BIOL 4160 MOLECULAR GENETICS, FALL 2019

Tu/Th 9:25 – 10:40 am, BIOS352

Department of Biological Sciences

College of Natural and Social Sciences

California State University, Los Angeles

# Instructor Information

Dr. Hyunsook Park

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**Office Hours**: M 11:00 -1:00 pm

# Course Description

Molecular genetics examines the structure and function of genes and genomes. Topics to be explored include the assembly and analysis of genomes, the regulation of gene expression, the DNA damage response, DNA repair, DNA replication and growth control.

**Prerequisites**: BIOL 3400 and CHEM 2200

# Course Objectives/Outcomes

Upon successful completion of this course, students will be able to:

1. Demonstrate the understanding of the methods used to study genomes including the concept of omics, molecular techniques, DNA sequencing, and genome functions.
2. Demonstrate the understanding of the anatomy of genomes.
3. Demonstrate the understanding of central dogma, chromatin structure, transcription, translation, genome replication and regulation.

# Required Course Materials

**Textbook** Brown, Terence A., Genomes, 4th Ed.

Use the emphasis placed on material in lecture as a guide for the text. Any additional materials will be announced in class and made available on Canvas.

# Course Policies

**Attendance:** Students are responsible for all material presented in class, including announcements about changes in course procedures. There will be several active learning activities during class without prior announcement and will be incorporated to class performance. There will be absolutely no make up for any missed class activities. A fair calculation for the time required for this class should take into account the need to spend at least 2 hours of independent study for each class hour. Exam content will draw heavily from lectures.

**No Make-up Examinations:** Missed events will be set as “0 points” unless satisfactorily justified with supporting documentation (e.g. doctor’s note). Students are responsible to obtain the missed information from their team mates and through self-study. There will be no make-up instruction.

**Reading Assignment/Self study:** The lecture topics, including chapter sections to read, are listed in the syllabus. It is highly recommended that you read the material before the lecture in order to have a complete understanding of the topics being presented. Lecture quizzes will be given via Canvas to assess your reading assignment and follow-up self-study. You will be given **two attempts** and higher score will be counted toward final grades. Your first attempt should be a pre-lecture self-assessment on the chapter reading, and the second attempt should be a post-lecture learning assessment. Make sure you read the book before you take your first attempt, and review the lecture material before your second attempt. **No make-up will be given for missed quizzes.**

**In Class Activity:** There will be Group discussion/problem solving activity without prior notice. Participation will be credited toward the final grade.

**Writing Assignment:** TBA

# Course Outline

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| --- | --- | --- | --- |
| Week | Lecture | In-class activity | Readings/Assignments |
| 1 | Introduction to the class  Chapter 1 Genomes, Transcriptomes, and Proteome | DNA basics | pp 3 – 23 |
| 2 | Chapter 2 Studying DNA (tools and techniques) | Basic principles of cloning | pp 27 – 50 |
| 3 | Chapter 5 Genome Annotation | Writing Assignment I | pp 119 – 131 |
| 4 | Chapter 6 Identifying Gene Function | CRISPR case study | pp 135 – 151 |
| 5 | Chapter 7 Eukaryotic Nuclear Genomes | DNA profiling practice | pp 155 – 177 |
| 6 | **EXAM 1 (Tuesday)**  Chapter 8 Genomes of Prokaryotes and Eukaryotic Organelles | Metagenomics case study | pp 181 – 197 |
| 7 | Chapter 9 Viral Genomes and Mobile Genetic Elements |  | pp 203 – 214 |
| 8 | Chapter 10 Accessing the Genome | Epigenetics case study | pp 219 – 234 |
| 9 | Chapter 11 The Role of DNA-Binding Proteins in Genome Expression |  | pp 241 – 253 |
| 10 | Chapter 12 Transcriptome | Writing Assignment II | pp257 - 287 |
| 11 | Chapter 13 Proteome  **EXAM 2 (Thursday)** | Proteome analysis | pp 293 – 323 |
| 12 | Chapter 14 Genome Expression in the Context of Cell and Organism |  | pp 329 – 352 |
| 13 | Chapter 15 Genome Replication |  | pp 357 – 383 |
| 14 | Chapter 16 Mutations and DNA repair |  | pp 389 – 406 |
| 15 | Thanksgiving Week: No Class |  |  |
| 16 | Final Review |  |  |
| Final Week | TBD | | |

# Assignments and Grading Policy

Assignment due dates will be notified on Canvas and will be announced in class. An overall assignment, tests, and participation grade will be given based on the completeness and care evident in your homework and your test grades. Periodic class activities will be given in class or on Canvas. For Canvas activities, email notice will be sent as soon as the activities are available. There will be no make up for missed quizzes. Take advantage of time, study partners, email, and office hours to study your notes, objectives, and practice problems, and to complete your assignments well. Late submission will be subjected to point deduction.

**Grading**

EXAM 1 15% (100 pts)

EXAM 2 15% (100 pts)

FINAL EXAM 30% (200 pts)

In Class Activity/writing assignment 15% (100pts)

Online Quiz 15% (100 pts)

Total points 100% (600 pts)

Grades in this course are not curved. Course grades will be assigned as follows.

## Grading Scale

Grades in this course are not curved. Course grades will be assigned as follows:

|  |  |  |  |
| --- | --- | --- | --- |
| A | 92-100% | C | 70% - 72% |
| A- | 88% - 91% | C- | 67% - 69% |
| B+ | 84-87 % | D+ | 63% - 66% |
| B | 80% - 83% | D | 60% - 62% |
| B- | 76% - 79% | D- | 59% - 55% |
| C+ | 72% - 75% | F | Below 54 |

Note: There will be absolutely no possibilities for making up quizzes or assignments or obtaining extra credit.

**Drop Policy:** The drop policy established by the university will be strictly followed. After the no record drop deadline,students may drop a course only for “serious and compelling reasons”. Failing a course is not an acceptable reason for withdrawal. Acceptable documentation is required verifying the reason for the withdrawal. See the Schedule of Classes (<http://www.calstatela.edu/registrar/university-scheduling-office>) for information.

**Incomplete Grade Policy:** Incomplete grades can only be assigned when the majority of the coursework has been completed (essentially all work except the final exam), and the student is passing the course (grade of C or better). The submission of an Incomplete Grade Form is required.

**Computer/Internet Requirements** Students are expected to participate actively in the course using CSULA learning management system, [**CANVAS**](https://canvas.calstatela.edu/)**.**You will need to have an up-to-date browser, operating system and some additional software on your computer to take this class. Check the [ITS helpdesk](http://www.calstatela.edu/its/helpdesk/studentresources) link for student resources. Some of the documents in this course will be available to you in PDF form. If you do not have Adobe Acrobat Reader software on your computer, you can download it by going to [Adobe.com](http://get.adobe.com/reader/). This class will be in CETL Tech classroom equipped with up-to-date workstation and projection systems for multiple electronic devices, including connectors to laptops, and other portable devices. Students are encouraged to bring laptops or personal electronic devices for class lecture and activities.

# Course Communication

**Office Hours** To ensure that you will be seen promptly during office hours, arrange an appointment with me by email in advance. Drop-ins are fine, but if I am already meeting with another student you may have to wait. If you put in the effort required, you should learn a lot from this course. If you are having trouble, or are not learning what you hoped to learn, talk to me. I benefit from your feedback.

**Interaction with Instructor** The Instructor will make every effort to communicate frequently with students through announcements and postings within the Canvas site. Post any questions or comments you have about the course content and/or requirements in the *Muddiest Point* forum. Peer response to those questions are highly recommended and counted toward class participation. Questions of a more personal nature can be sent to the Instructor via email.As a student, you should expect to receive feedbacks and responses to postings within 48 hours. The Instructor will post an announcement alerting the students if he or she will be unavailable for more than a day.

**Email** All emails pertaining to the course must come from your *CSULA email account*.E-mail correspondence with the professor must be professional. Now is the time to start practicing for the job market, graduate school applications, business correspondence, etc. When you send a sloppy, unpunctuated e-mail (e.g., from your iPhone), you are conveying a message of non-professionalism, laziness, and indifference; this will hurt you dearly in the professional world. Having the discipline to write professional correspondence will benefit you!

**Netiquette** When posting on the discussion boards and chat rooms it is important to understand how to interact with one another online, ***netiquette***. You can read more about the rules of netiquette at <http://www.albion.com/netiquette/index.html>

**Please refer to this syllabus for all course procedural questions**. This syllabus is subject to change. If a change is made, the professor will immediately notify the class and post a revised syllabus.

# Helpful Student Resources

**Technical Resources** Information on CSULA technical support resources for students: (<http://www.calstatela.edu/cetl/technical-support-resources>)

**Student Support Services** Information on CSULA student support resources for students: (<http://www.calstatela.edu/cetl/student-support-resources>)

**Academic Support Services** Information on CSULA academic support resources for students: (<http://www.calstatela.edu/cetl/academic-support-resources>)

**Canvas Mentor Site** Information for students on how to be a successful online student and how to use Canvas: ([http://www.calstatela.edu/Canvasmentor](http://www.calstatela.edu/moodlementor))

# Course & University Policies

**Student Handbook**

Information on student rights and responsibilities, academic honesty, standards of conduct, etc., can be found in Schedule of Classes for the current quarter (<http://www.calstatela.edu/classschedule/>) under Policies and Procedures.

**Dropping and Adding**

Students are responsible for understanding the policies and procedures about add/drops, academic renewal, etc. Students should be aware of the current deadlines and penalties for adding and dropping classes: <https://get.calstatela.edu/Registrar.htm>.

**Americans with Disabilities Act (ADA)**

Reasonable accommodation will be provided to any student who is registered with the Office of Students with Disabilities and requests needed accommodation. For more information visit the website at <http://web.calstatela.edu/univ/osd/atlc.php>.

**Academic Honesty/** **Plagiarism**

Students are expected to read and abide by the University's Academic Honesty Policy, which can be found at <http://www.calstatela.edu/academic/senate/handbook/ch5a.htm> as well as in the current Schedule of Classes. Students who violate this policy will be subject to disciplinary action, and may receive a failing grade in the course for a single violation. All cell phones and other electronic devices are to be turned off during the exams.

Many incidents of plagiarism result from students’ lack of understanding about what constitutes plagiarism. However, you are expected to familiarize yourself with Cal State L.A.’s policy on plagiarism. All work you submit must be your own scholarly and creative efforts. Cal State L.A. plagiarism as follows: “At Cal State L. A., plagiarism is defined as the act of using ideas, words, or work of another person or persons as if they were one’s own, without giving proper credit to the original sources.”