

California State University, Los Angeles  
Department of Biological Sciences  
SUMMER, 2018

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**Course title, number and units: Principles of Gene Manipulation, Biology 4170 (4)**

Instructor: Sunjay Jayachandran, PhD  
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Class Location: BIOS 334  
Time: TuTh 2:45PM-4:48PM  
Office hours: TTh 1:45-2:44

Description: Genetic engineering and its application in molecular biology and biotechnology.

Prerequisites: BIOL 340 or MICRO 340; BIOL 380 or CHEM 435 and their semester equivalents

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**Course Requirements:**

**Textbook:** There is no required textbook for this course. Instead, we will utilize primary or review articles from the contemporary scientific literature. Thoroughly reading these materials is essential for success in this course.

**Attendance:** Students are responsible for all material presented in class, including announcements about changes in course procedures. 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.

**Evaluation:**

**Tests:** There will be three exams. The exams will be objective and consist of multiple choice and essay questions. The final exam will be comprehensive. No make-up tests will be scheduled. With an excused (i.e. discussed in advance or doctor's note) absence for a test, the value of the final exam will be increased to compensate for the missed test. If evidence of emergency can be provided for a missed final, an Incomplete will be given.

**Grading:**

First Test	20%
Presentation	35%
In Class Activities/ Paper	25%
Final Exam (Online)	20%

Tentative Course grades will be assigned as follows:

A:	93% - 100%	C:	73% - 76%
A-:	90% - 92%	C-:	70% - 72%
B+:	87% - 89%	D+:	67% - 69%
B:	83% - 86%	D:	63% - 66%
B-:	80% - 82%	D-:	60% - 62%
C+:	77% - 79%	F:	below 60%

**Exams**

Exams will be multiple choice, short answer, essay. They will also draw from discussed papers, guest speaker and presentations. You may be asked to draw and label an answer. To earn a "C," you must know the facts. To earn an "A," you must be able to work with the facts.

**In Class Activities and Paper Discussions and Online Paper summary**

There will be several in class activities where students will work in groups of 4-5 and experimentally solve a particular gene based problem. Students will also work in groups to discuss various sections of assigned papers. This is a critical part of the grade.

I will also assign several papers involving gene manipulation and it will be your job to summarize these papers.

**Presentation (PowerPoint)**

Each group will present a 15 minute lecture on a list of topics that will be made available. An introduction, general methodology, results and discussion.

**Use of computers**

You will need email, the Internet, software such as Microsoft Word and PowerPoint, and access to a printer. On some days, you will be encouraged to bring a laptop to class to do bioinformatics exercises. To access campus computing facilities and the academic information network, you must have a myCSULA IDENTITY ACCOUNT. If you are a registered CSULA student, you should have already activated an account. If you are taking this class through Open University, you also need to activate a myCSULA IDENTITY ACCOUNT. You will be issued a CIN and PIN by the Extended Studies office after you pay to register for the class. You can then activate the account online by going to: <https://id.calstatela.edu> and clicking on the link 'I want to activate my student account' found in the 'Let's Get Started' box. For additional information and help regarding the University's Computing Resources and myCSULA IDENTITY please visit: <http://www.calstatela.edu/its>.

**Course Moodle Webpage** – <https://moodle.calstatela.edu/>. PowerPoint lecture **outlines** (these are NOT all you need to know for the course!), course syllabus, major grades, and announcements. Please check our Moodle course regularly for important information.

### **Course Policies**

- **Drop Policy**—The drop policy established by the university will be strictly followed. After the no record drop deadline (**Monday 06/09/2018**), 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 for information. **06/10/2018**: last day to add for Summer quarter. **06/10/2018**: Last day to withdraw for a grade of “W”.
- **Credit by Exam**—Credit by Exam is not offered for this course.
- **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.
- **ADA Compliance**: Reasonable accommodation will be provided to any student who is registered with the Office of Students with Disabilities and requests needed accommodation.
- **ACADEMIC HONESTY**: 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.**
- **Email - All emails pertaining to the course must come from your CSULA email account.** E-mail correspondence with the professor and lab instructors 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!
- **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.

### **General Advice**

- 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.

### **Course Goals**

- Define the natural biological elements that are able to manipulate genome structure and function.
- Become knowledgeable of the techniques which utilize these elements for the purpose of gene manipulation.
- Become proficient at utilizing select bioinformatics tools to assess genome structure and function, and to develop gene manipulation strategies.
- Connect gene manipulation strategies and applications to various modes of basic and applied research.
- Become acquainted with various career opportunities which utilize the concepts and applications with which this course interacts.

### **Course Schedule:**

<b>Day</b>	<b>Date</b>	<b>Lecture Topic</b>
T	29-May	Introduction to Gene Manipulation / Review of Molecular Biology
Th	31-May	Molecular Biology of Cloning I – Introduction & Basic Tools
T	05-Jun	Molecular Biology of Cloning II – Restriction Enzymes, PCR, Ligation, &

		More!
Th	07-Jun	Discussion of paper-Bacterial Genetics
T	12-Jun	Dr. Hanqing Li, Caltech
Th	14-Jun	Dr. Howard Xu, CSULA
T	19-Jun	RNA Interference/Parkin paper
Th	21-Jun	Dr. Erica Freeman, UCR
T	26-Jun	Inflammation Paper
Th	28-Jun	<b>Exam I</b>
T	03-Jul	Dr. Deisy Contreras, Cedar Sinai
Th	05-Jul	Dr. Ting-Fang He, City of Hope
T	10-Jul	Animal Models of Gene Manipulation /CRISPR
Th	12-Jul	CRISPR
T	17-Jul	Student Presentation
Th	19-Jul	Student Presentation
T	24-Jul	Dr. Cynthia Reyes, Salk Institute
Th	26-Jul	Student Presentation
T	31-Jul	Paper summary due online
Th	02-Aug	PACE Diagnostic Meeting
T	07-Aug	<b>FINAL EXAM : (Online)</b>

IMPORTANT ANNOUNCEMENT about Q2S conversion (Fall 2016):

CSULA is switching to the semester system beginning Fall 2016, and all students need to 1) plan ahead so they can graduate before the transition, or 2) create an individual advisement plan (IAP) if they will graduate after we transition to the semester system. If you will need to develop an IAP, when you log into your GET account, you will get a pop-up message informing you of this. For more information, please visit the website for the Office of Semester Conversion ( <http://web.calstatela.edu/academic/aa/semester/students/>). For help in

planning ahead to graduate before transition or in creating an IAP, please contact one of the offices below.

**For Q2S planning and advisement contact:**

UNDECLARED MAJORS

University Academic Advisement Center (UAAC)  
Library Palmer Wing (PW) Room 1040A  
(323) 343-3150  
<http://www.calstatela.edu/academicadvisementcenter>

Declared MAJORS:

Their College Advisement Center

e.g., Math majors should contact  
Natural and Social Sciences (NSS) Advisement Center  
King Hall (KH) D-1051  
(323) 343-5284  
<http://web.calstatela.edu/academic/nssd/AdvisementCenter/StudentServices.php>