

## Department of Biology Course Outline

SC/BIOL 3155 3.00 Virology  
Winter 2023-4

### Land Acknowledgement

York University recognizes that many Indigenous Nations have longstanding relationships with the territories upon which York University campuses are located that precede the establishment of York University. York University acknowledges its presence on the traditional territory of many Indigenous Nations. The area known as Tkaronto has been care taken of by the Anishinabek Nation, the Haudenosaunee Confederacy, and the Huron-Wendat. It is now home to many First Nation, Inuit, and Métis communities. We acknowledge the current treaty holders, the Mississaugas of the Credit First Nation. This territory is the subject of the Dish with One Spoon Wampum Belt Covenant, an agreement to peaceably share and care for the Great Lakes region.

### Course Description

An in-depth examination of cellular, molecular, and structural aspects of virology. Molecular processes and concepts are emphasized using examples from current research literature. Virus-host interactions are investigated in various systems.

### Learning Outcomes

The main objective of the Virology course is to develop the understanding of the basic molecular and cellular concepts and principles related to viral infections, and its medical application to treatment and prevention.

Upon completion of the Virology course, students will

- be able to explain concepts related to different types of life cycles of different viruses.
- understand the seven methods of viral replication (Baltimore's scheme)
- understand the principles of virus structure.
- be familiar with disease-causing viruses, the transmission of pathogenic viruses, host responses, and how pathogens attempt to evade the body's immune system.
- develop and use critical thinking skills.

### Disclaimers

The information presented in the lectures is provided for educational purposes only and should not be considered medical advice.

### Prerequisites

SC/BIOL 2020 3.00 and SC/BIOL 2021 3.00

**WARNING: Students without prerequisites will be de-enrolled.**

## Course Instructors and Contact Information

### Course Director

Dr. Motti Anafi

e-mail: [moanafi@yorku.ca](mailto:moanafi@yorku.ca)

I will usually be available after each in-class meeting to address individual questions. If you need to speak with me out of class, please send me an email to set an appointment.

### Course TA/markers

Jennifer Im [imjenim@my.yorku.ca](mailto:imjenim@my.yorku.ca)

Riddhi Jani [rj2203@my.yorku.ca](mailto:rj2203@my.yorku.ca)

Mahtab Zonouzi-Marand [mahtabz@my.yorku.ca](mailto:mahtabz@my.yorku.ca)

### Emailing the Course Director

Your email will be read and answered as soon as possible. However, we will open only e-mails that fulfill the following requirements:

- Your email must be sent from your regular yorku.ca email account (**not from the eClass server**). As much as possible, do not use non-yorku.ca accounts (such as Hotmail or personal Gmail). Emails from non-yorku.ca accounts will likely languish in a spam folder that is checked only intermittently.
- Be sure to include your full name and student number in your email text.
- Your email must include "BIOL3155" in the subject line. (I am teaching other courses).
- Your email must NOT include an attachment.

## Evaluation

Mid-Term Exam 1      25%

Date: Thursday, Feb 1, 2024

Time: 5:30 pm

Location: TBA

Duration: 60 minutes

The exam covers parts 1 and 2 of the course.

Mid-Term Exam 2      25%

Date: Thursday, March 7, 2024

Time: 5:30 pm

Location: TBA

Duration: 60 minutes

The exam is cumulative but will be concentrated on parts 3 and 4.

Final Exam              50%

Date and location: will be published by the registrar's office.

Duration: 180 minutes

The exam is cumulative with a bit more questions in parts 5 and 6

- **The midterms and final exams are cumulative: everything discussed in the pre-recorded lectures and its applications, to be discussed in the in-person meetings, is a "fair game" on exams.**
- **Mid-terms and final exams will take place in person only. NOT online. You must be on campus to write them.**
- **It is your responsibility to ensure that you are available to sit for final examinations during the entire exam period for the Winter term (April 10-25)**

## Course Content

**Course Outline (+optional reading, resources)** Note: Just clicking a link may not work. You need to copy the address and put it in the address bar of your browser.

The entire course is based on 1153 minutes of prerecorded lectures. You are expected to cover approximately 110 minutes a week of the prerecorded lectures.

**Part 1: Principles in virology (153 minutes. Need to be covered in weeks 1 and 2 of the course)**

Flint Vol I Chp 1

<http://www.microbiologybook.org/mhunt/intro-vir.htm>

**Part 2: Structure of viruses (110 minutes. Need to be covered in weeks 2 and 3 of the course)**

Flint Vol I Chp 4

<http://www.microbiologybook.org/mhunt/intro-vir.htm>

Mid-term 1 (Part 1 and 2 to take place on week 4 of the course)

**Part 3: Viral replication (311 minutes. Need to be covered on weeks 3, 4, 5 and 6 of the course)**

- DNA virus replication strategies

Flint Vol I Chp 9

<http://www.microbiologybook.org/mhunt/dna1.htm>

<http://www.microbiologybook.org/lecture/chemo.htm>

- RNA virus replication strategies

Flint Vol I Chps 6 and 7

<http://www.microbiologybook.org/mhunt/rna-ho.htm>

**Part 4: Lytic replication cycle (139 minutes. Need to be covered on weeks 6 and 7)**

Flint Vol I Chps 5 and 13

<http://www.microbiologybook.org/mhunt/replicat.htm>

Mid-term 2 (Cumulative, but concentrated on parts 3 and 4. To take place on week 8 of the course)

**Part 5: Immunological Antiviral Prevention and Treatment (335 minutes. Need to be covered on weeks 7, 8, 9 and 10 of the course)**

- Basic concepts in immunology

Flint Vol II Chps 3 and 4

<http://www.microbiologybook.org/ghaffar/mhc2000.htm>

<http://www.microbiologybook.org/bowers/mhc.htm>

- Vaccination and passive immunization

Flint Vol II Chp 8

<http://www.microbiologybook.org/lecture/vaccines.htm>

<http://www.microbiologybook.org/ghaffar/immunization-ver2.htm>

**Part 6: Influenza: Genetics, Treatment and Prevention (233 minutes. Need to be covered on weeks 10, 11 and 12 of the course).**

Flint Vol II Chps 10 and 11

<https://www.cdc.gov/flu/>

<https://www.microbiologybook.org/mhunt/flu.htm>

Final exam (Cumulative. a bit more questions on parts 5 and 6)

The overall prerecorded lecture time is about 1153 minutes (19.2 hrs). You are expected to cover approximately 110 minutes of pre-recorded lectures every week according to the order they appear in the eClass and the course outline. In addition, you need to attend the

**one-hour in-person meeting. If for some reason you choose not to cover the lecture in a certain week (e.g. due mid-term for the course), you need to catch up and cover ~220 minutes of lecture in the following week. As for writing a mid-term, you will write it 1 week after you were supposed to complete covering the material for that mid-term. Do not wait to cover the material of the second (or third) package until the time after the evaluation of the previous package. By the time of the first mid-term, you need to study the second material package, etc.**

**You need to cover the material in the order they appear in the eClass and the course outline at the indicated time. 110 minutes of prerecorded lectures every week. You need to cover the material before the in-person meeting as the discussion in the in-person meetings is based on the fact that you covered the pre-recorded lecture on time.**

**In general, students need to be prepared to deal with weather and technical issues.**

**If you do not have the internet working at home for any reason (technical issues, weather, etc.)**

- A. You should go to the university. Here, the internet is always on.**
- B. You can use your cellular data by making your cellphone a “hotspot”.**
- C. You should always take offline notes and have summaries of the lectures. Make sure not to fully rely on the internet.**
- D. Cover the lecture on time and take notes as you cover the prerecorded lecture. Do not wait until the last moment before the exam.**
- E. Make the appropriate travel arrangements to be in class on time for classes and exams.**

## **Experiential Education and E-Learning**

### **The Course eClass website**

To access eClass, please follow the instructions below.

1. Go to: <https://eclass.yorku.ca/eclass/my/>
2. Login with your Passport York account.

Here you will find

- Announcements
- An updated course outline
- A link to Flint Virology on reserve
- Pre-recorded lectures
- Forum
- Grades
- Wiki (note sharing activity)

If you have technical eClass-related questions, please direct them to UIT Client Services at 416-736-2100 x55800 or email [helpdesk@yorku.ca](mailto:helpdesk@yorku.ca).

Please note that the course director's announcements on the eClass take precedence over any other information (especially if you are communicating with each other via WhatsApp etc.).

## Resources

**Required Readings:** Principles of Virology, Bundle (available at YorkU bookstore)

ISBN: 978-1-683-67358-3

Authors: Jane Flint, Vincent R. Racaniello, Glenn F. Rall, Anna Marie Skalka

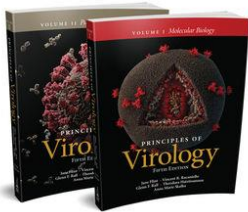
Check: [https://www.wiley.com/en-](https://www.wiley.com/en-us/Principles+of+Virology%2C+Multi+Volume%2C+5th+Edition-p-9781683673583)

[us/Principles+of+Virology%2C+Multi+Volume%2C+5th+Edition-p-9781683673583](https://www.wiley.com/en-us/Principles+of+Virology%2C+Multi+Volume%2C+5th+Edition-p-9781683673583)

<https://www.youtube.com/watch?v=c2RuFFOojW8>

**The textbook is on reserve:**

- 1) as an e. book from York Library: [https://ocul-yor.primo.exlibrisgroup.com/permalink/01OCUL\\_YOR/j50f41/cdi\\_askewsholts\\_vlebooks\\_9781683673583](https://ocul-yor.primo.exlibrisgroup.com/permalink/01OCUL_YOR/j50f41/cdi_askewsholts_vlebooks_9781683673583)
- 2) In addition, I placed two copies of vol. 1 & 2 at Scott Library and one copy of vol. 1 & 2 at Steacie Library, since Steacie is closed on the weekend. The call number : QR 360 P697 2020 V.1 & QR 360 P697 2020 V.2.



2) For optional readings go to <http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=Books> and search for keywords. You can find information on viruses in:

**Medical Microbiology.** 4th edition Baron, Samuel, editor.

**Retroviruses.** Coffin, John M.; Hughes, Stephen H.; Varmus, Harold E.

**Other resources:**

<http://www.cdc.gov/>

<http://viralzone.expasy.org/>

<http://www.microbiologybook.org/book/virol-sta.htm>

## Teaching methods

- In the last couple of years, we had at the university many discussions about the best teaching methods for “online” and “in-person” courses. As for BIOL3155 Winter 2024, I decided to take the best from both methods and combine them together. I decided to use **flipped course strategies**.
- **What is a flipped classroom strategy?**  
Flipped lessons replace in-class lectures with prerecorded lectures that students watch and interact with at home. Later, they apply what they learned at home from the prerecorded lectures in sessions in-class through various activities such as questions answers, and discussions.

- Accordingly, the lectures and the discussions are going to be delivered in two different modes: First, students need to cover the relevant pre-recorded lecture/s on their own, and second, we will have In-class / in-person meetings for further discussions of the material covered in the pre-recorded lectures, including Q & A sessions, after exam reviews and much more.
- The online portion will be online only (I will not repeat the entire lecture in class)
- The in-class portion will be in-class only. For many reasons, the in-class session will not be recorded. **YOU NEED TO ATTEND THE CLASS FOR IN-CLASS ACTIVITIES.**
- Still, I opened for you an activity called WIKI where students can post summaries of the in-class activities. Furthermore, the FORUM can be used for questions and discussions as well.
- **All exams (mid-terms and final) will take place in class only.** There is no online version for these evaluations.
- The pre-recorded lectures and the in-person meetings consist of the complete material of the course. As for the in-class portion of the course: We will meet in class once a week. **Students need to attend these meetings. Please make sure to cover the corresponding prerecorded lectures before the “in-person” meeting to be prepared for the discussions.**
- The pre-recorded lectures will be posted in three “waves”: the first cluster is the lectures for the chapters to be covered on the first mid-term. Later, as the second cluster, the lectures cover the second mid-term. Later, I will post the rest of the material for the course.
- Students can use the delivery method in quite a flexible way: For example, you can access the visual material covered in high-resolution pre-recorded lectures at any time convenient to you as many times as you wish. You will have the flexibility to view the entire lecture at once or to stop the lecture at any stage of the lecture. You can run the lecture more quickly or slowly. You can turn down/up the audio as you wish.
- The prerecorded lectures are based on multimedia presentations run by several programs. It is not “PowerPoint slides”. The lectures were developed using a Video editor which stitched together videos, animations, images text, and many other activities.
- In order to have a "PowerPoint-like experience," you can mute my voice, and run the high-resolution video on a full screen. Here you can stop the video any time you wish to have the image for as long as you need it.

**Few tips on how to study for the course:**

- As for the exams, you must know and understand the material presented in the pre-recorded lectures **and its applications which many of them will be discussed in the in-person meetings.**
- The textbook and the other readings can help students consolidate and expand their understanding of the material. On the exams, I will **concentrate** on topics covered in the pre-recorded lectures **and their applications.** However, reading the required material and attending the “in-class” meetings are likely to be very helpful for you in dealing with the applications of the material in the prerecorded lectures.
- The material presented in the lectures and other components of the course such as exams have been developed from a large variety of resources, including websites, textbook supplements, and other materials mentioned in the course outline.
- I will usually be available before/after each lecture to address individual questions. If you need to speak with me out of class, please send me an email to set an appointment.

## Schedule

### Course Schedule and Location

- **Thursdays 5:30-6:30 pm in LAS C:** This is the in-class portion of the course.
- **The rest of the time, ~110 minutes a week:** This time is dedicated to the online portion of the flipped classroom, to be used by students on their own to cover the material of the prerecorded lectures. In general, No regular “in-person” class on Tuesdays. **However, Tuesdays may be used to compensate for unique circumstances (mid-term exams that need to be postponed, mid-term exam viewing, etc.). In your schedule, you need to keep Tuesdays 5:30-7:00 pm available for possible in-class activity.**

## Course Policies

### Tests and Exams

- No opportunities to make up missed mid-term exams will be offered. In all cases of missed mid-term exam, the percentage value of the missed mid-term will be added to the final exam.
- If the final exam is missed, the student must petition the Registrar for permission to write the final exam.
- The level of difficulty and the material covered on the deferred final exam will be similar to the original exam. However, **the format of all deferred mid-terms/final exams is likely to be different from the original exam (e.g., short answer questions or oral exams instead of multiple-choice questions).**
- If the deferred final exam is missed the student must petition their home faculty again for permission to write a second deferred final exam.
- No doctor notes or any other documentation is required for missed mid-terms and final exams. As for the petition to write deferred exams, the documentation needed is according to the policy of your home faculty.

It is your responsibility to ensure that you are available to sit for final examinations during the entire exam period for the Winter term (April 10-25)

### Rules for viewing term tests:

- After each exam, we will have a detailed academic feedback session in the following in-class meeting. No makeup. No private feedback.
- If you are interested in viewing your exam and comparing it against the key, you need to send an e-mail to the course TA (TBA) **by two weeks after the day the grades were posted** on the eClass. Every exam viewing session will be up to 20 minutes for viewing the exam and comparing it against the key. During test viewing sessions the regular examination rules will apply (to be specified). If after you viewed your exam against the key, you feel that you deserve more marks you can send an e-mail to the course director (Attn: Dr. Motti Anafi, e-mail: moanafi@yorku.ca).

### Copyright protection of the posted pre-recorded lectures

1) The material presented in the pre-recorded lectures has been developed from a large variety of resources, including websites and textbooks, including many figures from the required reading (Flint Virology). Here, the rules below are for meeting the copyright agreement I have with the publisher of this textbook.

2) The prerecorded lectures are copyright-protected by the course director and many third parties, private people, and organizations. We have permission from the publisher to use their material only in the prerecorded lectures embedded in the eClass.

3) The prerecorded lecture will be available for you through the course on the eClass. You can use them in the eClass. The prerecorded lectures are "unlisted" on YouTube- **do not share the link with others and do not use the link directly. You need to go to eClass and sign in with your York Password, and to watch the video on the the eClass only.**

4) Students are NOT allowed to copy the videos and/or to post them elsewhere, directly or as an embedded link, or to share the link with others.

**5) Not complying with any of the above will be considered an infringement of copyright law.**

6) I am doing my best to post the credit for the developers of each external resource that was included in my lectures. However, in some cases, the original material is no longer available on the web, and finding the person or organization that deserved the credit may not be possible despite my efforts.

## Important Dates

### Important Dates for Fall (F), Year (Y) and Winter (W) Terms

#### Sessional Dates

EVENT	FALL (TERM F)	YEAR (TERM Y)	WINTER (TERM W)
Classes start	September 6	September 6	January 8
Last date to announce components of final grades	September 20	September 20	January 22
Fall Reading Week <sup>1</sup>	October 7-13	October 7-13	
Last date to submit Fall term work	December 5	December 5	
Fall classes end	December 5	December 5	
Fall Study Day <sup>2</sup>	December 6	December 6	
Fall examinations <sup>3</sup>	December 7-20	December 7-20	
Winter Reading Week <sup>1</sup>		February 17-23	February 17-23
Last date to submit Winter term work		April 8	April 8
Winter classes end <sup>4</sup>		April 8	April 8
Winter Study Days <sup>2</sup>		April 9	April 9
Winter examinations <sup>3</sup>		April 10-25	April 10-25
Notes		Passover begins at sundown Tuesday, April 22 and ends at nightfall on Tuesday, April 30	Passover begins at sundown Tuesday, April 22 and ends at nightfall on Tuesday, April 30

#### Add/Drop Deadlines

	FALL (TERM F)	YEAR (TERM Y)	WINTER (TERM W)
Last date to add a course <b>without permission</b> of instructor (also see Financial Deadlines)	September 20	September 20	January 22
Last date to add a course <b>with permission</b> of instructor (also see Financial Deadlines)	September 28	September 28	January 31
Drop deadline: Last date to drop a course without receiving a grade (also see Financial Deadlines)	November 8	February 8	March 11
Course Withdrawal Period (withdraw from a course and receive a grade of "W" on transcript – see note below)	November 9 - December 5	February 9 - April 8	March 12 - April 8

**Drop Deadline:** For an appropriate term (last day to drop without a course on transcript)

**Course Withdrawal Deadline:** For appropriate term (course still appears on transcript with 'W')

For updates check <https://registrar.yorku.ca/enrol/dates/2023-2024/fall-winter>



### Grading Scheme

In accordance with the York University Undergraduate Calendar Regulations, the letter grades assigned in undergraduate courses at York conform to the descriptions and grade ranges shown here: <https://calendars.students.yorku.ca/2022-2023/grades-and-grading-schemes>

### Academic Honesty and Integrity

Academic misconduct undermines the values of honesty, trust, respect, fairness, and responsibility that we expect in this class. York University provides supports such as academic integrity workshops to ensure that all students understand the norms and standards of academic integrity that we expect you to uphold.

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. Please review and familiarize yourself with the policy.

There is also an academic integrity website with comprehensive information about academic honesty and how to find resources at York to help improve your research and writing skills, and cope with University life. Students are expected to review the materials on the Academic Integrity website:

#### **Examples of actions that do not adhere to York's Academic Integrity Policy include:**

- Plagiarism (passing off someone else's work as your own)
- Accessing unauthorized sites for assignments or tests
- Unauthorized collaboration on assignment and exams
- Uploading work to third party repository sites (e.g., Course Hero, One Class, etc.)
- Scanning, sharing, uploading, or publishing exams, tests, or scholarly work

For more information on what academic integrity is and why it is important see:

<https://spark.library.yorku.ca/academic-integrity-what-is-academic-integrity/>. Information on

the process of investigations into breaches of academic honesty:

<https://spark.library.yorku.ca/academic-integrity-breach-of-policy-on-academic-honesty/>

#### **Important Note from the FSc Committee on Examinations & Academic Standards**

**(CEAS):** Numerous students in Faculty of Science courses have been charged with academic misconduct when materials they uploaded to third party repository sites (e.g., Course Hero, One Class, etc.) were taken and used by unknown students in later offerings of the course. Whenever a student submits work obtained through an external site (e.g., Course Hero, Chegg), the **submitting student will be charged with plagiarism** and the **uploading student will be charged with aiding and abetting**. To avoid this risk, students are urged not to upload their work to these sites.

## Assistance for Students (Academic and Well-Being)

**Academic Advising\***: <https://www.yorku.ca/science/academic-advising/> \* Departments also offer program-specific advising. Check with your Department's Undergraduate Office.

Centre for Human Rights, Equity, and Inclusion: <https://rights.info.yorku.ca>

Centre for Indigenous Students Services: <https://aboriginal.info.yorku.ca/>

**Good2Talk 24-hour Ontario Student Helpline**: 1-866-925-5454 /Text: GOOD2TALKON to 686868

**Keep.meSAFE**: <https://myssp.app/keepmesafe/ca/home>

**Learning Commons** (general academic learning supports including library research, time management, study skills, career planning, etc.): <https://learningcommons.yorku.ca/>

**Peer Assisted Study Sessions (PASS)**: <https://www.yorku.ca/colleges/bethune/get-help/pass/>

**Peer Tutoring**: <https://www.yorku.ca/colleges/bethune/get-help/peer-tutoring/>

Sexual Violence Response and Support: <https://thecentre.yorku.ca>

Student Counselling, Health & Well-being: <https://counselling.students.yorku.ca/>

**Support Services for International Students:**

<https://yorkinternational.yorku.ca/international-student-support/>

**Writing Services**: <https://www.yorku.ca/colleges/bethune/get-help/writing/>

York University Student Services: <https://family.yorku.ca/student-services/#SCD>

York University Student Well-being Resources: <https://www.yorku.ca/well-being/resources/students/>

## Accessibility

York University is committed to principles of respect, inclusion, and equality of all persons with accessibility needs across campus. The University provides services for students with accessibility needs (including physical, medical, learning, and psychiatric needs) 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 accessibility 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 accessibility 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:**

**Student Accessibility Services**: <https://accessibility.students.yorku.ca>

**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. 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 accommodation request form at least 3 weeks before the exam period begins. <https://secure.students.yorku.ca/pdf/religious-accommodation-agreement-final-examinations.pdf>

### **Student and Instructor 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/>.

Academic accommodation refers to educational practices, systems and support mechanisms designed to accommodate diversity and difference. The purpose of accommodation is to enable students to perform the essential requirements of their academic programs. At no time does academic accommodation undermine or compromise the learning objectives that are established by the academic authorities of the University.

University rules regarding registration, withdrawal, appealing marks, and most anything else you might need to know can be found on the university's website, here:

<https://calendars.students.yorku.ca/2021-2022/policies-and-regulations>