YORK UNIVERSITY
FACULTY OF HEALTH
KINESIOLOGY AND HEALTH SCIENCE

Course: KINE3710 3.0 – Immune System in Health and Disease
Course Webpage: eClass
Term: Fall 2022
Prerequisite / Co-requisite: HH/KINE 2011 3.00; HH/KINE 3012 3.00.
Course Credit Exclusion: None. **Note**: May not be taken for credit by Biology or Biochemistry majors.

COURSE DIRECTOR: Mayoorey Murugathasan

Instructor: Mayoorey Murugathasan
Location: Tuesday CLH M,
Thursday CLH H
Virtual Office hours: Tuesdays and Thursdays from 1 pm – 2 pm
https://yorku.zoom.us/j/96734550696?pwd=VlFZRExValUwblNkcHhqekFoeXNaZz09

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Email inquiries are welcome, but only emails sent from your **york.ca** account will be answered. Students must indicate their **full name, student number and KINE3710 in the subject line**. Emails not respecting these guidelines will NOT be answered.

TIME AND LOCATION

Lectures: Tuesdays and Thursdays, 10:30 AM – 12:00 PM (Start date: September 7, 2022)
Location: Lectures **will be in person in CLH M, H** (*plans for in-person lectures may change according to public health and York University guidelines)*

COURSE DESCRIPTION

The immune system in health and disease is designed to provide students with an overview of the two main arms of the immune system including innate and adaptive immunity. Additionally, the course will cover the various cellular components and the effector molecules of the immune system. The course ends with a brief update on the research regarding the effects of physical activity on immune responses.

COURSE ORGANIZATION

There are **two** **90-minute lectures a week,** where the core concepts of the course will be explained and clarified. Active learning techniques will be implemented, and student participation is expected. There are no required laboratories. It is expected that each student will review the material to be presented in the class *before the class.* **The lectures will be delivered in person in CLH M and H.** (*plans for in-person lectures may change according to public health and York University guidelines)*

LEARNING OBJECTIVES

The main objective of this course is to enable students to understand the fundamental biology of the innate and the adaptive immune responses. Upon completion of this course, students should be able to:/

- Identify the cells and tissues of the immune system and understand their place and purpose within the human body.
- Describe and characterize the components of the innate and adaptive immune systems and explain how these components are organized to form an immune response.
- Describe and compare the development of B cells and T cells, including the gene rearrangements that generate the antigen receptors and the selective processes that eliminate cells with potential for causing autoimmunity.
- Understand how cellular and humoral immunity work, and the development of immunological memory. This will help students understand the importance of vaccines and how they work.
- Explain the diseases associated when the immune system mounts unwanted or unnecessary responses.

COURSE TEXT / READINGS

Required Textbook: Basic Immunology: Functions and Disorders of the Immune System, SIXTH EDITION, by Abul Abbas – ELSEVIER. The textbook is available at York U Bookstore (https://www.bookstore.yorku.ca/buy_book_detail.asp?pf_id=13736057)
Lecture Slides: Slides are uploaded to eClass but might be modified and updated prior to each lecture. **These slides are copyrighted and cannot be shared in any way.**

VIRTUAL INDIVIDUAL OFFICE HOURS

Individual office hours are used to address any questions regarding the course material.

Individual office hours are held via Zoom on **Tuesdays and Thursdays from 1 to 2 pm**. Students who click the Zoom link for virtual office hours will be automatically placed in a waiting room. Students will then be selected into the one-on-one virtual meeting with Mayoorey on a first come, first serve basis.
Please note that individual office hours will be recorded for quality purposes and will not be shared with the class.

EVALUATION SUMMARY

1. **Online quizzes (eClass):** 10%, Weekly online quizzes (10 in total: 1 quiz on course outline + 9 on Thursdays of weeks 1, 2, 3, 5, 6, 8, 10, 11 and 12; see lecture overview) will be conducted on eClass and will be worth 1% each. Quiz format varies and may include short answer question, matching, fill-ins and multiple-choice questions.
   Note: *The quiz on course outline will be available starting from Jan 10 until Jan 31.*

2. **EXAM 1:** 25% (45 multiple-choice questions), covers the lectures 1 - 7
   Date: **Tuesday, Oct 4, 2022**, 10:30 – 11:30 AM
   Location: **TBA**

3. **Term Paper:** 15% (see below for full detail and grading rubric), **Due on Dec 12nd, 2022 at 11.59 pm.**

4. **EXAM 2:** 25% (45 multiple-choice questions), covers the lectures 8 - 14
   Date: **Tuesday, Nov8, 2022**, 10:30 – 11:30 AM
   Location: **TBA**

5. **EXAM 3:** 25% (45 multiple-choice questions), covers the lectures 15 – 21
   Date: **Tuesday, Dec6, 2022**, 10:30 – 11:30 AM
   Location: **TBA**

TERM PAPER

As part of the evaluation, a term paper must be submitted to eClass by December 12, 2022 at 11.59 pm.

Summary:

We are in the midst of an unprecedented pandemic in human history, where a virus, SARS-Cov-2 that causes COVID-19, continues to spread and infect people of all age groups and causing serious disease and numerous deaths. Over the past two years, several vaccines have been approved by FDA under emergency use.

Given what you have learned about vaccines in the first part of the course (i.e. lecture 18), write a paper that details

- how do vaccines work? Different covid vaccines and their types?
- Your perspectives on efficacy and safety on the above covid vaccine types?
- In the last paragraph of the assignment, write a concise and convincing discussion on vaccine safety and advantages to the public.

The purpose of this term paper is **not to** summarize the current literature on this topic, but instead to get a sense of your **own understanding** of vaccines of COVID-19. You only need to cover what we discussed in lectures, specially lecture 18.

Here are key requirements regarding the paper:

Permitted resources: Books, online scientific journals.

The following aspects of your paper will be evaluated:

1. **Title (5 marks)** – Should be original and captivating

2. **Content (35 marks)** – Your paper should cover all the knowledge we covered in the lectures related to vaccine responses. Make sure the content is specific and objective.
3. **Perspective and last paragraph on vaccine safety and advantage (35 marks)** – Staying in the context of Vaccine responses, add your own perspective and ideas as to why you think one vaccine may be safer or effective than others.
4. **Accuracy of information (15 marks)**
5. **Format, Grammar and spelling (10 marks)** - The paper must be 2 pages long and single-spaced. Font: 12 pt Times New Roman. One-inch margins.

Submission:

The paper must be submitted via eClass into the "Term Paper" section. Submission window will open on November 22, 2022, at 11.59 PM and **close on December 12, 2022 at 11.59 PM**. The deadline for the submission of the assignment is firm. You can submit your paper any time during the submission window. No extensions or exceptions will be granted. In fact, the sooner you complete it the better because this way you do not miss the deadline in case any unforeseen situation or technical difficulties occur the day the assignment is due. A late submission will not be accepted, and the student will receive a 0 (zero) for the assignment. Only submission to eClass's "Term paper" section will be accepted.

Avoiding plagiarism:

Your term paper will be subject to "Turnitin" originality check software. The instructor will perform the originality check whereas the TA will grade your paper.

It is NOT acceptable to copy & paste or plagiarize information from source material into your term paper.
This is plagiarism. Your paper must be **IN YOUR OWN WORDS**.

To promote academic integrity in this course, students will be normally required to submit their written assignments to Turnitin (via the course Moodle) for a review of textual similarity and the detection of possible plagiarism. In so doing, students will allow their material to be included as source documents in the Turnitin.com reference database, where they will be used only for the purpose of detecting plagiarism. The terms that apply to the University's use of the Turnitin service are described on the Turnitin.com website.

If your paper is tagged by turnitin with a high similarity score (a high similarity score is anything above 20%), you will be given the chance to look at the similarity report generated by Turnitin and talk to us. After this step, the report will be sent to the Academic Integrity Office that will start an investigation on the incident.

MISSED TERM TEST POLICY

Students with a valid reason for missing a course test, such as illness, compassionate grounds, etc., may request accommodation from the Course Director via email **within one week from the exam date.** Otherwise, a grade of "0" will be assigned for the test.

Students with **valid excuses (see below)** to miss **ONLY ONE** exam will have to write the missed exam in **January 2023**, which will cover only the lectures for the missed evaluation.

Students with valid excuses who miss **more than one exam** will have to write a **cumulative exam** in **January 2023** that covers all lectures and not only those reflecting the evaluations they

have missed. This exam would be worth the weight of all missed exams and consists of 100 questions (multiple choice, short answer, matching).

To be able to write the missed evaluations in January (see above), students must request deferred standing. To request deferred standing, the student must complete and submit a Deferred Standing Agreement Form (see http://myacademicrecord.students.yorku.ca/pdf/deferred_standing_agreement.pdf) and submit it to the course director **before the deadline on Thursday Dec 13, 2022 at 12 pm.** The exact date and time of the exam will be announced in early January 2023. Students who have been granted deferred standing and do not complete the make-up examination must petition to the Office of the Registrar. **There will be no deferred-deferred exam.**
Under no circumstances will accommodations be provided because of conflict with vacation plans or work conflicts.

COURSE POLICIES AND TECHINICAL REQUIREMENTS

- In addition to in person-lectures the two main online platforms used in this course will be **eClass (Formerly Moodle) and Zoom** through which students will interact with the course director, view course materials and write assignments/quizzes. Students shall note the following:
  - Zoom is hosted on servers in the U.S. This includes recordings done through Zoom.
  - If you have privacy concerns about your data, provide only your first name or a nickname when you join a session.
  - The system is configured in a way that all participants are automatically notified when a session is being recorded. In other words, a session cannot be recorded without you knowing about it.
  - Zoom will be used for synchronous online lectures and virtual office hours. The links for lectures and office hours are available in this outline and on the course page on eClass.
  - Lecture recordings will be posted on eClass after each lecture. You will find them in the folder "Lecture Recordings" on eClass. You will also have access to the lecture slide decks ahead of time (see below).
  - Students will need an electronic device capable of connecting to Zoom to be able to attend the synchronous lectures. It is the student's responsibility to ensure a stable and preferable fast internet connection.
  - Students will be able to access the Zoom sessions for online lectures and office hours only if they **sign in using their Passport York credentials**.

- Numerous students in Faculty of Health courses have been charged with academic misconduct when materials they uploaded to third party repository sites (e.g. Course Hero, One Class, Chegg, etc.) were taken and used by unknown students in later offerings of the course. The Faculty's Committee on Examinations and Academic Standards (CEAS) found in these cases that the burden of proof in a charge of aiding and abetting had been met, since the uploading students had been found in all cases to be wilfully blind to the reasonable likelihood of supporting plagiarism in this manner. Accordingly, to avoid this risk, students are urged not to upload their work to these sites. Whenever a student submits work obtained through Course Hero, Chegg or One Class, the submitting student will be charged with plagiarism and the uploading student will be charged with aiding and abetting.

- Note also that exams, tests, and other assignments are the copyrighted works of the professor assigning them, whether copyright is overtly claimed or not (i.e. whether the © is used or not). Taking photos or screenshots of these questions constitutes copying, which is a breach of Canadian copyright law, and the breach is aggravated when photos are shared or uploaded to third party repository sites.

- Students are required to make themselves aware of school policies relating to Academic Honesty and Integrity, Access, Religious Accommodation, Student Conduct and other matters. Plagiarism and other academic offenses will be sanctioned to the fullest extent in accordance with university and Faculty policies.

A summary of these policies can be accessed at http://www.yorku.ca/secretariat/senate/committees/ascp/documents/CourseInformationForStudentsAugust2012.pdf

The following is a list of requirements of what you will need in order to complete the course.

- Useful links to computing information, resources and help for students:

Student Guide to Moodle	https://lthelp.yorku.ca/student-guide-to-moodle
Computing for Students Website	https://student.computing.yorku.ca/
Student Guide to eLearning at York University	http://elearning-guide.apps01.yorku.ca/
Learning Skills Services	https://lss.info.yorku.ca/online-learning/
Zoom@YorkU User Reference Guide	http://staff.computing.yorku.ca/wp-content/uploads/sites/3/2012/02/Zoom@YorkU-User-Reference-Guide.pdf
Zoom@YorkU Best Practices	https://staff.computing.yorku.ca/wp-content/uploads/sites/3/2020/03/Zoom@YorkU-Best-Practicesv2.pdf

LECTURE OVERVIEW

	TOPICS COVERED	LECT	DATE
WEEK 1	Course business / General introduction to the immune system	1	Sept 8
WEEK 2	Types of Adaptive Immunity	2	Sept 13
	Tissues of the immune system	3	Sept 15
WEEK 3	Innate immunity: How to recognize microbes	4	Sept 20
	Components of innate immunity: cells, barriers & complement	5	Sept 22
WEEK 4	Innate immune reactions	6	Sept 27
	Antigen capture and presentation to T cells: MHC molecules	7	Sept 29
EXAM 1	**Location TBA; Time: 10:30 – 11:30 AM; covers lectures 1-7**		**Oct 4**
WEEK 5	Antigen processing and presentation	8	Oct 6
WEEK 6	**Reading Week- No Lectures**		**Oct 8-14**
WEEK 7	B-Cell and T-Cell receptors	9	Oct 18
	Generation of diversity in antigen receptors	10	Oct 20
WEEK 8	Development of B and T cells	11	Oct 25
	Activation of T cells	12	Oct 27
WEEK 9	TCR Signaling	13	Nov 1
	T Cell-dependent immune responses	14	Nov 3
EXAM 2	**Location TBA; Time: 10:30 – 11:30 AM; covers lectures 8-14**		**Nov 8**
WEEK 10	B Cell activation and signaling	15	Nov 10
WEEK 11	Functions of T cells in humoral Immunity	16	Nov 15
	Effector mechanisms of humoral Immunity	17	Nov 17
WEEK 12	Vaccines: How they work and protect from disease	18	Nov 22
	Immunological tolerance and autoimmunity	19	Nov 24
WEEK 13	Cancer and Its Interactions with the Immune System	20	Nov 29
	Immune responses against transplants & Hypersensitivity	21	Dec 1
EXAM 3	**Location TBA; Time: 10:30 – 11:30 AM; covers lectures 15-21**		**Dec 6**

ACADEMIC HONESTY AND INTEGRITY

In this course, we strive to maintain academic integrity to the highest extent possible. Please familiarize yourself with the meaning of academic integrity by completing SPARK's Academic Integrity module at the beginning of the course. Breaches of academic integrity range from cheating (i.e., the improper crediting of another's work, the representation of another's ideas as your own, etc.) to aiding and abetting (helping someone else to cheat). All breaches in this course will be reported to the appropriate university authorities, and can be punishable according to the Senate Policy on Academic Honesty.

To promote academic integrity in this course, students will be normally required to submit their written assignments to Turnitin (via the course eClass site) for a review of textual similarity and the detection of possible plagiarism. In so doing, students will allow their material to be included as source documents in the Turnitin.com reference database, where they will be used only for the purpose of detecting plagiarism. The terms that apply to the University's use of the Turnitin service are described on the Turnitin.com website.

IMPORTANT COURSE INFORMATION FOR STUDENTS

All students are expected to familiarize themselves with the following information, available on the Senate Committee on Academic Standards, Curriculum & Pedagogy webpage (see Reports, Initiatives, Documents) -
http://www.yorku.ca/secretariat/senate_cte_main_pages/ASCP.htm
http://secretariat.info.yorku.ca/files/CourseInformationForStudentsAugust2012.pdf

- Senate Policy on Academic Honesty and the Academic Integrity Website
- Ethics Review Process for research involving human participants
- Course requirement accommodation for students with disabilities, including physical, medical, systemic, learning and psychiatric disabilities
- Student Conduct Standards
- Religious Observance Accommodation

ACCOMMODATIONS

York senate policy on Academic Accommodation for Students with Disabilities: http://www.yorku.ca/secretariat/policies/document.php?document=68 *"York University shall make reasonable and appropriate accommodations and adaptations in order to promote the ability of students with disabilities to fulfill the academic requirements of their programs"* . Students who feel that there are extenuating circumstances that may interfere with the successful completion of their exams or other course requirements are encouraged to discuss their concerns with Dr. Abdul-Sater as soon as possible. Students with learning, mental health, physical, sensory and medical disabilities who require accommodations in teaching style or evaluation methods should discuss the matter with Counselling and Disability Services (CDS - N110 Bennett Centre; http://www.yorku.ca/cds/) and the Course Director (Dr. Abdul-Sater) early in the term so that appropriate arrangements can be made. Please note: you are not required to disclose the nature of your condition. If you are registered with CDS, Dr. Abdul-Sater will work with CDS to ensure all reasonable accommodations are met.

COVID-19 POLICY

Please refer to the following Yorku pages to get updates on the current York COVID-19 updates

https://www.yorku.ca/bettertogether/

https://www.yorku.ca/bettertogether/2022/08/29/get-ready-for-return-to-campus/