

BIO 345 – Advanced Recombinant Techniques

Fall, 2009 Syllabus

- Instructor:** Dr. André P. Walther
Miller Building 25, x3513
awalther@cedarcrest.edu
- Office hours:** Wed and Fri 10 AM - 11 AM, Tue 11 AM –noon,
or by appointment
- Class time & place:** Monday, Wednesday, Friday 11:00 - 11:50 am (3 credits),
SCI138
- Required Text:** The Course will be based on primary literature and review articles
that will be supplied by Dr. Walther via eCollege.
- Prerequisites:** BIO335/BIO336

Course Description:

This course will cover advanced techniques in molecular biology with a special focus on molecular genetic and recombinant techniques. We will discuss the mechanisms of manipulating the genomes of scientifically important model organisms. We will also cover the multiple “omics” including genomics and proteomics.

Objectives

The objectives for students in this course are to:

- Achieve a detailed understanding of advanced molecular biology techniques.
- Understand how genomes can be genetically modified.
- Gain experience in reading primary scientific literature.
- Develop expertise in logical problem solving.

Course Outcomes

Upon successful completion of the course, students will:

- Demonstrate the ability to engage in scientific reasoning by interpreting and discussing primary scientific literature.
- Demonstrate the ability to communicate these concepts orally and in writing.

Assessment

The outcomes described above will be assessed through:

- Written exams: scientific / quantitative reasoning, written communication ability
- Oral presentations: scientific reasoning, oral communication ability
- Class participation: oral communication ability

Student Responsibilities

Readings:

The reading materials are integral to this course. Readings must be completed prior to class in order to facilitate student discussion. Failure to come prepared to class will impact participation grades. You are responsible for all material in the assigned reading, whether or not it is discussed in lecture. Anything in the assigned reading or lecture notes is fair game for exams.

Attendance:

It is strongly recommended that you attend class. A significant portion of your grade involves your class participation. Repeated absences will negatively affect your participation grade.

Scholarship and Integrity:

I fully support the Cedar Crest College Honor Code and the Classroom Protocol code as stated in the Customs Book. You are required to abide by the Honor Code and by accepted practices of scholarship and integrity. All writing and other material that you submit must be your own, original work, unless otherwise acknowledged. Material that is quoted from another source must be clearly indicated as a quotation and must be followed immediately by a citation to the original source. Paraphrasing is not acceptable as original work; editing someone else's writing does not make it your own work. Cheating or plagiarism will result in a grade of F for the assignment or the entire course, at the instructor's discretion. If you have any questions about these issues, please discuss them with an instructor.

Classroom protocol:

The Honor Code states, "Appropriate classroom behavior is implicit in the Cedar Crest Honor Code. Such behavior is defined and guided by complete protection for the rights of all students and faculty to a courteous, respectful classroom environment. That environment is free from distractions such as late arrivals, early departures, inappropriate conversations and any other behaviors that might disrupt instruction and/or compromise students' access to their Cedar Crest College education."

Students with Disabilities:

Students with documented disabilities who may need academic accommodations should discuss these needs with their professors during the first two weeks of class. Students with disabilities who wish to request accommodations should contact the Advising Center.

Assignments and Evaluation

Exams (400 pts)

Each of the two 200 pt, in-class exams during the semester will cover reading and lecture material since the previous exam.

Exam #1: Wednesday, October 5

Exam #2: Monday, November 23

Comprehensive Final Exam (200 pts)

The comprehensive final exam will include course material from throughout the semester and final presentations.

Date: TBA

Informal Paper Discussion Leader (100 pts)

Students will choose a paper from a list provided by Dr. Walther. They will be responsible for a brief informal description of the main technique and topics described in the paper. Choice of paper and Dates of presentations TBA.

Informal Paper Question Submission (50 pts)

Students will be responsible for submitting TWO questions about discussed research papers to the assigned presenter and the instructor by 11PM the evening prior the paper discussion. This will be done for all papers and by all students in the course.

Final Presentation (200 pts)

Students will choose a topic of interest and give a formal 20 min PowerPoint presentation on the topic. Late delivery of assignments will result in a loss of points.

- Topic due (topic can not be changed later): Friday, Sept. 11
- Hard copies of 3 primary research articles and 2 review articles due: Friday, Oct. 16
- Draft of PowerPoint (electronic copy): Friday, Nov. 20 (11:59 PM)
- 20-minute MS PowerPoint presentation: Monday, Nov 30 - Friday, Dec. 8

Class Participation (50 pts)

Class participation and adherence to the classroom protocol may affect your participation grade. The participation grade will be determined solely at the discretion of the instructor.

There will be NO extra credit assignments, so make your points count.

Make-up policy for exams:

If you miss an exam due to illness or emergency that has been documented through the Dean of Student Affairs' office, you must contact the

instructor as soon as possible to arrange a make-up exam. Make-up exams will not be given for any other reason. Please note that make-up exams may be of a different format than the main exam given in class.

Your obligations for this course include attendance at the final exam, on the day and time scheduled by the Registrar's Office. You should not make travel arrangements until the final exam schedule is published; if you must make plans early, you should schedule your travel after the last final exam day.

Course Grading:

The course grade will be calculated to the nearest 0.1%, and the letter grade determined by the table below. Late assignments will be deducted 10% per calendar day, including weekend days.

Grading Scale:

A	93.0 - 100%	C	73.0 - 76.9%
A-	90.0 - 92.9%	C-	70.0 - 72.9%
B+	87.0 - 89.9%	D+	67.0 - 69.9%
B	83.0 - 86.9%	D	60.0 - 66.9%
B-	80.0 - 82.9%	F	< 60.0%
C+	77.0 - 79.9%		

Grading Disputes:

If a student has an issue about the grading of specific questions, I will be more than willing to hear them out, however this should be done in writing and should include specific evidence supporting the awarding additional points.

Your Keys to Success:

There is a large body of material to learn in this course. To learn successfully, you will need to attend the lectures, read the text and other assigned readings, and study effectively. You need to put in the effort, but help is available. Always feel free to ask questions!

Class Period	Date	Topic Schedule: <i>Subject to change</i>
1	Mon 8-24	Syllabus/DNA structure NO CLASS
2	Wed 8-26	How to Read a Paper/Lead a Paper Discussion
3	Fri 8-28	DNA/RNA Isolation
4	Mon 8-31	DNA recombination <i>in vivo/in vitro</i>
5	Wed 9-2	RE/Polymerases/Ligases
6	Fri 9-4	PCR/ /RT-PCR/cDNA libraries Choose Papers
NO CLASS	Mon 9-7	NO WORK ALLOWED
7	Wed 9-9	Zn Finger paper
8	Fri 9-11	Hybridization/Northern/Southern
9	Mon 9-14	qPCR/ qRT-PCR
10	Wed 9-16	Recombinant Protein Expression
11	Fri 9-18	Recombinant Protein Expression
12	Mon 9-21	Bacteria/Yeast
13	Wed 9-23	Yeast/ <i>C. elegans</i>
14	Fri 9-25	DM Memory paper/ D.melanogaster
15	Mon 9-28	D.melanogaster/Mouse
16	Wed 9-30	Mouse Parkinsons Model Paper/ Mouse
17	Fri 10-2	Human
18	Wed 10-1	Left overs
19	Mon 10-5	EXAM I
20	Wed 10-7	DNA Sequencing/Genomics
21	Fri 10-9	Genome paper/Genomics
NO CLASS	Mon 10-13	LAND HO IN 1492
22	Wed 10-14	CE RNAi paper/miRNA/RNAi
23	Fri 10-16	miRNA/RNAi/siRNA paper
24	Mon 10-19	GFP/Protein Localization/ Protein Localization Paper
25	Wed 10-21	Microarrays/SNP arrays
NO CLASS	Fri 10-23	POMP AND CIRCUMSTANCE
26	Mon 10-26	Transposable elements
27	Wed 10-28	Mouse deletion paper
28	Fri 10-30	Epistasis and such
29	Mon 11-2	SGA paper/Epistasis and such
30	Wed 11-4	Stem Cells
31	Fri 11-6	iPS paper/Stem Cell techniques
32	Mon 11-9	Gene therapy
33	Wed 11-11	Gene therapy/ Gene therapy paper
34	Fri 11-13	Ethics of GE
35	Mon 11-16	Human interactome paper/ Proteomics
36	Wed 11-18	ChIP paper/ ChIP
37	Fri 11-20	Left Overs/ Draft of Final Presentation due
38	Mon 11-23	EXAM II
NO CLASS	Wed/Fri 11-25/27	GOBBLE GOBBLE
	Mon 11-30 to 12-8	Final Presentations
	TBA	Comprehensive Final Exam

