IMM250H1F "IMMUNITY AND INFECTION" – FALL 2016

Students will be introduced to the basic concepts of immunity to infectious disease. We will trace the history of current ideas in immunology by examining how bacteria and viruses cause disease and the initial discoveries that led to such developments as vaccination. Current topical and newsworthy infectious diseases (HIV, Ebola, avian flu, Sepsis) will be used as examples of how the immune system copes with microbial infections and how breakdown of the immune response can lead to diseases such as autoimmunity.

IMM250 is a required course for all immunology programs, however it is designed to fulfill breadth requirements and is an appropriate choice for students in other science or humanities programs. Development of writing skills through the composition of a science article for the general public is one objective of this course.

Recommended Preparation: BIO120H, BIO130H

COURSE DATES AND POLICIES

Class time: Tuesdays, 10am-12noon, Location: OISE Auditorium room G162, 252 Bloor Street.

Course coordinator:
Dr. Liliana Clemenza liliana.clemenza@utoronto.ca
All postings (lecture material and announcements) will be done on Blackboard. Please check the Portal regularly.

Lecturers:
Dr. L. Clemenza
Office hours: Mondays 12:30-2:30pm, room MSB 7267. Please email in advance for appointment. Other meeting arrangements can be made upon request.

Dr. Wendy Tamminen w.tamminen@utoronto.ca
Office hours: TBA

Guest Lecturers:
Dr. Tania Watts
Dr. Brian Barber

Evaluation Summary and Event Dates:

1. Midterm Test: **Weight 20%** (multiple-choice questions), it will include the first 4 lectures.
When: **Tuesday October 11 2016, 11am-12noon** (one hour)
Location: Exam Centre, rooms: TBA, 255 McCaul Street.

Last day to drop courses with 'F' section codes: November 7, 2016

2. Assignment - Science & Society Paper: **Weight 20%. Turnitin/Blackboard submission deadline**: **Sunday November 13 2016 at 11.59pm**. Submission is online, no hard copy submission required.

Late papers must be submitted by Sunday November 27. The penalty for late submission is 5% deduction from your term paper mark per day of delay (e.g. if the raw score for your paper is 80 and you submitted two days past the deadline your raw score will be changed to 72)**. No papers will be accepted after Sunday November 27.**

Students with valid reasons for deadline extension must contact their registrar with the appropriate documentation. **Deadline extensions will be granted only following a request submitted by the student's registrar**.

3. Final Exam: **Weight 60%.** Date and location will be announced. The format of the final exam is multiple-choice and cumulative but biased towards the second part of the course.

Deferred Exam
Students who miss the final exam for a valid reason may petition to the Faculty of Arts and Science to write the deferred exam. **The format of the deferred exam is written answer and is cumulative.**

Tutorials:

Science & Society paper Tutorial: TBA
Pre-Final Exam tutorial: TBA

NB: Participation is not mandatory but recommended. The tutorial slides will be posted on blackboard the day after each tutorial takes place.

Missed Term Test Policy
If a term test is missed due to illness, then:
1. The student must obtain the University of Toronto 'Verification of Student Illness or Injury form', have it filled out by their Physician, Surgeon, Nurse Practitioner, Registered Psychologist, or Dentist, and submit it to the Immunology Office (Room 7205, Medical Sciences Building), within one week of the missed exam. Forms

submitted by email will not be accepted.
2. **If** the note confirms that the student was incapacitated on the day of the test, **then** the weighting of the students other graded work (including the final exam) will be increased by the amount of the missed test.
If the note does not confirm that the student was incapacitated on the date of the test, **then** a grade of "0" will be assigned for the test.

THERE ARE NO MAKE UP MID-TERM TESTS

LECTURE OVERVIEW

Date	Lecture	Lecturer
September 13	**Course Business**; **Overview of the immune system**: cells and receptors of innate and adaptive immunity are introduced with an historical perspective	L. Clemenza
September 20	**Innate Immunity: the first line of defense to infection** Types of pathogens; mechanisms of pathogenicity Case study - **Helicobacter pylori, Barry Marshall and his self-induced infection** Phagocytes and other cells of the innate immune system Case study - **Phagocyte disorders: Chronic granulomatous disease** Sensing infection: Pattern recognition receptors and activation of innate cells, role of complement in immune defense, and inflammatory response. Case study - **Septic shock: when the immune response goes out of control**	L. Clemenza
September 27	**Immunology of the gastrointestinal tract - Anatomical and chemical barriers to intruders** Immune function of epithelial cells Keeping microbial growth in check through stratification in the gut lumen: mucus and mucins, defensins, IgA Gut microbiota-immune system crosstalk; Case study - **Losing tolerance to gut microbiota: Crohn's disease** Breaking through the barriers: **Salmonella infection**	L. Clemenza

October 4	**Tolerance to food proteins and food allergy** Mechanisms of oral tolerance What is a leaky gut? Case study - **Celiac Disease** Review of lectures 1-4; multiple-choice questions **or** Q&A Session on Science & Society Term Paper: **Celiac and non-celiac gluten sensitivity. Facts and Fads**	L. Clemenza
October 11	No class - Midterm 11am-12pm (one hour)	
October 18	**Generating an Adaptive Immune Response** **Our limitless antigen receptor repertoire** How unique genetic mechanisms create antigen receptors that can recognize anything *Upside*: Protection vs newly emerging and quickly evolving pathogens *Downside:* Autoimmunity; need for central tolerance in primary lymphoid tissues **What doesn't kill you makes you stronger** How 'clonal selection' creates a protective lymphocyte army *Upside:* The specificity and memory of the adaptive response *Downside:* lymphoproliferative disorders Case study: **Leukemias and lymphomas** **Beating the odds** How organization and architecture facilitate generation of the adaptive response	W. Tamminen
October 25	**Adaptive Immune Responses in Health and Disease** **Fine-tuning the Adaptive Response** T cell subsets, effector cytokines; cell-mediated and antibody-mediated responses Case study: **Leishmania infection** **HLA – Your 'immunological fingerprint'**	W. Tamminen

	Physiological role of HLA molecules in T cell activation; role of HLA polymorphism in survival HLA in health and disease; role in personalized medicine; limitations and social implications	
November 1st	**David Vetter and the Treatment of 'SCID'** **Primary immunodeficiency disease (PID)** Case study: **David Vetter and 'SCID'** Bone marrow transplantation (BMT) to provide a 'new immune system' **Advances in BMT** Hematopoietic stem cell transplantation; broader applications in fixing immune disorders	W. Tamminen
November 8	**Fall break - no class**	
November 15	**Monoclonal Antibodies in Research and Medicine** **What is a Monoclonal Antibody (mAb)?** Discovery, definition and implications **Detecting the Invisible** Use of mAbs in research and diagnosis **Therapeutic monoclonal antibodies: targeting unwanted cells** Theory of the 'magic bullet'; unconjugated and conjugated antibodies Case study**: Rituximab in treatment of cancer**	W. Tamminen
November 22	Influenza infection: description of viral types, pathogenesis, pandemics in history, H5N1 flu, flu vaccines	T. Watts
November 29	Vaccines and Immunotherapeutics: Vaccine history, fundamentals of vaccines, types of vaccines, successes and challenges, immunotherapy	B. Barber
December 6	**The autoimmunity epidemic** Mechanisms of tolerance to autoantigens: central and peripheral tolerance Impact of genes and environmental factors on susceptibility to autoimmune diseases The hygiene hypothesis Case study: **Type I diabetes**	L. Clemenza

Recommended Textbook:

Exploring Immunology: Concepts and Evidence, by G. MacPherson and J. Austin, 2012 edition, Wiley-Blackwell.

Science & Society Assignment - Paper Topic:
Celiac and non-celiac gluten sensitivity: Facts and Fads

The purpose of this assignment is for you to learn how to summarize the information gathered from several academic (e.g. scientific review articles or primary articles) and non-academic sources (e.g. science news articles from reputable magazines [New Scientist, Scientific American, etc.], or newspapers [New York Times, The Guardian, etc.], reports from government and institution science websites [NIH, Health Canada, WHO, etc.], science blogs, podcasts, etc.) From your collected material you will build a "story" for a general reader with or without a background in science. In other words we want you to submit a piece of science writing using a journalistic approach. Some academic and non-academic references will be provided but you are encouraged to find your own sources of information and inspiration depending on the angle you decide to give to your article.

We will evaluate the following aspects of your paper:

1. **Title (5 marks)** - should be original and captivating, do not use "Science & Society Assignment or paper", do not use "Celiac and non-celiac gluten sensitivity: Facts and Fads".
2. **Tone and style (35 marks)** - decide on the type of narrative you want to deliver (e.g. general information essay mainly aimed at reporting facts, testimonial report/case study, questions and answers, timeline approach, others) and maintain it from the beginning to the end. Your aim is to be informative, interesting, concise and creative. This type of writing requires language that is not too scientific/formal, but it should not be too casual/colloquial either. For example, the use of analogies as a stylistic tool to embellish your prose and make your science story more accessible is welcomed but its overuse is discouraged. Examples of good journalistic science articles will be posted on the course blackboard; and links to science writing tips can be found below.
3. **Content (35 marks)** - Report the facts about celiac disease and about the more controversial non-celiac gluten sensitivity. We will provide a few academic review articles that will help you to contextualize the story you want to convey. However, as mentioned above, you might need to integrate the information provided with additional academic, peer-reviewed readings in the field. In addition, you should report about studies and anecdotal observations that have sparked the gluten-free trend and the expansion of the market of gluten-free products.
4. **Accuracy of information (15 marks)** - You can take sides on arguments surrounding the topic or be neutral, either way we expect that you have checked your facts by consulting a few sources of information (minimum 4 references). We will evaluate

whether you transferred this information in your story accurately. You are allowed a "moderate" use of short quotes in your articles (maximum 3 short sentences) but mostly you will summarize the information you gathered from your sources by writing a story in your own words. In-text citations are not necessary but we require a complete reference list of consulted sources, including all web-derived sources, at the end of your article.

5. **Format, Grammar and spelling (10 marks)** - The paper needs to be 5-6 pages long (max 1800 words) and double-spaced. Font: 12 pt Times. One-inch margins.

To use the words of a well-known science writer (Roger Highfield, former editor of New Scientist and former science editor of the Daily Telegraph) ensure that your article "is interesting, clear and simple enough to grip a general reader yet accurate enough to satisfy a Nobel prizewinner".

Tips about writing for the general public can be found at:
"A field guide for science writers":
http://books1.scholarsportal.info.myaccess.library.utoronto.ca/viewdoc.html?id=2534&page=20
https://www.theguardian.com/science/science-writing-prize
http://awelu.srv.lu.se/genres-and-text-types/writing-in-academic-genres/popular-science-writing/

Important note about a prize for the best Science & Society Paper submitted to Imm250F 2016 or IMM250S 2017
Each TA will select the best paper in their group of students and submit it to the course coordinators for a second round of evaluation. The course coordinators will choose the best of all nominated papers and the winning paper will be published in the Fall 2017 issue of IMMpress Magazine, published by graduate students in the Department of Immunology at the University of Toronto. To follow through with publication of the paper, the winning student will be required to re-format his/her paper to conform to the magazine's requirements.

AVOIDING PLAGIARISM

Your term paper will be subject to "Turnitin" or other originality check softwares. You will be given the chance to check your originality score prior to the final submission of your paper. The instructors will perform the originality check whereas TAs will grade your paper.
It is NOT acceptable to copy & paste information from source material into your term paper.
This is plagiarism. Your paper must be IN YOUR OWN WORDS.

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.

Your term paper is worth 20% of your total grades. The University rule is that the Office of Student Academic Integrity deals directly with academic offenses related to assignments worth more than 10%.

If your paper is tagged by turnitin with a high similarity score (a high similarity score is anything above 25%), we will contact you. You will be given the chance to look at the similarity report generated by Turnitin and talk to us. After this step, we will send the report to the Academic Integrity Office that will start an investigation on the incident.

Remarking term papers

Students who would like more information about where they lost marks should file a request for a term paper re-evaluation utilizing a form that will be made available on blackboard. In this form the student will clearly indicate the reasons for the request and relate these reasons to the TA's comments. Vague requests such as: "I put a lot of effort in this term paper and I think I deserve a higher mark" will not be considered. If a term paper is re-evaluated, a **definitive** mark will be assigned to the term paper. The new mark may be higher than the original mark, or the same or even lower.

Notes from the Office of Student Academic Integrity of UofT

Academic integrity is fundamental to learning and scholarship at the University of Toronto. Participating honestly, respectfully, responsibly, and fairly in this academic community ensures that the U of T degree that you earn will be valued as a true indication of your individual academic achievement, and will continue to receive the respect and recognition it deserves.

Familiarize yourself with the University of Toronto's *Code of Behaviour on Academic Matters* (http://www.governingcouncil.utoronto.ca/policies/behaveac.htm). It is the rulebook for academic behaviour at the U of T, and you are expected to know the rules. Potential offences include, but are not limited to:

In papers and assignments:

- Using someone else's ideas or words without appropriate acknowledgement.
- Copying material word-for-word from a source (including lecture and study group notes) and not placing the words within quotation marks.

- Submitting your own work in more than one course without the permission of the instructor.
- Making up sources or facts.
- Including references to sources that you did not use.
- Obtaining or providing unauthorized assistance on any assignment including
  - working in groups on assignments that are supposed to be individual work,
  - having someone rewrite or add material to your work while "editing".
- Lending your work to a classmate who submits it as his/her own without your permission.

On tests and exams:

- Using or possessing any unauthorized aid, including a cell phone.
- Looking at someone else's answers
- Letting someone else look at your answers.
- Misrepresenting your identity.
- Submitting an altered test for re-grading.

Misrepresentation:

- Falsifying or altering any documentation required by the University, including doctor's notes.
- Falsifying institutional documents or grades.

The University of Toronto treats cases of academic misconduct very seriously. All suspected cases of academic dishonesty will be investigated following the procedures outlined in the *Code*. The consequences for academic misconduct can be severe, including a failure in the course and a notation on your transcript. If you have any questions about what is or is not permitted in this course, please do not hesitate to contact your instructor. If you have questions about appropriate research and citation methods, seek out additional information from your instructor, or from other available campus resources like the U of T Writing Website. If you are experiencing personal challenges that are having an impact on your academic work, please speak to your instructor or seek the advice of your college registrar.