

## Molecular Biology - BISC 320L

Fall, 2014

Lectures are in THH 101: MWF 11:00-11:50 AM, and MWF 12:00-12:50 PM

Faculty: Robert Baker, Ph.D., Professor ([baker@usc.edu](mailto:baker@usc.edu)),  
Irene Chiolo, Ph.D., Assistant Professor ([chiolo@usc.edu](mailto:chiolo@usc.edu)),  
Angel Tabancay, Jr., Ph.D., Instructional Laboratory Manager ([tabancay@usc.edu](mailto:tabancay@usc.edu))

Office hours: Baker: Mondays, 9/1 through 10/13, 1:45-3:30 PM in RRI 121  
Chiolo: Mondays, 10/20 through 10/31, 2:30-4:30 PM in RRI 121  
Wednesdays, 11/03 through 11/21, 2:30-4:30 PM in RRI 321 (note: no office hours on Wed 11/26 due to thanksgiving holidays)  
Mondays, 12/01 through 12/08, 2:30-4:30 PM in RRI 121

Textbook: Molecular Biology of the Gene, Watson et al., 7<sup>th</sup> ed. (Earlier editions will be satisfactory for much of the information in this course).  
Readings from this text is assigned on the lecture schedule. *It is important to read the assignments prior to the corresponding lectures.*

The course grade will be based upon **400** possible points:

100 pts	Midterm #1
100 pts	Midterm #2
100 pts	Lab
100 pts	Final Exam

In case a midterm exam must be missed for legitimate reasons, discuss the situation with the course instructor **prior** to the exam, if possible. There is no extra credit offered for the course. Final letter grades are assigned on a curve, determined entirely by the total number of points earned on lecture exams and in the laboratory portion of the course. *No make-up exams will be given in this course.* If you miss an exam due to severe illness, you must present a valid medical excuse to the laboratory director within one week of the missed exam. If you have a valid excuse, your exam score will be prorated from the remaining two exams. Rules governing exams are given in more detail in your Student Contract, which is also posted on the class website: <https://blackboard.usc.edu>.

Lab Sections: Please see separate syllabus and lab manual. **There will be no lab meetings the first week of classes.**

Course Objectives: The intent of this course is to teach the structure and function of biological macromolecules, in particular nucleic acids (DNA and RNA) and proteins and how these molecules function in copying, expressing and accurately transmitting genetic information. The course focuses on: molecular structure, transcription (RNA synthesis), translation (protein synthesis), gene regulation, eukaryotic chromatin, DNA replication and repair, recombination and DNA rearrangements.

Lectures: It is important to attend all of the lectures during the course and to take accurate notes for study. Prior to attending each lecture, it is important to have read the appropriate portions of the textbook (Baker's and Chiolo's lectures) and the online Blackboard notes (Baker's lectures). 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. Thus, in studying for examinations, complete and accurate lecture notes are of prime importance.

The lecture summaries (Baker), and the slides (Chiolo) 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 or in the textbook. The lecture summaries and slides, as posted on Blackboard are intended to be helpful, but auxiliary to the lectures. It may be necessary to make some adjustments in the syllabus during the semester.

Date	Reading assignment	Topics covered
8/25-8/29	<b>Prof. Baker lectures</b> Chapters 1, 2	Molecular biology, the central dogma, genes, biotechnology, pharmaceuticals, medicine; chemical bonds and interactions; DNA, RNA, protein structures
9/1 9/3-9/5	No lecture Chapters 3, 4, 5, 6, 13	DNA, RNA, protein structures; RNA synthesis
9/8-9/12	Chapter 13	RNA synthesis: transcription
9/15-9/19	Chapter 14	RNA splicing and editing
9/22-9/26	Chapter 15, 16	Protein synthesis: translation, genetic code
<b>9/29</b>	<b>Midterm 1. You must take each midterm in the lecture period in which you are registered.</b>	Exam includes through lecture on 9/24
10/1-10/3	Chapter 18, pp 707-708 Box 20-1,	Gene regulation in prokaryotes and eukaryotes
10/6-10/10	Chapters 19, 20	Gene regulation in eukaryotes Regulatory and non-coding RNAs
10/13	Online Blackboard notes	Applications of molecular biology to medicine
10/15 10/17	<b>Prof. Chiolo lectures</b> Chapter 8	Genome Organization: DNA sequence, Chromosome and Chromatin
10/20-10/24	Chapter 8, pp 185-188, pp 687-691	Chromatin modifications and chromatin inheritance; Chromatin mapping.
10/27	Chapter 9	DNA replication
<b>10/29</b>	<b>Midterm 2. You must take the midterm in the lecture period in which you are registered.</b>	Exam includes through lecture on 10/24
10/31	Chapter 9	Regulation of DNA replication
11/3-11/7	Chapter 10	Mutability and repair of DNA (Mismatch Repair, Damage reversal, BER, NER, TLS, DSB repair)
11/10-11/14	Chapter 11	Homologous recombination mechanisms
11/17-11/21	Chapter 11	Regulation of homologous recombination, meiotic recombination
11/24 11/26 11/28	Chapter 12 No lecture No lecture	Site-specific recombination
12/1-12/5	Chapter 12, pp 172-3, pp 706-711	Transposition and VDJ recombination. Genome editing.
<b>12/17</b>	<b>Final Exam: Wed, 12/17 8:00-10:00am (Both 11am and 12pm lectures together)</b>	<b>Rooms still to be determined</b>

**Statement on Academic Integrity:**

USC seeks to maintain an optimal learning environment. General principles of academic honesty include the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one's own academic work from misuse by others as well as to avoid using another's work as one's own. All students are expected to understand and abide by these principles. SCampus, the Student Guidebook, contains the Student Conduct Code in Section 11.00, while the recommended sanctions are located in Appendix A: <http://www.usc.edu/dept/publications/SCAMPUS/gov/>. Students will be referred to the Office of Student Judicial Affairs and Community Standards for further review, should there be any suspicion of academic dishonesty. The Review process can be found at: <http://www.usc.edu/student-affairs/SJACS/>.

**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. Tabancay as early in the semester as possible. DSP is open Monday-Friday, 8:30 to 5:00, (213) 740-0776.