



Biochemistry | Lecture and Lab

Academic Year 2020-2021

Course Information

Course Numbers

BIO322/BIO322L

Total Credits

4 (3 Lecture + 1 Lab)

Time Requirement

75 hrs (Lecture 45hrs + Lab 30hrs)

Course Details

Organic Chemistry I and II are highly recommended

Course Description

Biochemistry examines the structure and function of the following biological macromolecules in the context of cellular integrity, dynamics and metabolism: carbohydrates, lipids, proteins and nucleic acids. The weekend biochemistry topics include enzymology, bioenergetics, catabolism, anabolism, regulation of gene expression, biotechnology, and hormone regulation of mammalian metabolism and the pre-biotic evolution of life on earth. This course is designed to enhance, deepen, and further integrate knowledge of the subject by developing different problem-solving skills and conceptual organization. This course will serve as an extension of organic chemistry, in that a thorough understanding of bio-macromolecules will be achieved. The structure, function, and mechanism of polymerization will be investigated as pertains to proteins, carbohydrates, and nucleic acids. Metabolic processes will be studied, including glycolysis, the citric acid cycle, electron transport and oxidative phosphorylation. A goal will be to comprehend these complex biochemical processes with a rigid mechanistic approach, like that of organic chemistry.

Lecture and Laboratory Communication

A website will be set up on Canvas by your instructor.

Log in with your Username and password: <https://scuhs.instructure.com>

Faculty Information

Refer to the Canvas course webpage for this information.

Class Meeting Times

Refer to Canvas course webpage for this information.

Instructional Materials

Required Text(s)

Lecture: General, Organic, and Biochemistry by Katherine J Denniston 10th edition(Connect©)

Lab

Biochemistry Lab Manual available on Canvas course webpage.



Course Purpose

Student Learning Outcomes

At the conclusion of this course, a successful student should be able to:

1. Demonstrate thorough knowledge and understanding of the fundamental principles and core concepts of Biochemistry.
2. Apply their knowledge to appraise scientific and technical literature in the field of Biochemistry
3. Assess problems in the field of Biochemistry and develop solutions or strategies to solve those problems based on logic and the knowledge acquired during this course.
4. Professionally construct and express their ideas, thoughts, and concepts in Biochemistry through written and verbal communication.

Course Learning Objectives: Please refer to the appendix for a full list of course objectives.

Course Schedule (subject to slight modifications by the instructor)

(subject to slight modifications by the instructor)

Week	Lecture	Assessment
1	Module 1: Carbohydrates	Reading Assignment, Module Quiz, Practice Exam 1
2	Module 2: Lipids and their Functions in Biochemical Systems Module 3: Protein Structure and Functions	Reading Assignment, Module Quiz, Practice Exam 2
3	Module 4: Enzymes Module 5: Introduction to Molecular Genetics	Reading Assignment, Module Quiz, Practice Exam 3
4	Module 6: Carbohydrates Metabolism Module 7: Aerobic Respiration and Energy Production	Reading Assignment, Module Quiz, Practice Exam 4
5	Module 8: Fatty Acid Metabolism	Reading Assignment, Module Quiz, Practice Exam 5

Tentative Grading Procedures

Lecture

Assignment	Total assignments	Points per assignment	Total points	Percentage
Reading Assignment	8	10	80	8%
Check your Understanding	8	25	200	21%
Homework	8	20	160	17%
Weekly Exams (30-50 questions)	5	100	500	52%
Remote Exam Proctoring orientation	1	10	10	1
Total			950	100%

Lab Schedule

(subject to slight modifications by the instructor)

Laboratory	Assessment
Check-in: Check in/safety/glassware	Lab notebook
Worksheet	
Experiment 1 Amino Acids paper Chromatography	Lab notebook
Experiment 2: Acids, Bases, pH and Buffers	Quiz 1
Experiment 3: Analysis of Lipids	Lab notebook
Experiment 4: Enzymes	Lab notebook Quiz 2
Experiment 5: Test for Carbohydrates	Lab notebook
Experiment 6: Analysis of Urine	Lab notebook Quiz 3
Experiment 7: Spectroscopic Analysis of Beta –Carotene	Lab notebook
Experiment 8: Spectrophotometric Analysis of β-Carotene	Lab notebook
Review	Quiz 4

Tentative Grading Procedures

Assessment	Points	Weight (%)
Lab Quizzes (4 x 50 points)	200	52
Lab Notebook (2 x 80)	160	42
Participation	5	1
Worksheet	20	5
Total	385	100



Grading scale:

Please note letter grades will be assigned only at the end of the trimester.

A = 90% to 100%

B = 80% - less than 90%

C = 70% - less than 80%

D = 60% - less than 70%

F = less than 60%

W = Withdrawal

Grading procedures:

The format of assessments may include multiple choice, short answer, labelling, fill-in-the-blank, or matching examinations. Participation points are required and will be assigned by the instructor as the course progresses through the use of any of the following: in class mini quizzes, activities, kahoot online quizzes (www.kahoot.it). For online quizzes students must have a phone, tablet, laptop or other internet connected device to participate. Students must be in class during the participation activities to receive participation marks.

Academic Integrity

Visit SCU's [Academic Integrity](#) page to review policies for professionalism and academic integrity.



Teaching Methods and Activities

The course will follow a linear format, meaning you will complete all of the modules in sequence. The material in each module will include a combination of readings, videos, homework, and other exercises. You'll also complete an exam at the end of each module. You can read about each of the course components below. Each module takes about 5 hours to finish.

Introduction: The introduction page goes over the content covered in each module. It outlines the learning objectives and related learning activities. Reading the Introduction will help you identify the central concepts of the module and connect what you will learn to the broader context of the course.

Key Points: Key points contain videos or other interactive assignments related to some of the most important or interesting topics in the chapter. The modules are filled with key point videos. Some videos show fun applications. Some videos are conceptual, and some videos are designed to help you master the calculations in this course.

Lecture Outline: The lecture outline is essentially a series of PowerPoint slides on the most important chapter topics that you should review before you begin the Reading Assignment. These slides will also serve as a good reference when completing homework and reviewing for exams.

Reading Assignment: Read the assigned sections in the chapter fully and complete any activities embedded in the LEARNSMART reading assignment. Reading time will vary from module to module.

Homework: Homework problems are reflective of the type questions that will be on the Exams. Remember, there is a difference between completing chemistry related word problems with access to help (book, instructor office hours, tutor, Google, etc.) versus completing problems on your own. It is okay and encouraged to use all available resources to learn how to complete a certain type of chemistry problem. However, the long-term goal should be obtaining the ability to complete Exam problems without any aid. First homework must be done using Tegrity.

Check Your Understanding Quizzes: On Check Your Understanding pages, you will practice the module content you've covered using interactive study tools. These interactive study tools will help you assess your progress and identify areas for improvement. Additionally, interactives give you an opportunity to review and apply information presented in your course and in the online textbook before taking quizzes or high-stakes exams.

Exams: There will be one exam per week. There will be questions that are similar to the homework. The Exams are all on Connect. Please pay attention to the due dates. They are final and will not be extended. Exams are on Canvas platform. You must use Tegrity to proctor your exams. You need to have both video and audio on. The recording should be initiated prior to starting the Exam and ends after finishing the test. Your face should be in the field of view. All other programs need to be close on your computer. Cell phones must be turned off before the beginning of the Exams. Make sure you have enough memory on your computer.

Remote Exam Proctoring orientation: A 10-20 minute test proctoring video must be submitted by Tuesday 11:59 following the first day of class. You can record yourself while completing the first



homework. It is incredibly crucial that you provide this video to ensure your computer is working correctly and to confirm your presence in the course. **Students who do not verify their presence will be dropped from the course.**

Best Practices for Studying Biochemistry

- Read before and read after each class. Skim the chapter before it is covered in lecture to become comfortable with some of the terms associated with each topic. Review each chapter after it is covered in class to enhance your understanding of what was covered in class.
- Participate during class by taking notes during class and looking over them afterwards. Don't skip class, arrive late, or leave early. Ask questions for clarification when you don't understand the material.
- Stay on top of the homework and assignments. Do the assigned problems as close to the time as when the topic is covered in the class to increase the depth of your understanding of specific concepts and will help you learn the material more efficiently and effectively.
- Do not wait until the night before the homework is due to start the assignment. You will get more out of it if you take the time to really learn the concepts and review the material without being rushed.
- Find a group of students to study with. Seek out students dedicated to doing well in the course. This makes studying more fun and helps you learn the material better by teaching what you know and learning from your peers what you don't know. Explaining these concepts to others will help you learn the material even better.
- Stay focused by finding an environment where you can study with few distractions.

University Policies

Accommodations

As a learning-centered community, Southern California University of Health Sciences recognizes that all students should be afforded the opportunity to achieve their academic and individual potential. The University recognizes and supports the standards set forth in Section 504 of the Rehabilitation Act and

the American with Disabilities Act (ADA). In accordance with its mission and federal and applicable state laws, the University is committed to making reasonable accommodations for qualified applicants for admission and enrolled students with disabilities. A student who needs accommodation(s) due to a disability should contact the Academic Support Office located in the Learning Resource Center.

Faculty and Dr./Patient Relationships

SCU faculty are highly skilled. However, per University Policy, health care is offered to students through the University Health System only. Neither preclinical nor clinical faculty can provide advice, assessment, treatment, or other elements that would be considered part of a Doctor-Patient relationship outside of a clinical setting established for that purpose.



Learning Activities

Students are expected to spend at least two hours for each lecture hour of course time per week in activities and assessments outside the classroom. Examples of activities include, but are not limited to: writing papers; reading articles or text; small group work; presentations; completing assignments; preparation for assessments; online activities and other activities that do not include direct instructor interaction and involvement.

All university policies apply to this course and all others. For full policy information please consult the university SCU Policy Manual. For a quick reference guide to the following policies: make-up examination, F-challenge examination, grade posting, results of failing grades, student support information, syllabus amendments, special needs, student conduct, and attendance, please consult the academic policies document housed on the [Online Student Services](#) .