

Biochemistry and Molecular Biology
Biological Sciences 312
Lecture Syllabus, Spring 2016

Lectures: Monday, Wednesday and Friday 9:00-9:50 a.m., Room MRF 340

Instructor:

Christa Bancroft, Ph.D.

Office: ZHS470

Office hours: Tuesday and Thursday, 11:00-12:00 p.m.

Email: cbancrof@usc.edu

Recommended Preparation: BISC 220/221

Course Objectives: The student will learn the structure and function of biological macromolecules: DNA, RNA, proteins, lipids and carbohydrates. We will study cellular metabolism and energy production pathways, including glycolysis, the Citric Acid cycle, oxidative phosphorylation, gluconeogenesis, and the pentose phosphate pathway. Students will gain an understanding of how these systems are all controlled via hormone regulation. We will also learn how DNA, RNA and proteins act to copy, express and accurately transmit genetic information, specifically the mechanisms of: DNA replication, transcription, translation, DNA repair, recombination and gene regulation. Techniques used to study molecular biology and biochemistry will be presented in the context of these major biological mechanisms.

Textbook: Appling, Anthony-Cahill, Mathews, Biochemistry: Concepts and Connections (2015, 1st edition), plus Pearson, Mastering Chemistry on-line learning program. Can be purchased as a package in the bookstore, along with e-textbook, or separately.

Course Grades:

The course grade will be based upon **640** possible points:

150 pts. Midterm 1

150 pts. Midterm 2

150 pts. Final Exam

40 pts. Blackboard quiz questions (from at-home lecture content)

150 pts. Discussion (Students must purchase the Pearson Mastering Chemistry on-line program associated with the textbook to participate in Question/Answer sessions during class and for homework assignments.) Course ID: BANCROFT312S2016

Wk.	Date	Lecture Topic	Reading
1	Jan. 11	Intro to Biochemistry and the Language of Chemistry	Ch. 1
	Jan. 13	Chemical Foundations of Life	Ch. 2
	Jan. 15	Energy in Biochemistry	Ch. 3
2	Jan. 18	No lecture, MLK Day	
	Jan. 20	Nucleic Acids	Ch. 4
	Jan. 22	Amino Acids and Analysis	Ch. 5
	Jan. 25	Amino Acids and Analysis	Ch. 5

3	Jan. 27	Protein Structure and Biochemical Methods	Ch. 6
	Jan. 39	Protein Structure and Biochemical Methods	Ch. 6
4	Feb. 1	Enzymes	Ch. 8
	Feb. 3	Enzymes	Ch. 8
	Feb. 5	Enzymes	Ch. 8
5	Feb. 8	Enzymes	Ch. 8
	Feb. 10	Carbohydrates	Ch. 9
	Feb. 12	Midterm 1	
6	Feb. 15	No lecture, President's Day	
	Feb. 17	Lipids, Membranes and Cellular Transport	Ch. 10
	Feb. 19	Lipids, Membranes and Cellular Transport	Ch. 10
7	Feb. 22	Principles of Metabolism	Ch. 11
	Feb. 24	Carbohydrate Metabolism	Ch. 12
	Feb. 26	Carbohydrate Metabolism	Ch. 12
8	Feb. 29	Carbohydrate Metabolism	Ch. 12
	Mar. 2	Carbohydrate Metabolism	Ch. 12
	Mar. 4	TCA Cycle	Ch. 13
9	Mar. 7	TCA Cycle	Ch. 13
	Mar. 9	Electron Transport and Oxidative Phosphorylation	Ch. 14
	Mar. 11	Electron Transport and Oxidative Phosphorylation	Ch. 14
10	Mar. 14	No lecture, Spring Break	
	Mar. 16	No lecture, Spring Break	
	Mar. 18	No lecture, Spring Break	
11	Mar. 21	Electron Transport and Oxidative Phosphorylation	Ch. 14
	Mar. 23	Electron Transport and Oxidative Phosphorylation	Ch. 14
	Mar. 25	Lipid Metabolism	Ch. 16
12	Mar. 28	Midterm 2	
	Mar. 30	Metabolic Control and Hormone Regulation	Ch. 17
	Apr. 1	Metabolic Control and Hormone Regulation	Ch. 17
13	Apr. 4	Metabolic Control and Hormone Regulation	Ch. 17
	Apr. 6	Signal Transduction	Ch. 20
	Apr. 8	The Genome	Ch. 21
14	Apr. 11	DNA Synthesis	Ch. 22
	Apr. 13	DNA Synthesis	Ch. 22
	Apr. 15	DNA: Repair and Recombination	Ch. 23
15	Apr. 18	Gene transcription	Ch. 24
	Apr. 20	Gene transcription	Ch. 24
	Apr. 22	Translation: Protein Synthesis	Ch. 25
16	Apr. 25	Translation: Protein Synthesis	Ch. 25
	Apr. 27	Gene Regulation	Ch. 26
	Apr. 29	Gene Regulation	Ch. 26
	May 6	Final Exam: 8-10 a.m.	

In case a midterm exam must be missed for legitimate reasons, discuss the situation with the course instructor **prior** to the exam, if possible. If an exam is missed for an

emergency or for a valid health reason (with written documentation), the scores of the other two exams will be prorated to comprise your total point score. Rules governing exams are given in more detail in your Student Contract, which is also posted on the class website: <https://blackboard.usc.edu>.

In the event an error is made in the grading of your exam, written submittal of a description of the error with the exam should be returned to Dr. Bancroft within a week after receiving your graded exam. After this time period, exams will not be regraded.

Lectures: It is important to attend all of the lectures during the course and to take good notes for study. Prior to attending each lecture, it is important to have read the appropriate portions of the textbook. However, many of the lectures will contain new and additional information that is not in the textbook. Examinations will be based mainly on information given in the lectures. In studying for examinations, complete and accurate lecture notes are of prime importance.

The lecture slides posted on the course Blackboard internet site (<https://blackboard.usc.edu>), may contain material that is not in the lectures—and the lectures may contain information that is not conveyed in the Blackboard lecture summaries. The lecture slides, as posted on Blackboard, and the textbook are intended to be helpful, but auxiliary to the lectures. All course material, information, announcements and grades will be posted on Blackboard until the end of the semester.

Lectures **3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36 and 39** will have an audio section that should be read and listened to at home before coming to lecture that day. There will be quiz questions on Blackboard associated with the at-home portion of the lecture. These lecture are labeled in **BOLD** on the syllabus

Email Communication:

To ensure privacy, only student's USC email accounts may be used for email communications. Students are responsible for understanding the content of email messages that the instructor sends to their USC accounts. Therefore, each student must check their USC email regularly and make sure their account is not over quota, so new messages can be received.

Statement on Academic Conduct and Support Systems

Academic Conduct

Plagiarism – presenting someone else's ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in *SCampus* in Section 11, *Behavior Violating University Standards* <https://scampus.usc.edu/1100-behavior-violating-university-standards-and-appropriate-sanctions/>. Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, <http://policy.usc.edu/scientific-misconduct/>.

Discrimination, sexual assault, and harassment are not tolerated by the university. You are encouraged to report any incidents to the *Office of Equity and Diversity* <http://equity.usc.edu/> or to the *Department of Public Safety* <http://capsnet.usc.edu/department/department-public-safety/online-forms/contact->

[us](#). This is important for the safety whole USC community. Another member of the university community – such as a friend, classmate, advisor, or faculty member – can help initiate the report, or can initiate the report on behalf of another person. *The Center for Women and Men* <http://www.usc.edu/student-affairs/cwm/> provides 24/7 confidential support, and the sexual assault resource center webpage sarc@usc.edu describes reporting options and other resources.

Support Systems

A number of USC's schools provide support for students who need help with scholarly writing. Check with your advisor or program staff to find out more. Students whose primary language is not English should check with the *American Language Institute* <http://dornsife.usc.edu/ali>, which sponsors courses and workshops specifically for international graduate students. *The Office of Disability Services and Programs* http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.html provides certification for students with disabilities and helps arrange the relevant accommodations. If an officially declared emergency makes travel to campus infeasible, *USC Emergency Information* <http://emergency.usc.edu> will provide safety and other updates, including ways in which instruction will be continued by means of blackboard, teleconferencing, and other technology.

Statement For Students With Disabilities:

Students requesting academic accommodations based on a disability are required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP when adequate documentation is filed. Please be sure the letter is delivered to Dr. Bancroft as early in the semester as possible. DSP is located in STU 301 and is open 8:30am–5:00pm, Monday through Friday. The phone number for DSP is (213) 740-0776. For more information, please visit the following link:

http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.html