This syllabus is a general representation of the course as previously offered and is subject to change.

BIOL 201 – Introduction to Biochemistry

General Course Syllabus (as of August 2019)

About the Course:

Course Description: Topics include biological molecules, protein structure and enzyme action, energy transfer, central metabolic pathways and their regulation. Examples are drawn from plants, animals and microorganisms. (Consult the Credit Exclusion list within the Faculty of Science section of the Calendar.) Credit will be granted for only one of BIOL 201, BIOC 202, or BIOC 203.

Course Format: Lecture and Tutorial
Credits: 3
Prerequisites: BIOL 200, and one of CHEM 233 or CHEM 260.
(or BIOL 200 and corequisite of CHEM 213; or a corequisite of either CHEM 313 or CHEM 330)
(or BIOL 200 and CHEM 203 is also acceptable – please speak to the course coordinator).

Course Learning Objectives:

By the end of this course, students should be able to:

- Demonstrate understanding of the chemistry underlying the following biological processes:
    - pH-dependent behavior of molecules and their functional relevance under biological conditions.
    - Protein folding, function and kinetics.
    - The biochemistry behind Energy Transformations.
    - Metabolism.
- Demonstrate understanding of protein structure and its importance in protein function.
- Solve problems related to biochemistry by Integrating and applying knowledge of Chemistry and Biology.
- Describe and interpret experimental data based on conceptual knowledge of chemistry and biology.
- Articulate the interdisciplinary nature of biochemistry within the context of the 'bigger picture' of everyday life.

Textbooks and Additional Resources:

COURSE WEBSITE:
BIOL201 will be running on Canvas. For more information and access to the website, see: http://lthub.ubc.ca/guides/canvas/. Requires UBC CWL and password for access.

TEXTBOOK:

Nelson DL & Cox MM (2017). Lehninger, Principles of Biochemistry, 7th Edition. WH Freeman & Company, New York. (See UBC Bookstore for other purchase options)

An access code to Sapling Plus (the online companion to the textbook) is REQUIRED for this course – it provides access to the following:

- **e-textbook**
- weekly **targeted reading guides**, videos and other supplemental materials
- weekly **pre-reading quizzes**

PROBLEM SETS:
Problem sets have been developed for topics associated with each unit of the course. These will be posted on Canvas at the start of each Unit (see weekly schedule for details).

I>CLICKER - CLASSROOM RESPONSE SYSTEM:
Available at the UBC Bookstore. iClickers will be used in every lecture, as an interactive assessment tool to evaluate students' level of knowledge based on prior learning, to evaluate comprehension of reading assignments, and to gauge conceptual understanding after most in-class activities.

Piazza: Online discussion platform for the course – can be accessed via the course Canvas site.

Evaluation:

Assessment	Weight
Examinations:*	
• Exam 1 (Midterm)	32%
• Exam 2 (Final)	50%
Learning Activities:*	
• Pre-Reading Quizzes (10 x 0.5%)	5%
• Scheduled Tutorials (4 x 1%)	4%
• In-class Participation	9%

Note: To pass this course, students must achieve 50% on the aggregate score of the midterm and the final. The learning activity components will only be applied to the final grade once a 50% is achieved on the exams.

DETAILS ON ASSESSMENTS:

Exams: Exams I and II test different content (Exam I on Units 1, 2, and 3A; Exam II on Units 3B, 4, and 5), meaning that the final exam is NOT cumulative and both Exam I and Exam II are mandatory. Both Exams I and II will contain a combination of questions, including short answers, problem solving with calculations, data analysis, T/F, fill-in the blanks, and the occasional multiple-choice question. Direct recall of memorized information is not the goal of BIOL 201. Students will be provided with "reference material" for both Exam I and II, which will include formulas, molecular structures and other information that will help to work through the exam questions.

Pre-Reading Quizzes: consists of weekly quizzes on Sapling Plus, based on Targeted Pre-Reading Guides. The best of 10 of 11 (or 12) quizzes will be counted.

Tutorials: Students need to be registered in a tutorial section. There are two types of tutorials in the course:

1. **Drop-in Tutorials:** held weekly, TAs and/or Peer Tutors will be available (9am to 5pm, Mondays to Thursdays) to help with problem sets and course materials on a drop-in basis. It is recommended that students attend their regular tutorial time slot, but they may choose to attend at any time.

2. **Scheduled Tutorials:** there are FOUR scheduled tutorials during the term (Weeks 3, 4, 8 & 9 - see schedule).
   - Purpose: to provide students exposure to some of the more complex and routinely used experimental methods in biochemistry, in small group settings. These tutorials have been designed to provide students practice on working with data generated and solving problems using these methods.
   - In each Scheduled tutorial, TAs will facilitate discussion of the topic of the day. Students will have the opportunity to work in groups to complete a worksheet.
   - Each tutorial is worth 1% of the final grade. Active participation and engagement with problem solving will be assessed to achieve these marks.
   - During the weeks of scheduled tutorials, limited drop-in hours will be made available.

In-class participation: is based on iClicker use (~2%) and other in-class activities including, worksheet, pre-assigned homework (~7%), and at the discretion of the section instructor. The Problem Sets and Homework have been explicitly designed to expose students to problem-solving of types similar to those on the exams.

Schedule of Topics:

This course consists of 5 units, each covering a topic area of biochemistry (See table below for a sample schedule from 2018W2, subject to change):

Week	Lecture Topics	Tutorial Week
1-2	**Unit 1: Aqueous Ionization Tendencies** - Introduction to Biochemistry - Aqueous Ionization - Ionization Tendencies of different groups - Intro to the predominant species (PS), the average molecule (AM), and the isoelectric pH (pI)	Problem set #1
2-4	**Unit 2: Proteins** - 2A: Aspects of globular protein structure - 2B: Protein Folding & Common Experimental Tools	Problem set #2 Tutorial 1 (Week 3) Problem set #3 Tutorial 2 (Week 4)
5-8	**Unit 3: Enzymes** - 3A: Mechanism of Enzyme Catalysis - 3B: Enzyme Kinetics & Inhibition	Problem set #4 & 5 Tutorial 3 (Week 8) **Midterm – Exam 1**
9-11	**Unit 4: Energy Transfer** - 4A: The basics + ATP usage in biosynthesis - 4B: Mechanism of ATP synthesis	Problem set #6 Tutorial 4 (Week 9) Problem set #7
12-14	**Unit 5: Metabolism** - 5A: Universal Catabolic Pathways - 5B: Plant-Specific (Anabolic) Pathways - 5C: Regulation of Metabolism	Problem set #8 & 9
		Final – Exam II

Course Policies:

- **Students are expected to consult both the Canvas and Sapling Plus sites regularly**, to keep informed of any announcements and/ or changes. Note that the primary site for the course is Canvas. Students should be able to access Piazza, the course discussion forum, through the Canvas portal.
- **The course instructors, the University of British Columbia, and MacMillan Learning hold copyright** over the course materials, presentations and lectures which form part of this course. No audio or video recording of lectures or presentations is allowed in any format, openly or surreptitiously, in whole or in part without explicit written permission of the instructor. Course materials (both paper and digital) are for the participant's private study and research, and not for resale to any other individuals, companies, or websites.
- **Tutorials:** Students are expected to attend the tutorial that they've registered in.

University Policies:

UBC provides resources to support student learning and to maintain healthy lifestyles but recognizes that sometimes crises arise and so there are additional resources to access including those for survivors of sexual violence.

UBC values respect for the person and ideas of all members of the academic community. Harassment and discrimination are not tolerated nor is suppression of academic freedom.

UBC provides appropriate accommodation for students with disabilities and for religious, spiritual and cultural observances.

UBC values academic honesty and students ae expected to acknowledge the ideas generated by others and to uphold the highest academic standards in all of their actions.

Details of the policies and how to access support are available on the UBC Senate website.