



Course Instructor

Dr. Fraser Soares:
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Office Hours

Fridays 2:30-3:30pm (EST) via Blackboard Collaborate

Course Coordinator

Jennifer Campbell: jac.campbell@utoronto.ca

Lectures

Pre-recorded and posted on Quercus weekly before noon on Fridays.

However, you must be available for the lecture (12pm - 2pm EST) on March 5th for the midterm. Having a conflict with another class is NOT a valid reason

Textbook

Immune System, 4th Edition (ISBN: 9780815345268)
By Parham, Peter (Published by Garland)

Students are able to view and purchase their required course materials by course code here;
https://uoftbookstore.com/buy_textbooks.asp?

E-book version of the text: <https://uoftbookstore.vitalsource.com/textbooks?term=9781317511571>

Course Description

This course introduces the molecular and cellular basis of the immune system. Topics include self versus non-self recognition, humoral and cell-mediated immune responses, and the structure and function of antibodies. The importance of the immune system in health and disease will be emphasized and topics include vaccination, autoimmunity, and tumour immunology.

Course Learning Outcomes

By the end of this course, students will be able to:

- Describe components of the immune system and their roles in immunity
- Explain processes that result in the elimination of pathogens (e.g., opsonization, neutralization, complement activation, etc.).
- Distinguish the functional capacity of cell types in the immune system – a focus on lymphocytic development and differentiation into generating antigen receptors (e.g., BCRs and TCRs).
- Predict immune responses required to defend the body.
- Identify underlying immune defects that may result in immunodeficiency diseases, autoimmune diseases, allergies and tumor immune evasion.
- Evaluate experimental approaches in immunology such as flow cytometry, enzyme-linked immunosorbent assay, adoptive transfer of immune cells, antibody production/purification, knockout/transgenic mice models, gene expression profiling and vaccine development.

Course Prerequisites

BIOB11H3 or (BIOB10Y3)

Exclusions: IMM340H, IMM350H

Evaluation Scheme & Course Assessments

Marking Scheme A

Assessment	% of Grade	Description
Weekly Quizzes	6	Online Weekly Quizzes – Lectures 1-11
Assignment	10	Part 1 due Feb 12 th Part 2 due March 12 th Part 3 due March 26 th
Midterm	39	Lectures 1-6: content and research articles (March 5 th)
Final Exam	45	Lectures 1-12: content and research articles (TDB)

Marking Scheme B (optional)

Assessment	% of Grade	Description
Weekly Quizzes	6	Online Weekly Quizzes – Lectures 1-11
Assignment	10	Part 1 due Feb 12 th Part 2 due March 12 th Part 3 due March 26 th
Optional Assignment	14	Part 1 due Feb 26 th Part 2 due April 1 st
Midterm	30	Lectures 1-6: content and research articles (March 5 th)
Final Exam	40	Lectures 1-12: content and research articles (TDB)

Quizzes (6%)

Online quizzes will be administered through Quercus following each lecture. Students will only have ONE attempt to complete each quiz. Quizzes will be available on Quercus following the lecture at 2pm (EST) on Fridays and can only be accessed until the following Thursday until 11:59pm (EST). Details will be discussed during the first lecture. If the quiz is NOT submitted by the due date, you will receive zero.

Assignment (10%)

Group assignment (4-5 per group) – the goal is to connect lecture content with scientific literature by analyzing primary research articles and summarizing the main findings in a written and visual manner. Further details on the rubric will be provided during the first lecture on January 15th. The assignment will consist of three parts and will be submitted through Quercus. Details will be discussed during the first lecture and also posted on Quercus under Assignment.

Reading Groups	Lecture Reading Article
Reading Set A	1, 5, 9
Reading Set B	2, 4, 8
Reading Set C	3, 6, 7

Due Dates:

Part 1 – Lectures 1-3: Due February 12th at 12pm (EST) – 3% of Final grade

Part 2 – Lectures 4-6: Due March 12th at 12pm (EST) – 3% of Final grade

Part 3A – Lectures 7-9: Due March 26th at 12pm (EST) – 3% of Final grade

Part 3B – Group member evaluation and reflection: Due April 2nd at 12pm (EST) – 1% of Final grade

If the assignment is NOT submitted by 12pm (EST) on the due date, you will receive zero.

Optional Assignment (14%)

- This is a group assignment – groups must consist of 4-5 people.
- You must OPT-IN to this assignment by signing up your group on Quercus by **February 5th**, no exceptions.
- Once you OPT-IN you CANNOT later opt-out. If you opt-in and do not submit an assignment, you will receive a grade of zero.
- Assignment deadlines: **Feb 26th and April 1st** (see assignment posting for additional deadlines)
- No extensions permitted. Late assignments will be penalized 10% per day. Assignments will not be accepted 5 days after the deadline.
- Electronic copies of the assignment must be submitted via Quercus.
- All questions related to the assignment should be directed to the course email: **bio39assignment@gmail.com** with subject line: **Optional Assignment**
- A more detailed description of the assignment will be discussed during the first lecture on January 15th and also posted on Quercus. Please refer to assignment posting for full details and deadlines.

Midterm

Midterm will be held during online class time (12 – 2pm EST) on March 5th. **Having a conflict with another class is NOT a valid reason to miss the midterm.** The midterm will cover content and research articles from lectures 1-6.

Final Exam

The final exam will cover content and research articles from all lecture topics.

BIOC90 Integrative Multimedia Documentary Project

This course is one of several that can be used to fulfill the BIOC90 program requirement that all students in Biological Science specialist and major programs need to complete before graduation. If you decide to enroll in BIOC90 this semester, you can do so through Acorn – you will need to enroll before the course add/drop date. Please note that if you are enrolled in more than one of the C-level courses that can be used to fulfill this program, you will need to decide which course you want the 10% grade for BIOC90 applied to (you can only apply this grade to ONE of the participating C-levels).

Please see <https://www.utoronto.ca/biosci/biob90h3-bioc90h3> for a list of participating courses. It is your decision as to when you will complete BIOC90 (you do not need to do so this semester, but you do need to complete this course to graduate if you are enrolled in the most recent versions of our programs). If you end up taking BIOC90 at a time when you are not enrolled in any of the participating classes, you cannot benefit from the assignment grade in any way. If you are not sure if you need to take BIOC90 to complete your program, please consult degree explorer – it will show up there as a program requirement if it is something you need to complete. Note: even if it is not one of your program requirements, you can still choose to complete this course if you wish to do so.

Under the 'BIOC90 Module' on our Quercus Page, the C90 Course Instructor will post all the information you will need to help you decide whether you want to take BIOC90 this term. Here, you will be able to find (i) the C90 course syllabus, as well as (ii) an information session held by the course instructor covering the details of the project.

Course Communications

Content-related questions should be asked during a scheduled office hour appointment, or on the class discussion board on Quercus. No content-related questions will be answered over email or on the discussion board. For help with Quercus specifically, please contact student_helpdesk@utsc.utoronto.ca or visit <https://www.utoronto.ca/projects/quercus/student-help/>.

Email messages must include in the subject line the course identifier and a concise and clear statement of purpose (e.g. BIOC39H: appointment); the body should contain your full name and student number and all emails MUST be sent from your UTORONTO email address. Emails from all other addresses will not be responded to. Legitimate email inquiries will receive a reply within 48hrs (in most instances) during the workweek (does NOT apply to weekends). Email should NOT be used as an alternative to office hours.

Accessibility Accommodations

Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability/health consideration that may require accommodations, please feel free to approach me and/or the AccessAbility Services Office as soon as possible.

AccessAbility Services staff (located in Rm AA142, Arts and Administration Building) are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations 416-287-7560 or email ability@utsc.utoronto.ca. The sooner you let us know your needs the quicker we can assist you in achieving your learning goals in this course.

Academic Integrity

The University treats cases of cheating and plagiarism very seriously. The University of Toronto's Code of Behaviour on Academic Matters (<https://governingcouncil.utoronto.ca/secretariat/policies/code-behaviour-academic-matters-july-1-2019>) outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences.

Potential offences in papers, exams and assignments include using someone else's ideas or words without appropriate acknowledgement, submitting your own work in more than one course without the permission of the instructor, making up sources or facts, obtaining or providing unauthorized assistance on any assignment.

On tests and exams cheating includes using someone else's ideas or words without appropriate acknowledgement, using or possessing unauthorized aids (textbooks, online material), looking at someone else's answers during an exam or test (taking/sharing a picture or screenshot or discussing questions/answers), misrepresenting your identity, or falsifying or altering any documentation required by the University, including (but not limited to) doctor's notes.

Turnitin

Normally, students will be required to submit their course essays to Turnitin.com for a review of textual similarity and detection of possible plagiarism. In doing so, students will allow their essays to be included as source documents in the Turnitin.com reference database, where they will be used solely for the purpose of detecting plagiarism. The terms that apply to the University's use of the Turnitin.com service are described on the Turnitin.com web site. **Turnitin will be used for your assignments and exam answers to detect any plagiarism.**

Recording Lectures and Sharing Notes

Students are permitted to use the recorded lectures for personal use. **Students are instructed to not upload the recordings to a shared drive or folder or hosted on a video service platform such as YouTube or Facebook messenger.** Students are reminded that lectures are the intellectual property of the instructors, and the recordings should be respected thus. Students are further reminded that the Academic Handbook states: "It is absolutely forbidden for a student to publish an instructor's notes to a website or sell them" (section 4.5)" Any student found violating this rule will be brought into the Office of Student Academic Integrity.

Missed Test Policies

Advance conflict: If you know in advance that you cannot write the midterm at the scheduled time because it conflicts with some other valid activity, please notify the course instructor as soon as possible so that can try and make arrangements for you to write the tests. If an arrangement cannot be made, it will count as a missed test.

Medical illness: If you miss a test you must provide the UTSC Verification of Illness Form within 3 days of the term test to Jennifer Campbell (jac.campbell@utoronto.ca) Course Coordinator in Biological Sciences. You must see a doctor on the day of the test, notes that are dated before the test or after the test are will not be accepted. The UTSC Verification of Illness Form can be found here: http://www.uts.utoronto.ca/~registrar/resources/pdf_general/UTSCmedicalcertificate.pdf

Other valid reasons: If you miss the tests/midterm for any other valid reason, please consult with the Course Coordinator (Jennifer Campbell) as soon as possible. The Course Coordinator will determine whether the reason given for the missed term tests is valid in accordance with university policies. Also, the Course Coordinator may ask for any documentation required to verify the reason given.

Invalid reasons: Students who miss the midterm/tests for any invalid reason will receive a grade of zero. Having a class conflict is an invalid reason.

Make-up midterm: There will be one single make-up midterm only for those who have **missed with a valid reason**. The make-up midterm may differ in format than the original midterm. Missing the make-up midterm will result in transfer of all midterm exam grades onto the final exam weighting.

**Disclaimer: The above schedule, policies, procedures, and assignments in this course are subject to change in the event of extenuating circumstances.

Submission of Assignments

All written assignments should be submitted **electronically** via Quercus by the due date.

Penalty for Late Assignments

Late submissions of ALL assignments are subject to a late penalty of 10% per day, with no late assignments allowed after **5 calendar days**. For example, if your essay receives a grade of 85, and it was two days late, with a 10% late penalty per day, your final grade is 65. No extensions permitted.

Marking Concerns with Assignments

Any requests to have an assignment re-graded must be made in writing **within one week** of the date the marks were posted on Quercus. To be considered, your message **must** clearly identify your concern, contain a detailed justification for your concern and make specific references to the relevant course material. Keep in mind that it is possible for your assignment grade to go down if the re-graded mark is lower than your original assignment grade.

Health and Wellness

The university experience can be a challenging one, there is no need to go about it alone. If you or anyone you know could use someone to talk to (or text with), here are some resources in addition to your instructors, program coordinators, and TAs:

- Your **college registrar** and **office of residence of student life (ORSL)**
- **MySSP** [24/7, talk in 146 languages & text in 35 languages]: available on Apple App Store and Google Play Store.

- **Good 2 Talk Student Helpline** [24/7]: 1-866-925-5454
- **Gerstein Centre** [24/7]: 416-929-5200

Tentative Class Schedule

The tentative schedule for the course is shown below. Some adjustments may be made as the course progresses. Research articles are accessible through the 'Library Course Reserves' section on Quercus.

Date	Lecture Topic	Textbook Chapter	Page	Research Article (Reading Set)
Jan 15	Lecture 1 Introduction to Immunology	1.1 – 1.6	pg. 1 – 12	PMID: 33033173 (A)
Jan 22	Lecture 2 Cells and Tissues of the Hematopoietic System	1.7 – 1.14	pg. 12 - 26	PMID: 22406534 (B)
Jan 29	Lecture 3 Innate Immunity Assignment – Group signup deadline at 6pm (EST)	2, 3.1 – 3.5, 3.7 – 3.13, 3.15, 3.17, 3.19 – 3.20	pg. 29 – 44, 47 – 55, 56 – 67, 68 – 70, 71 – 72, 73–76	PMID: 29746835 (C)
Feb 5	Lecture 4 Antibody Structure & Ig diversity Optional Assignment OPT-IN deadline at 6pm (EST)	4.1 – 4.9	pg. 81 – 96	PMID: 29520062 (B)
Feb 12	Lecture 5 B cell development & activation Assignment – Part 1 due at 12pm (EST)	6.1 – 6.8, 6.10 – 6.14 9.1 – 9.10	pg. 149 – 160, 161 – 168, 231 - 244	PMID: 30120235 (A)
Feb 19	Reading week			
Feb 26	Lecture 6 Antibody effector functions Optional Assign. – Part 1 due at 6pm (EST)	9.11 – 9.24	pg. 245 – 264	PMID: 30612739 (C)
Mar 5	Lecture 7 Antigen Recognition by T cells Midterm 12- 2pm (EST)	5.1 – 5.22	pg. 113 – 142	PMID: 30700903 (C)
Mar 12	Lecture 8 T cell development & T cell mediated immunity Assignment– Part 2 due at 12pm (EST)	7.1 – 7.13 8.1 – 8.20	pg. 177 – 196 pg. 199 – 228	PMID: 31451788 (B)
Mar 19	Lecture 9 Mucosal Immunology and the Microbiome & Immunological Memory And Vaccination	10.1 – 10.16 11.1 – 11.28	pg. 267 – 291 pg. 295 – 326	PMID: 32582756 (A)
Mar 26	Lecture 10 Immunity to Infection & Failures of the Body's Defences - Assignment – Part 3A due 12pm (EST) - Assignment – Part 3B due April 1st at 12pm (EST) - Optional Assign.– Part 2 due April 1st at 6pm(EST)	13.1 – 13.5, 13.8 – 13.9, 13.11 – 13.12, 13.15, 13.17 – 13.20, 13.22 – 13.25	pg. 365 – 372, 375 – 377, 379 – 381, 383 – 385, 388 – 392, 393 – 398	PMID: 32577634
April 9 (lecture will be released April 2 nd)	Lecture 11 Allergy & Autoimmunity	14.1 – 14.6, 14.8 – 14.10, 14.13, 14.15 - 14.21, 16.1 – 16.6 16.12 – 16.14, 16.16 – 16.19	pg. 401 – 407, 409 – 413, 416 – 418, 419 – 429, 474 – 484, 492 – 496, 498 - 505	PMID: 31176558
April 12 (lecture will be released April 9 th)	Lecture 12 Transplantation Immunology & Tumor Immunology	15.1 – 15.26 17.1-17.12	pg. 434 – 468 pg. 509–530	PMID: 28504668