

Life Sciences 187B/C: Principles and Practices of Genomic Research (4 credits)

Spring 2008 Syllabus

This course is designed for undergraduate students interested research. This course has three hours of Lab/Journal Club meetings and six hours of laboratory research each week (for a total of 9 hrs/wk).

INSTRUCTOR:	Gaston M.U. Pfluegl 2875 Slichter Hall (310) 794-4113	(drpfluegl@gmail.com)
TEACHING TEAM:	Karen Flummerfelt	(karenf@microbio.ucla.edu)
COURSE ADMINISTRATOR:	Lily Yanez Mark Katayama 2305 Life Sciences	(lyanez@lifesci.ucla.edu) (Katayama@lifesci.ucla.edu) (310) 825-6614
LECTURE & LAB MEETINGS:	R 2:00 pm – 3:00 pm (Journal Club) R 3:00 pm – 5:00 pm (Annotation)	YHS4340 YHS4336
LABORATORY RESEARCH:	TR or WF 8:00am – 12:00pm 3336 Young Hall South (310) 825-0171	
UGRI website:	http://www.lsic.ucla.edu/ugri/	
Course website:	http://www.lsic.ucla.edu/classes/spring07/	
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.) annotating the genome of *Ammonifex degensii*, a thermophilic bacterium and b) by genotyping genotypic variations of six homozygous mouse strains by using SNPs and microsatellites. 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.

LS187B students are required to (i) conduct six hours of laboratory research per week (TR or WF as selected by the student), (ii) attend weekly Journal Club meetings on Mondays (2-3 PM) and (iii) laboratory meetings with LS187A students on Wednesdays (3-4 PM). Selected Friday meetings for poster preparation also need to be attended. Teamwork is essential for a successful DNA sequencing 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
- Use same lab notebook from prior quarter
- Download assigned readings from UCLA library
- Download 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
- Mentoring of LS187A students by LS187B students

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 15, 2008
Seminar Report	May 16, 2008
Science Poster Day	May 19, 2007 (1–4 PM on Monday, Ackerman Grand Ballroom)
Summary of Science Day posters	May 30, 2007

TIME COMMITMENT:

LS187B requires a considerable time commitment. You will be spending a lot of time outside of class on important research related projects for this course. Because of this, **there is NO midterm or final exam** for this class. However – and we cannot stress this enough - we strongly recommend that you mark your calendars and take advantage of any down-time in your work and class schedules to get a head start on:

- Preparing your 25-minute PowerPoint presentation of your assigned Journal Club reading. This work also involves: (1) conducting as-needed, self-directed research to augment your understanding of the material; and (2) sourcing visuals and other materials to enhance your PowerPoint presentation
- Preparing your single 20 point quiz that the Instructional Team will give to your colleagues.
- Preparing with your fellow LS187B researchers an abstract and poster for Science Poster Day.

You must attend the Science Poster Day on Monday, **May 19, 2007** from 2-4 PM. Someone from the group needs to setup the poster (before 1:00 PM) and take down the poster (after 4:00 PM).

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.

MONDAY, WEDNESDAY MEETINGS and LAB RESEARCH

Journal Club (R 2-3PM see schedule below). Functioning as a research group, we will meet during this period to discuss the assigned reading for the week (a paper that relates to the field of microbial genomics). This will be a seminar style discussion moderated by member(s) of the instructional team. It will be, therefore, a student led discussion therefore it is critical that you read the papers ahead of time.

Annotation Meetings (R 3-5 PM). Lab meetings 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. LS187B students are serving as mentors for the LS187A students, and therefore you are an important resource and contributor to these meetings.

Laboratory Research (TR or WF, 8AM – 12PM, 3336 YHS). This is when your research will be conducted, which primarily the sequencing and preliminary annotation of *A. degensii's* genome. LS187B student researchers will be evaluated on their abilities to **mentor** other students. You must be reliable, responsible, and a source of correct and helpful information. You are expected to set a good example both in the lab and in lab meetings.

Grading for 187B

Points

Lab Meetings and Journal Club (3 hours/week):	0 (mandatory)
Fulfillment of Required Research Hours (6 hours/week):	0 (mandatory)
Presentation of Assigned Paper	150
Quizzes	100
Participation	100
Seminar Report	50
TOTAL	400

Grades will be assigned by point totals: A, > 90%; B, >80% etc., and determined by the Instructor. Any behavior such as (without limitation), breaking equipment, repeated incorrect analyses of data, failure to cooperate, excessive tardiness, or absences will result in demerits that will lower your grade. If you incur a demerit, you will be notified.

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 violations 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.

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

Quizzes will relate to each assigned reading. Quizzes are approximately 10 minutes long and taken by all students (except the presenter) during the last 10 minutes of the Journal Club (M 2-3 PM). Quizzes will relate to the paper to be presented that day. Each presenter will prepare a 20 point quiz consisting of multiple choice, true/false, and/or short answer questions based on the paper they are assigned to present. A blank master copy of this quiz, along with completed answer key, will need to be submitted to the Instructional Team on the Monday prior to the quiz date for feedback.

PRESENTATION OF ASSIGNED PAPER (Journal Club)

In the journal club, we will discuss articles from literature focusing on the broader aspects of genomic biology. Each student will present two papers. Students should be prepared for a question and answer session and a critique of the presentation. All students will be graded for participation.

Research paper presentations (Journal Club) will be graded based on the following 150 point breakdown. Each member of the Instructional Team will give you a 30 point assessment, for a maximum total of 120 points. Your peers will also evaluate you on a 6 point scale, for a maximum total of 30 points.

*Guidelines for your seminar presentation are available on the course website
We are happy to go through your slides with you, prior to your presentation.*

Important: Presentations should be 25 minutes long, expect a five minute question and answer period following. The speaker will arrive early, with Flashstick/laptop to set up for the presentation so that we can start promptly on the hour. Presentations should include Supporting Online Material when relevant. The remaining 20 minutes of class will be devoted to the quiz.

SCIENCE POSTER DAY

For the past three years, LS187 has proudly participates in UCLA's Science Poster Day. As LS187B students, it is your responsibility to uphold this fine tradition. Working as a team, you will prepare and submit an abstract, create visual aids, and present a poster at this campus-wide event. An abstract (225 words maximum) is due **April 14, 2008** and must be submitted to the instruction team prior to submission. The UCLA Science Poster Day is held **May 19, 2008** from 1-4pm in Ackerman Grand Ballroom. For more information, visit <http://www.college.ucla.edu/urc-care/confspd.htm>

Participation in Science Poster Day is worth a total of 100 points:

16-point peer evaluation of your total participation (5 evaluations total)	80 points
Attendance at Poster Day	10 points
Written summary of 3 additional posters at event	10 points

The written summary of three posters is 1.5 pages (half a page for each poster, 12 pt. font, single spaced, on 8 x 11 paper). This will be due **May 30, 2008**.

Important: Team participation in Science Poster Day is critical. If the team fails to submit the abstract in a timely fashion, or the poster is not ready the day of the presentation, then points allocated to this portion of your grade (and the rest of the team) will be forfeited.

JOURNAL CLUB Schedule LS187B/C

R Mar	3 (2-3 PM)	Organizational meeting. Tutorial on using PubMed and UCLA web library.
R Apr	10 (2-3 PM)	Group summary of Paper 1
R Apr	17 (2-3 PM)	Presentation of Paper 1 / Quiz on Paper 1/Summary Paper 2
R Apr	24 (2-3 PM)	Presentation of Paper 2 / Quiz on Paper 2/Summary Paper 3
R Apr	1 (2-3 PM)	Presentation of Paper 3 / Quiz on Paper 3/Summary Paper 4
R May	8 (2-3 PM)	Presentation of Paper 4 / Quiz on Paper 4/Summary Paper 5
R May	15 (2-3 PM)	Presentation of Paper 5 / Quiz on Paper 5/Summary Paper 6
R May	22 (2-3 PM)	Presentation of Paper 6 / Quiz on Paper 6/Summary Paper 7
R May	29 (2-3 PM)	Presentation of Paper 7 / Quiz on Paper 7/Summary Paper 8
R June	5 (2-3 PM)	Presentation of Paper 8 / Quiz on Paper 8

LS187B/MIMG197 Annotation Project Preliminary Schedule

Tentative Annotation Agenda Thursday April 10th 2008 Second Week.

Prerequisite: Read Ammonifex *degensii* paper prior to Thursday meeting

First Lab Meeting in YHS4340 We 2-3pm.

- Pick Partner
 - Pick Timeslots (4h/week computer lab)
 - Coordinate with Partner
- In lab assignment (1.st Week Th/Fr)
 - Assessment
 - Create Account (group 'UCLA')
 - Familiarize with CGAT <http://cgat.mcs.anl.gov/FIG/seedviewer.cgi>
 - Student ID: 'test' Password: '1234'
 - Link: 'Private: Ammonifex degensii KC4'
 - Blast/CGAT exercise
 - Blast dnaA/ftsZ against Ammonifex sequence in CGAT, both nucleotide and amino acid search
- Homework Reading Assignment:
 - "predicting protein function from sequence and structure".
David Lee, Oliver Redfern and Christine Orengo.
Nature Reviews, Molecular Cell Biology, Vol. 8, December 2007 995-1005.

LS187BC Spring 2008							
Dr. Pfluegl							
Journal Club		B/C	R	2 - 3 pm YHS 4340		Due Dates	
AnnotationTeam Meeting		R	3 - 5 pm YHS 4336				
Week	Journal Club	Mo	Tu	We	Th	Fr	Team meeting Topic
1	Assign Papers	31-Mar	1-Apr	2-Apr	3-Apr JC	4-Apr	
2	A Summary	7-Apr	8-Apr	9-Apr	10-Apr JC Annotat	11-Apr	Project AB Topics Ammonifex lecture
3	B Summary A Present	14-Apr Licor Poster	15-Apr Poster Abstract	16-Apr	17-Apr JC Annotat	18-Apr	Project CD Topics
4	C Summary B Present	21-Apr	22-Apr	23-Apr	24-Apr JC Annotat	25-Apr	Project EF Topics
5	D Summary C Present	28-Apr	29-Apr	30-Apr	1-May JC Annotat	2-May	Computerlab Annotation Lecture
6	E Summary D Present	5-May	6-May	7-May	8-May JC Annotat	9-May Poster	Computerlab JGI Tools
7	F Summary E Present	12-May	13-May	14-May	15-May JC Annotat	16-May Seminar Report	Lecture/Lab Meeting
8	B Summary A Present	19-May Poster Day	20-May	21-May	22-May JC Annotat	23-May	Project AB Results
9		26-May Holiday	27-May	28-May	29-May JC Annotat	30-May Poster Summary	Project CD Results
10	F Present	2-Jun	3-Jun	4-Jun	5-Jun JC Annotat	6-Jun	Project EF Results
Finals		9-Jun	10-Jun	11-Jun	12-Jun	13-Jun	