

# **BIOL 2020/BCHM 2020 - Biochemistry**

## **BIOL2020 Fall 2013 Course Outline**

**Lecturer:** Dr. Terry Kubiseski, room 329C LSB

416-736-2100 x 40519

**Office hours:** Tues & Thurs 12:30 to 1:30 pm, Rm 213 LSB

**e-mail:** tkubises@yorku.ca

**e-mail policy:** I will **try** to respond within one working day, or answer your question at the next class meeting if appropriate. Questions and answers of interest to the entire class will be posted on the class website. ***PLEASE*** include a brief and descriptive subject line in your email.

### **Required text:**

1. McKee and McKee: Biochemistry: The Molecular Basis of Life. (2010) 5th ed., Oxford publishing.

### **Optional supplementary text:**

1. Tymoczko, Berg and Stryer: Biochemistry: A Short Course. (2010) 1st ed., Freeman Publishing.

2. Alberts *et al.* (2008) *Molecular Biology of the Cell*, 5th ed., Garland Publishing.

3. Boyer (2006) *Concepts in Biochemistry*, 3rd ed. Wiley Publishing.

**Course website:** Located at moodle.yorku.ca and will include PDF file of slides presented before lectures and audio stream after lectures.

**Lectures:** Tuesday, Thursday: 8:30 am - 10:00 am, CSE A

**Mid-term exam dates:** October 8 and November 12, 2013.

The following topics will be covered in lecture although there may be alterations at the discretion of the course director. Lecture material will be posted online. The Buffers section of the course is not covered well in textbooks so I've posted readings on the course website. Students are responsible for all material covered in the lecture.

### Course Outline

Section	Topic	Reading (McKee and McKee)
Section 1: Buffers, amino acids and protein structure	Introduction, chemical bonds	Chapters 1, 3
	Water, acids, bases, buffers	Chapter 3
	Amino Acids	Chapter 5
	Protein Structure (secondary)	
	Protein Structure (tertiary) and Hemoglobin structure/function	
	Enzyme Kinetics and Inhibition	Chapter 6
Section 2: DNA & RNA structure and molecular biology techniques	Carbohydrates	Chapter 7
	DNA & RNA structure	Chapter 17
	DNA replication and repair	Chapter 18
	DNA transcription	
	Regulation of gene expression	
	Protein Synthesis	Chapter 19
Section 3: Metabolism	Metabolism and energy transfer	Chapter 4, 8
	Glucose metabolism: glycolysis and gluconeogenesis	Chapter 8
	Oxidation of pyruvate, citric acid cycle	Chapter 9, 10
	Oxidative phosphorylation and electron transport	
	Metabolism of fatty acids and amino acids	Chapter 11, 12, 14
	Coordination of metabolism	Chapter 16

Section 1 will be tested on Midterm 1 (October 8th).  
 Section 2 will be tested on Midterm 2 (November 12th).  
 Final Exam is a cumulative exam, with emphasis on Section 3.

This second year course will focus on a wide range of topics within Biochemistry. In order to fully understand the material presented during lecture, a basic understanding of chemical principles and cellular molecular biology (i.e. BIOL 1010, CHEM 1000 & 1001) will be expected of candidate students. Although most of the curriculum can be found in the course recommended text, **certain topics, such as the practical application of several biochemical techniques, will NOT be found in the text.** Thus, in order to be as successful as possible, each student should attempt to be present for all lectures. Students are also encouraged to consult additional references sources (e.g. biochemistry books on reserve in the library, as listed below.)

Chapters correspond to McKee and McKee, Biochemistry. Coverage of chapters will not be complete, and where indicated the lectures will cover only selected topics from the chapter. Students are advised to attend all lectures and study those sections of the text relevant to the lecture topics. Exam questions will relate to the lecture topics and any related information presented in the lectures that may not be covered in the textbook. Students are encouraged to search for other reference material that complements the lectures.

### **Assignments and Grading:**

Mid-term tests → 40% (20 % each)

Final exam → 60%.

This course emphasizes ***the ability to apply knowledge gained in BIOL2020.*** As a consequence, testing will focus on situations and the ability of the student to analyze data and anticipate outcomes. Again, the critical thinking required by the student would be strengthened by attending all lectures. In order to ***EARN*** an “A” in this course, students must demonstrate the ability to apply their knowledge.

### **Test/Exam format:**

Tentatively: Exams will be multiple-choice, approx. 30 questions on each midterm and 75 questions on the final exam. It is possible that there will be some fill in the blanks and short answer questions as well.

**Midterms:** If a mid-term is missed with a valid excuse and documentation (e.g. illness with a doctor’s note), the weight will be transferred to the final exam.

**You must contact the course director within two days of the midterm exam and present valid documentation (*the note must state that you were unable to be present for the test/exam and not that you were seen by the Doctor*) within one week of the exam to qualify for exemption.**

**Deferred final exam:** If you miss the final exam with a valid excuse and documentation, you must fill out a Deferred Standing Agreement Form (see the Biology Undergraduate Office) as soon as possible after the exam and have it signed by the course director. Make-up exams will be given during the Biology deferred exam period in the spring of 2012. The format of the make-up exam for this course may be essay and/or multiple-choice. ***If midterm and exam are missed for any reason, the student cannot pass BIOL2020 since testing would not have occurred in a timely fashion and would not be a true measure of the students' ability to acquire knowledge of the material.***