

Department of Biology Course Outline

BIOL 4155 Advanced Virology (2019-2020)

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

Prerequisites (strictly enforced)

SC/BIOL 3110, SC/BIOL 3130, SC/BIOL 3155

Course Instructor(s) and Contact Information

Prof. K. Andrew White
B304 Farquharson Building (3rd floor)
kawhite@yorku.ca

Schedule

Tue and Thru, 5:30 – 7:00 pm

Evaluation

Midterm test (25%)
Independent Critical Review Paper (30%)
Final exam (45%, cumulative) – during official exam period

Important Dates

Dates of Tests/Exams, Due Dates of Major Assignments, First class, last class, last day to switch lab sections, drop date, etc.

Drop Deadline: Fri. Nov. 8, 2019 (last day to drop without course on transcript)
Course Withdrawal: Sat. Nov. 9 – Tue. Dec. 3, 2019 (course still appears on transcript with “W”)

NOTE for instructors: for additional important dates such as holidays, refer to the “Important Dates” section of the Registrar’s Website at <http://www.yorku.ca/yorkweb/cs.htm>

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>

Learning Outcomes

Upon successful completion of this course, students should be able to

1. Explain the molecular strategies used by viruses and their hosts to protect themselves from each other
2. Describe the mechanisms of action and effectiveness of new antiviral strategies
3. Provide details on the functions of cellular proteins misappropriated by viruses and the various screens used to identify them
4. Outline different experimental strategies used to identify new and emerging viruses and understand their threat levels and potential host targets
5. List different ways that viruses are being used to perform useful functions for society
6. Critically evaluate recent controversies in virology and provide an opinion based on available experimental evidence
7. Appreciate the close and interdependent relationship between applied and basic research
8. Understand cutting-edge experimental approaches used in virology research
9. Critically evaluate experimental design
10. Assess experimental results and propose improvements to existing methodology
11. Determine the validity of conclusions drawn based on data
12. Apply techniques learned to answer new/different questions
13. Provide defensible justifications for answers
14. Clearly convey scientific opinion and ideas verbally and in writing
15. Utilize web-based virology resources

Course Content

SELECTED TOPICS WILL BE CHOSEN FROM THOSE LISTED BELOW:

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

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

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

Ebola virus: an existing threat
e.g. intro. to virus & lifecycle, origin of epidemic, spread, containment, treatment, etc.

Zika virus: a more recent threat
e.g. intro. to virus & lifecycle, origin of epidemic, spread, containment, treatment, etc.

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

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

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

Experiential Education and E-Learning

Other Information

Course Policies

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.

Late submission of Independent Critical Review Paper – for late submissions, there will be a 10% deduction for each day past the set deadline date.

Missed final exam, you will need to file a petition to write a deferred exam. 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.

University Policies

Academic Honesty and Integrity

York students are required to maintain the highest standards of academic honesty and they are subject to the Senate Policy on Academic Honesty (<http://secretariat-policies.info.yorku.ca/policies/academic-honesty-senate-policy-on/>). The Policy affirms the responsibility of faculty members to foster acceptable standards of academic conduct and of the student to abide by such standards.

There is also an academic integrity website with comprehensive information about academic honesty and how to find resources at York to help improve students’ research and writing skills, and cope with University life. Students are expected to review the materials on the Academic Integrity website at - <http://www.yorku.ca/academicintegrity/>

Access/Disability

York University is committed to principles of respect, inclusion and equality of all persons with disabilities across campus. The University provides services for students with disabilities (including physical, medical, learning and psychiatric disabilities) needing accommodation related to teaching and evaluation methods/materials. These services are made available to students in all Faculties and programs at York University.

Students in need of these services are asked to register with disability services as early as possible to ensure that appropriate academic accommodation can be provided with advance notice. You are encouraged to schedule a time early in the term to meet with each professor to discuss your accommodation needs. Please note that registering with disabilities services and discussing your needs with your professors is necessary to avoid any impediment to receiving the necessary academic accommodations to meet your needs.

Additional information is available at the following websites:

Counselling & Disability Services - <http://cds.info.yorku.ca/>

Counselling & Disability Services at Glendon - <https://www.glendon.yorku.ca/counselling/>

York Accessibility Hub - <http://accessibilityhub.info.yorku.ca/>

Religious Observance Accommodation

York University is committed to respecting the religious beliefs and practices of all members of the community, and making accommodations for observances of special significance to adherents. Should any of the dates specified in this syllabus for an in-class test or examination pose such a conflict for you, contact the Course Director within the first three weeks of class. Similarly, should an assignment to be completed in a lab, practicum placement, workshop, etc., scheduled later in the term pose such a conflict, contact the Course director immediately. Please note that to arrange an alternative date or time for an examination scheduled in the formal examination periods (December and April/May), students must complete and submit an [Examination Accommodation Form](#) at least 3 weeks before the exam period begins. The form can be obtained from Student Client Services, Student Services Centre or online at http://www.registrar.yorku.ca/pdf/exam_accommodation.pdf

Student Conduct in Academic Situations

Students and instructors are expected to maintain a professional relationship characterized by courtesy and mutual respect. Moreover, it is the responsibility of the instructor to maintain an appropriate academic atmosphere in the classroom and other academic settings, and the responsibility of the student to cooperate in that endeavour. Further, the instructor is the best person

to decide, in the first instance, whether such an atmosphere is present in the class. The policy and procedures governing disruptive and/or harassing behaviour by students in academic situations is available at - <http://secretariat-policies.info.yorku.ca/policies/disruptive-andor-harassing-behaviour-in-academic-situations-senate-policy/>