Course Outline for HTH SCI 4003 – Virus Pathogenesis

The premise of the course is for students to learn the fundamentals of virus pathogenesis, (reasons behind symptoms manifestation), which includes the consequences of virus replication in the host tissues and the host defense against virus. The students in this course will apply their knowledge of Immunology and Virology to host-virus interactions and understand in a simple term why we get sick following a viral infection.

The course will focus on the study of several medically important viral infections, which has either significant impact on our healthcare system on ongoing bases (chronic or acute viral infections) or viral infections as potential treats. Both RNA and DNA viruses that exhibit either acute or chronic disease profiles will be studied. In addition, the students will have a choice to also study the role of virus in autoimmune diseases as well as allergy/asthma.

The first 3 weeks will encompass an overview on virus pathogenesis, innate and adaptive immunity to viral infections and how to evaluate and present research articles related to viral pathogenesis by the instructor, followed by student-led tutorials and student/instructor lead discussions. Students, in groups of 3-4, will have to chose a topic of interest and give a group presentation on the topic in two sessions followed by a 3rd session class discussion led by the students and the instructor.

There will be journal paper presentations in tutorial sessions and students will have to present a research journal paper related to the virus pathogenesis and the presented topics. In addition, there will be 2 individual written assignments. The students will have about 4 weeks for complete each assignment. One assignment (short paper, about 1000 words) will be on a research article presented at journal club tutorials each week (each student need to write only one short paper). There will be no written final exam. However, there will be final oral exam in a form of presentation on a specific topic. Marks will be based on presentations, participation and individual essays.

The current outline is as follows: (subject to change)

Weeks 1-3 – Overview lectures by Dr. Ashkar.

Weeks 4-7 – student led presentations and tutorials as well as student/instructor led discussions. Journal paper (in a format of Journal club) presentations on various aspects of virus pathogenesis will be held in tutorial classes (in 2 groups of 10-12).

Week 8 (Monday Feb. 19-25) – no classes; reading week

Weeks 9-14 – student led presentations and tutorials as well as student/instructor led discussions. Journal paper (in a format of Journal club) presentations on various aspects of virus pathogenesis will be held in tutorial classes (in 2 groups of 10-12).

April 12-19, Final exam
In this course, students will have a chance to choose a topic from a list of medically important viral infections as well as the role of virus in autoimmunity and allergy/asthma:

1. Influenza
2. Ebola virus
3. Zika Virus
4. Rotavirus
5. HSV
6. Rabies
7. HIV
8. Dengue virus infection
9. EBV
10. Viral Hepatitis
11. Role of virus in allergy/asthma
12. Human Papilloma Virus (HPV)
13. Monkeypox Virus
14. Rhinovirus (common cold)
15. West Nile virus
16. Mumps Virus
17. Role of viruses in autoimmunity
18. ……

Within the context of these areas, the emphases will be mainly on Pathogenesis of viral infection (virus-induced disease, host pathology etc.). Knowledge of general virology (taxonomy, structure, receptor usage, tropism, replication strategy etc.) and immunology (host immune responses) is essential to understand the pathogenesis of a virus.

Each group will meet with the instructor (Dr. Ashkar) once a week to discuss the topic and get help with the class presentations and prepare a list of interesting topics to discuss in the class.

The lectures are to be 30-40 minutes in duration, allowing for ample time for questions and discussion. In addition, we will have: 1-) an extra session for each topic for class discussion; 2-) use the tutorial times to discuss research article on topics chosen by the students and presented in the class. Therefore, students are required to attend their assigned tutorial. Method(s) used to give the lecture is up to the group members (chalkboard, overheads and/or PowerPoint presentations). A data projector will be available. Each member of a group is responsible for lecture and should be able to answers the questions. After each lecture, marks will be given for the lecture presentation style, content and answers to the questions. Marks will also be given for participation in the discussion period following each lecture.

In addition to the student-based lectures and journal paper presentation, there will be two written essays (done on an individual, not group, basis).

Mark breakdown:
Group presentations 30% (25% + 5%)
Journal Paper presentation/Participation (tutorial) 15% (10% + 5%)
Written tutorial assignment (short assay) 10%
Assignments/Participation 20%
| Final exam | 25% |