SC/BIOL 4155 - ADVANCED VIROLOGY (Fall/2014)

Brief Course Description: This course investigates advanced **concepts** and **experimental systems** in **virology**, including recent **basic** and **applied** research that has led to major scientific innovations in **medicine**, **agriculture** and **nanotechnology**.

Most of the material presented in lectures will be derived from **primary** (experimental) and **secondary** (review) **research articles**. Relevant lecture material will be posted on the course **Moodle website** (see below) for downloading and printing before lectures. This material should be brought to class.

Prerequisites: SC/BIOL 2020 & 2021, SC/BIOL 3155 (*in the future* SC/BIOL 3110 & 3130)

Course Director: Dr. K. Andrew White

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Scheduling: Tue & Thur, 5:30 – 7:00 pm, Room 321 Petrie Science Building

COURSE EVALUATION:

Midterm test (25%) – date **T.B.A.**
Critical Review Paper (30%) – deadline **T.B.A.**
Final exam (45%, **cumulative**) – during official exam period

Test and exam formats: **written answers,** which may include **drawing diagrams**.

Critical review paper: you will be assigned a **primary research article** that you will critically evaluate **independently** using **criteria that will include**, for example, the originality of the work, the importance of the questions addressed, the appropriateness of the techniques used, the quality of the data, and the reliability and significance of the conclusions, *etc.* Your paper will begin with a **relevant introduction** describing where research in the area of the article currently stands. Your paper will end with a short **lay summary** of the article (*i.e.* a summary that a non-scientific member of the public would be able to understand) and your own **summary diagram** which should clearly communicate the main finding of the article.

IMPORTANT:

Missed midterm there is **no make-up test** – weight will be transferred to final exam (*e.g.* final will be worth 70%). 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. (To get the necessary APS form, go to **http://www.registrar.yorku.ca/exams/deferred** and then click on grey tab labeled: **"Steps/Forms"**)

Late submission of Review Paper – for late submissions, there will be a **5% deduction** for each day past the set deadline date.

Missed final exam, you will need to submit an **"Academic Petition Form"** (**http://www.registrar.yorku.ca/pdf/petition_package.pdf)** bring a **filled in Deferred Standing Agreement** form, a **filled in Attending Physicians Statement** and a **filled in Course Performance** form to the undergrad office (Farq. 108)**.** The undergrad office will provide you with further instructions on how to file your petition. **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.

IMPORTANT GENERAL INFORMATION FOR STUDENTS: *i.e.* **Academic Honesty/ Integrity**, Ethics Review Process, Access/Disability, Student Conduct, Religious Observance Accommodation. Information on these and other important policies are posted at:
http://www.yorku.ca/secretariat/policies/

SC/BIOL 4155 - ADVANCED VIROLOGY (Continued)

COURSE RESOURCES:

Primary and secondary research articles

Moodle: https://moodle.yorku.ca

Additional subjects for discussion may be derived from the virology-related websites:

"This Week In Virology" (TWIV)
http://www.twiv.tv/

"Virology Blog"
http://www.virology.ws

"ViralZone"
http://viralzone.expasy.org

SELECTED TOPICS WILL BE CHOSEN FROM THOSE LISTED BELOW:

1. **Cellular antiviral defense systems: how animals, plants and bacteria protect themselves**
   e.g. innate immunity, gene silencing, CRISPR

2. **Viral counter-defense strategies: how viruses fight back**
   e.g. viral inhibitors of: innate immunity, gene silencing, CRISPR

3. **Novel antiviral treatments: drugs vs. gene therapy**
   e.g. antiviral: novel drugs, RNAi, cell replacement, plant genetic engineering

4. **Ebola virus: a current danger**
   e.g. intro. to virus & lifecycle, origin of epidemic, spread, containment, treatment, *etc*.

5. **Viral host factors: the missing half of our knowledge**
   e.g. RNAi screens to identify viral host factors, surrogate yeast systems for genetic screens

6. **Virus hunting: searching for new viruses and potential threats**
   e.g. deep sequencing, viral metagenomic analyses, potential viral threats to plants and animals

7. **Good virus: beneficial uses of viruses**
   e.g. viral vectors, viral nanoparticles, fighting cancer with viruses

8. **Controversies in Virology:** *e.g*. XMRV virus and chronic fatigue syndrome, can poliovirus be eradicated?, is a cure for HIV achievable?, genetically-modified food, fraud in science