

## **BIOC12H: Biochemistry I: Proteins and Enzymes Fall 2015**

### **Description**

This course will cover the general structure and function of macromolecules occurring in living organisms. However, the focus will be on the structure and function of proteins and the special class of proteins: enzymes. The analytical methods for proteins will also be discussed. Topics will include: amino acids; the primary, secondary, tertiary and quaternary structures of proteins; protein motifs and protein domains; glycoproteins; membrane proteins; classical enzyme kinetics and allosteric enzymes; mechanisms of enzyme action.

**Prerequisites:** CHMB41 and CHMB42 and [BIOB10H & BIOB11H] /BIOB10Y

### **Class Meetings**

Monday 13:00-15:00 SY110

Wednesday 11:00-12:00 HW216

### **Instructor**

Dr. Rongmin Zhao

Office: SY248

Email: [rzhao@utsc.utoronto.ca](mailto:rzhao@utsc.utoronto.ca)

Please use E-mail ONLY when it is critical for you to get in touch with me and use BIOC12H-Biochemistry in the subject line. Also your student name and student number must be included in your email.

### **Office Hours**

Instructor office hours (SY248):

Monday 3:00-5:00pm; or the time by appointment

### **Teaching Assistant**

There is one teaching assistant (Anh Cao) for the course. The TA will hold office hours after term tests to answer questions related to the term test. The schedule of TA office hours will be announced on the course website.

### **Lecture Materials**

The University of Toronto Blackboard system will be used to support the course. You can log in from the website <https://portal.utoronto.ca/webapps/portal/frameset.jsp> with your UTORid. Lecture note will be posted in the Blackboard prior to the lecture. I will try to post the lecture notes either Friday or Saturday before the lecture week. However, lecture notes only allow you to follow the lectures easily and materials discussed in lectures may not show up in the lecture notes but they will be included in the tests. Any important information related to this course will be announced in the Blackboard and you are supposed to check the announcement regularly.

## WebOption

Lectures will be posted online for two weeks only. NO lecture will be re-posted before the final exam. In case that you miss a lecture, you should arrange to view the lectures online within two weeks from the lecture date.

## Textbooks

I ordered the textbook **Biochemistry** by **Garrett et al.**, the First Canadian Edition (2013), Nelson (available in the bookstore). This Canadian Edition includes many well documented Canadian research data and some of them are included as “A Deep Look” or boxed highlights. However, if you by chance have a copy of the non-Canadian version Biochemistry by Garrett et al., it is OK. The textbook comes with a solution manual and it is helpful to do example questions from the end chapter problem sets. The textbook will also serve as a reference book for your future study on relevant courses or research. It should be noted that many biochemistry textbooks cover similar topics and they all provide valuable explanation on certain concepts. These textbooks include but not limited to Biochemistry: the molecular basis of life, by McKee and McKee; Biochemistry: by Voet et al.; Biochemistry: by Berg et al.; Principles of Biochemistry: by Horton or Moran et al.

However, **ONLY** materials covered in lectures or assigned to read will be tested. Therefore attendance to lectures is highly recommended.

## Course Evaluation

Term Test 1 — 20%

Term Test 2 — 25%

Final exam — 55%

All tests will be focused on concepts and the mechanism of processes. The test may include calculation and graphing questions, explanation of processes and interpretation of terms.

**Term Test 1:** The first term test will cover materials from the first three lectures. The format will be multiple choice and short answer questions. It is a 2-hour test probably during the 5<sup>th</sup> week. The exact time and location will be announced later.

**Term Test 2:** Test materials covered in Lectures 4-7. It is also a 2-hour test probably in the 9<sup>th</sup> week and the time and location will be announced later. It will be also multiple choice and short answer questions.

**Policy on Term Tests:** They are both closed book tests. Although term test 2 will cover materials for lecture 4-7, you have to realize that to properly answer questions in Term Test 2, you need the knowledge from the first three lectures. There is no makeup term test. If you miss Term Test 1 because of sickness, you have to show me a valid UTSC medical certificate (available on the registrar's site) and I will determine if the 20% mark can be combined to the second test. If you miss the second test because of sickness, you have to show me the valid UTSC medical certificate and I will determine if the mark of Term test 2 can be combined to the final exam. Missing both term tests is not allowed unless under extremely special circumstances. If this is the case, Term test 1 will be treated as 0 and the second term test will be combined to final exam.

**Final exam:** The schedule of the final exam will be arranged by the Registrar's office. The format will be similar to term tests but will be cumulative. It will cover materials from the beginning. However, emphasis will be on materials from lecture 8 to lecture 12. Students who miss the final exam must contact the Registrar's Office for appropriate arrangement.

## **Information Regarding AccessAbility Services at UTSC**

Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability/health consideration that may require accommodations, please feel free to contact with me and/or the AccessAbility Services Office as soon as possible. The UTSC AccessAbility Services staff (located in Room SW-302) are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations. You can contact AccessAbility Services at 416-287-7560 or [ability@utsc.utoronto.ca](mailto:ability@utsc.utoronto.ca).

## **Academic Integrity**

Academic integrity is essential to the pursuit of learning and scholarship in a university, and to ensuring that a degree from the University of Toronto is a strong signal of each student's individual academic achievement. As a result, the University treats cases of cheating and plagiarism very seriously. The University of Toronto's Code of Behaviour on Academic Matters (<http://www.governingcouncil.utoronto.ca/policies/behaveac.htm>) outlines the behaviours that constitute academic dishonesty and the processes for addressing academic offences. Potential offences include, but are not limited to:

- **IN PAPERS AND ASSIGNMENTS:** Using someone else's ideas or words without appropriate acknowledgement; submitting your own work in more than one course without the permission of the instructor; making up sources or facts. Obtaining or providing unauthorized assistance on any assignment.
- **ON TESTS AND EXAMS:** Using or possessing unauthorized aids; looking at someone else's answers during an exam or test; misrepresenting your identity.
- **IN ACADEMIC WORK:** Falsifying institutional documents or grades; Falsifying or altering any documentation required by the University, including (but not limited to) doctor's notes.

All suspected cases of academic dishonesty will be investigated following procedures outlined in the Code of Behaviour on Academic Matters. If you have questions or concerns about what constitutes appropriate academic behaviour or appropriate research and citation methods, you are expected to seek out additional information on academic integrity from your instructor or from other institutional resources (see <http://www.utoronto.ca/academicintegrity/resourcesforstudents.html>).

**Tentative Lecture Schedule**

The topics covered are listed here. However, this is only a tentative schedule. The order may be changed later.

Lectures	Monday of the Week	Topics	note
	Aug 31	No class	Course syllabus and Lecture 1 note posted
1	Sept 7	Introduction, basics of biochemistry, water, buffer, pH control, thermodynamics	First class on Sept 9 <sup>th</sup> Please double check your prerequisite for this course
2	Sept 14	Amino acids, protein primary structure	Sept 17, last day to add F and Y courses.
3	Sept 21	Protein analysis	
4	Sept 28	High orders of protein structures	
5	Oct 5	High order of protein structures, protein analysis	<b>Term test 1 on lectures 1-3</b>
	Oct 12	No class	Oct 12-Thanksgiving Day and reading week.
6	Oct 19	Protein folding and diseases	
7	Oct 26	Important proteins	
8	Nov 2	Carbohydrate and glycoproteins	
9	Nov 9	Lipid and membrane proteins	<b>Term test 2 on lectures 4-7</b>
10	Nov 16	Enzyme kinetics	Nov 19, last day to drop F courses without academic penalty
11	Nov 23	Mechanism of action of Enzymes	
12	Nov 30	Regulation of enzyme activity	
	Dec 2 (Wednesday)	Last class for this course	<b>Final exam is cumulative</b>