

Department of Biology Course Outline

GS/BIOL 5028 Topics in Molecular Biology II: Proteins Winter 2022

Technology Requirements:

You **must have access to reliable high-speed internet connection (wi-fi) and a computer** in order to take this course.

The following are also required:

- Access to audio (including microphone) and a web cam. Some aspects of the course will involve video conferencing software (e.g. Zoom).
- Reliable access to eClass and ability to stream videos from eClass.

Course Description

BIOL5028 is a graduate level course. This course covers the area of molecular biology focused on proteins, including topics in protein structure and function, and methods used to study protein structure and function.

Prerequisites

Undergraduate courses in biochemistry and molecular biology.

Course Instructors and Contact Information

BIOL5028 instructor:

Yi Sheng

To contact the instructor, please email yisheng@yorku.ca .

I will try to respond to email within two working days, but this is not always possible, so please be patient. Questions and answers that we deem of interest to the entire class will be posted (without identifiers) on the appropriate discussion forum on eClass.

Please remember to exercise email etiquette and professional correspondence.

- **Subject Line** - Include brief indication of topic. E.g. "question about XXXX"
- Include your **name** and **student number** at the end of each email.

Please do not use the eClass (formerly Moodle) Messenger for contact. This system is not used for this course and messages will not be answered.

Course Schedule & Format - All Online

This course will be delivered remotely (entirely online). **There are no in-person activities.**

Lectures: Fridays, 2:30 PM – 5:30 pm, online via Zoom.

Office Hrs: By appointment and via Zoom

Lecture material will be delivered both asynchronously (posted on the eClass website) and synchronously (by video conferencing software during posted lecture times). Please see your Lecture eClass site for details.

Resources

Textbook

No specific text required

Course eClass Sites

<http://eClass.yorku.ca> .

[GS/BIOL5028 - Topics in Molecular biology II: Proteins \(Winter 2021-2022\)](#)

Evaluation

This course consists of:

Assignments:	40%
Presentations:	20%
Poster Project:	20%
Class Participation:	20%

Details of each assignment and activity will be posted on eClass.

Class Participation (20%):

Class participation is an important component of learning process. Students will be required to participate in various activities in class and through eClass. Details will be posted on course website.

Final course grades may be adjusted to conform to Program or Faculty grades distribution profiles.

Copyright Protection of Course Material

All material associated with this course is the intellectual property of the instructors and/or protected under Canadian Copyright Law.

All material associated with this course, including lecture materials, recordings, and activities are to be used for personal study purposes only. **Unauthorized distribution in any form can lead to a violation under Canadian Copyright Law and/or Academic Misconduct charges under York University Senate Policy.** Unauthorized distribution includes sharing and/or uploading of material anywhere and with anyone.

Penalties under Academic Misconduct can include failure in the course, a transcript notation and/or suspension.

Important Dates

GS/BIOL5028 Winter 2022 **Feb. 18th – Apr. 8th**

1st Lecture - 3 hrs:

Friday Feb. 18th, 2022. 2:30 PM – 5:30 PM

Winter reading week:	Feb. 19th - 25th (No class)
2 nd Lecture – 3 hrs:	Friday Mar. 4th, 2022. 2:30 PM – 5:30 PM
3 rd Lecture – 3 hrs:	Friday Mar. 11th, 2022. 2:30 PM – 5:30 PM
4 th Lecture – 3 hrs:	Friday Mar. 18th, 2022. 2:30 PM – 5:30 PM

Poster & presentation (6 hrs): **Apr. 1st & Apr. 8th**

See the **Lecture eClass site** for additional deadlines .

Course Learning Outcomes

By the end of this course, you are expected to demonstrate the following knowledge and skills:

1. Fundamental principles about protein structure and function.
2. Protein sequence analysis and interpretation.
3. Protein 3D structure analysis and interpretation
4. Experimental techniques, and interpretation of results
5. Bioinformatic tools for studying proteins

Course Content

The overall theme of this course is the study of the three-dimensional structures of proteins and protein complexes. The three-dimensional structure is essential in the function of the protein. Studying protein structures reveals clues about its function and molecular mechanism. In this course, you will examine in detail the structures of proteins, from their amino acid sequences to their fully folded forms. You will use different softwares and bioinformatic tools to analyze proteins and their interaction with other biomolecules (proteins, nucleic acids, and small molecules).

Lecture Topics will include

- Principles about protein structure and function
- Protein sequence analysis
- Protein 3D structural analysis
- Protein analysis by proteomics

Course Policies

Course format: Classes will start at 2:30 PM on the scheduled class dates with a live session via Zoom (link is posted on eClass page). The live sessions are intended to last about 3 hrs for each class. Students should view course material posted on eClass and complete the activities for the week.

Equipment needed for online learning: As the course is delivered online, each student will need **i)** a computer or equivalent for accessing online material; **ii)** software such as Zoom to participate in the live Zoom sessions, **iii)** access to internet for the streamed and recorded lectures, **iv)** a webcam for interaction and online proctoring; and **v)** a suitable learning environment for participating in the live lectures.

Joining Zoom meetings: Students must join Zoom meetings through the links posted on eClass or sign in to Zoom using the **SSO sign in**.

Zoom and privacy: Part of the course is conducted live via Zoom and will be recorded for broader student access. Note that Zoom is hosted on servers in the US. If students have privacy concerns about their data, they should only provide their first name when joining a session. Note also that the system is configured such that all participants are automatically notified when a session is being recorded.

Students are reminded here that all lecture material posted online (via eClass and Zoom) are copyrighted and they are **NOT allowed** to download, copy, or keep the recorded material. Students are also **NOT allowed** to distribute or share the online course material.

Expectations: Students are EXPECTED to access eClass and attend all live ZOOM classes. Students are expected to complete online eClass activities and assignments.

Reappraisal Requests

If you believe that a course evaluation component was graded incorrectly, you may request a grade reappraisal for the work. You must submit a written rationale for a reappraisal request that is based on academic grounds* to yisheng@yorku.ca within one week of the material being made available to you. If it is determined that you have provided sufficient academic grounds, the material will be regraded by an instructor.

Note: Regrading can result in the grade being raised, confirmed or lowered.

**Academic grounds means you make an academic argument for why your answer is correct – statements such as “this grade does not reflect my knowledge” or “I really studied hard and I deserve a better grade” are not academic grounds.*

University Policies

Academic Honesty and Integrity – No Cheating Rule

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/>

Important - A note from the Faculty of Science Committee on Examinations and Academic Standards:

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. The Faculty's Committee on Examinations and Academic Standards (CEAS) found in these cases that the burden of proof in a charge of aiding and abetting had been met.

Accordingly, to avoid this risk, students are urged not to upload their work to these sites. Whenever a student submits work obtained through a third party site (e.g. Course Hero, One Class etc.), the submitting student will be charged with plagiarism and the uploading student will be charged with aiding and abetting.

Note also that exams, tests, and other assignments are the copyrighted works of the professor assigning them, whether copyright is overtly claimed or not (i.e. whether the © is used or not). Scanning these documents constitutes copying, which is a breach of Canadian Copyright law, and the breach is aggravated when scans are shared or uploaded to third party repository sites.

Penalties associated with charges of Academic Misconduct can include zero on the assignment, letter grade reduction, failure in the course, notation on the transcript, suspension.

Please Do Not Cheat, it is not worth it, and ultimately hurts your learning.

Student Accessibility

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 Student 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 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:

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

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

- **Students Registered with Student Accessibility Services:** please email your letter to yisheng@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 two 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 period, 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 <https://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-and-or-harassing-behaviour-in-academic-situations-senate-policy/>

Lecture Schedule

	Date	Lecture Content
1	Feb 18	Course introduction, learning goals & expectations Fundamentals of protein structure <i>Hand on session: Analysis of protein primary structure</i>
	Feb 25	Reading week
2	Mar 4	Analysis of protein secondary/tertiary structure <i>Hand on session: Introduction to Pymol</i>
3	Mar 11	Analysis of protein interactions <i>Hand on session: Analysis of protein interactions using Pymol</i>
4	Mar 18	Techniques used for protein analysis <i>Hand on session: Summary report on structural analysis of your assigned protein</i>
5	Mar 25	No class
6	Apr 1 and Apr 8	Apr 1 - Team 1 & 3 Oral presentation Team 2 & 4 poster Apr 8 – Team 2 & 4 Oral presentation Team 1 & 3 Poster