

Life Sciences 187A: Principles and Practices of Genomic Research (4 credits)

Spring 2008 Syllabus

This course is designed for undergraduate students interested in research. This course has three hours of Lab meetings and lecture per week and a six hours of laboratory research each week.

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LECTURE & LAB MEETINGS:

M	3:00 pm – 4:00 pm (Lecture)	La Kretz 100
W	3:00 pm – 4:00 pm (Presentation)	La Kretz 100
F	3:00 pm – 4:00 pm (Lecture)	La Kretz 100

LABORATORY RESEARCH: TR or WF 8:00am – 12:00pm (6 hours max)
3336 Young Hall South

URI website: www.lsic.ucla.edu/ugri/
Course website: www.lsic.ucla.edu/classes/winter2008/
Lab website: <http://lslab.lscore.ucla.edu/>

RESEARCH PROJECT.

Life Sciences 187 offers you the opportunity to participate in research in microbial and mouse genomics by a.) sequencing the genome of *Ammonifex degensii*, a thermophilic bacterium and b) by genotyping genotypic variations of six homozygous mouse strains by using microsatellite.. As student researchers, you will be members of the UCLA Undergraduate Genomics Research Initiative (UGRI), a precedent-setting undergraduate education in which students conduct cutting-edge research in genomic biology and biotechnology. UGRI is a collaborative, cross-disciplinary effort among undergraduates in lower and upper division life science courses. The UGRI intends to be the first group of undergraduates to produce an annotated microbial genome. For regular updates of our activities, link to www.lsic.ucla.edu/ugri/

RESEARCH REQUIREMENTS.

LS187A students must conduct six hours of laboratory research per week. In addition, students are required to attend weekly lectures on Mondays from 3-4PM in La Kretz 100 and group meetings on principles and techniques held at 3-4 PM on Wednesdays and Fridays in La Kretz 100. Teamwork is essential for a successful genotyping project. Accordingly you are expected to be professional, punctual, observant and alert to the day's activities, and willing to collaborate with your fellow researchers.

RESEARCH MATERIALS

- White lab coat worn at all times in lab
- Lab notebook (any 8 × 11 bound type, college ruled) – you do NOT need the carbon paper type
- Download assigned readings and protocols from course website

IMPORTANT LAB RULES:

- Lab computers and printers may not be used for personal purposes
- No open toed shoes (i.e., no flip-flops, sandals, or bare feet)
- Punctuality is essential

IMPORTANT DUE DATES:

Deadline is 12:00 noon at the date specified delivered to 3336 YHS unless otherwise noted:

Quiz Preparation	Monday prior to quiz date
Presentation of Assigned Paper	2-2:25 PM on Journal Club meetings (Mondays)
Abstract for Science Day Poster	April 26, 2007
Seminar Report	May 16, 2007
Science Poster Day	May 21, 2007 (1–4 PM on Monday, Ackerman Grand Ballroom)
Summary of Science Day posters	May 30, 2007

LECTURES, LAB MEETINGS and LABORATORY RESEARCH

Lectures (M/F 3-4 PM, La Kretz 100). We discuss sequencing theory and practice. Please complete assigned readings prior to lecture. PowerPoint slides can be downloaded from the course website.

Lab Meetings (WF 3-4, La Kretz 100). These are an important part of research: it's an opportunity to discuss findings and troubleshoot problems. As a group we also discuss theory, practice and our results. Please note that there will be five *unannounced* quizzes given at the beginning of the Wednesday lab meetings.

Laboratory Research (TR or WF, 8AM – 12PM, 3336 YHS). This is when your research will be conducted, which primarily consists of sequencing and preliminary annotation of *A. degensii*'s genome.

GRADING

	<u>Pts</u>	<u>%</u>
Conduct and Initiative (50 pts each)	100	20%
Quizzes (5 at 20 pts each)	100	20%
Midterm	100	20%
Final Exam	100	20%
Open Seminar Report	50	10%
Lab Notebook	50	10%
Total Points	500	100%

Attendance at Monday and Wednesday lab meetings (2 hrs/wk) and fulfillment of the required weekly research hours (6 hrs/wk) are both **MANDATORY** – unexcused absences from any of the foregoing shall result in a **demerit**. (Excused absences will be given for extenuating circumstances such medical reasons, bereavement, MCAT testing, med school interviews, etc.) Demerits will result from behavior such as (without limitation): carelessly breaking equipment; repeated incorrect analyses of data despite instruction

and/or mentoring; uncooperativeness; excessive tardiness; and/or unexcused absences. You will be notified if you incur a demerit.

Grades will be assigned by point totals: A, > 90%; B, >80% etc., and determined by the Instructor. Any You will be notified of any demerits you incur. Demerits will lower your grade.

Students are expected to be aware of the University of California policy on academic integrity pursuant to the UCLA Student Conduct Code (www.deanofstudents.ucla.edu). Please review sections on (1) plagiarism, (2) cheating and (3) use of unauthorized study aids. Violations are promptly referred to the Dean of Students. Penalties for violation are quite severe, will become a permanent part of your academic record, and will likely preclude entry to any graduate or professional school worth attending.

INITIATIVE

By enrolling in the course you have taken the initiative through research in a relatively unstructured setting. As for any research scientist, this opportunity is what you make of it. Thus you begin the quarter with 50 points for initiative. If the teaching team observes that you make poor use of your laboratory time or computer laboratory time, your 50 initiative points will be docked incrementally. Our progress depends on the quality and quantity of everyone's contribution.

LAB NOTEBOOK

You will log your observations, findings, results of experiments, changes to protocol, formulas, and unusual and pertinent findings or observations in your lab notebook. You do not need to restate the protocol. Your lab notebooks will be checked periodically during the quarter. Your lab notebook may not leave the laboratory and thus must be updated in lab.

SEMINAR REPORT

An important aspect of scientific research is your ability to effectively communicate your results. You are expected to write a one page summary of a seminar you attend at UCLA (see "Events in Molecular Biology" link at course website). This is due no later than 12:00 noon on **May 16, 2008**.

QUIZZES AND EXAMS

Quizzes will relate to the preceding Friday lecture and any assigned reading, including articles. Quizzes are approximately 20 minutes long and are taken by all students at the beginning of Wednesday meetings. No extra time given for tardiness. Each quiz is worth 20 points, and is UNANNOUNCED. The midterm is scheduled for **Friday May 2, 2008** and the comprehensive final exam is on **Wednesday June 11, 2008**.

PRESENTATIONS DURING LAB MEETINGS

Presentations are an integral part of the research learning experience. Each research group will be required to give a presentation during the quarter (see schedule and your group assignment). PowerPoint presentations are to be 25 minutes in length (inclusive of Q & A). Your presentation must be reviewed by the Instructional Team PRIOR to presentation, so please make advance arrangement.

		LS187A Spring 2008 Dr. Pfluegl							
		Lecture M/F 3 - 4 pm LaKretz 100							
		Lab Presentations W 3 - 4 pm LaKretz 100							
		Lab Meeting W 3 - 4 pm LaKretz 100							
Week	Lab Topic	Lecture Topic	Mo	Tu	We	Th	Fr	Presentation Topic	
1	Train		31-Mar	1-Apr Train	2-Apr Train	3-Apr Train	4-Apr Train		
		Intro	Lec 1		Lec 2			Ammonifex	
2	Miniprep		7-Apr	8-Apr AB1	9-Apr FG1	10-Apr CD1	11-Apr HI1		
		Sequencing	Lec 3		LabMeet		Lec 4	Technology	
3	PCR		14-Apr	15-Apr E1	16-Apr J1	17-Apr ABLicor	18-Apr FGLicor		
		Blast	Lec 5		Lec 6		LabMeet	Annotation	
4	GEL		21-Apr	22-Apr CDLicor	23-Apr HILicor	24-Apr AB6	25-Apr FG6		
		Genetics	Lec 7		LabMeet		Lec 8	Mouse genetics	
5	Blast SNPs		28-Apr	29-Apr AB1 CD6	30-Apr FG1 HI6	1-May CD1 E6	2-May HI1 J6		
			LabMeet		Midterm		Lec 9	Mouse genetics	
6	MS		5-May	6-May E1	7-May J1	8-May AB4	9-May FG4		
		Restriction digest	LabMeet		Present A		Present F	Miniprep	
7	MS		12-May	13-May CD4	14-May HI4	15-May AB6	16-May FG6		
		Agarose	Present B		Present G		Present C	Li-cor gel	
8	SNPs		19-May	20-May AB1 CD6	21-May FG1 HI6	22-May CD1 E6	23-May HI1 J6		
		Mouse Genomics	Present H		Present D			Mouse Genomics	
9	SNPs		26-May Holiday	27-May E1	28-May J1	29-May AB4	30-May FG4		
		Mouse Genomics			Present I		Present E	Mouse Genomics	
10	SNPs		2-Jun	3-Jun CD4	4-Jun HI4	5-Jun AB6	6-Jun FG6		
		Summary	Lec 10		Present J		Final	Mouse Genomics	
Finals			9-Jun	10-Jun	11-Jun	12-Jun	13-Jun		