed in to me or a grade of zero will be awarded.

Late submission *of EE assignment component– for late submissions, there will be a (%TBA) deduction for each day past the set deadline date. (Due Nov 20, 2024)*

Missed final exam, *you will need to formally email the course instructor within one week of missed exam to write a deferred exam. Note, the questions on the deferred final exam will be different from the regular exam and the format of the deferred final exam could also be different. It could also be an in-person exam like a midterm. You MUST formally contact the course director to request a deferred standing using this form*

<https://secure.students.yorku.ca/pdf/final-exam-assignment-deferred-standing-agreement.pdf>

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 http://www.registrar.yorku.ca/pdf/exam_accommodation.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/>