

**Division of Biological Sciences**  
**BIMM101 Recombinant DNA (Sections F01 847513 and F02 847514)**  
**Course Information for Fall 2015**

<b><u>Instructor:</u></b> Dr. Jenny Herndon	<b><u>Phone:</u></b> (858) 246-0752	<b><u>Email:</u></b> jherndon@ucsd.edu
<b><u>Lectures:</u></b> MWF: 1:00 PM – 1:50 PM in SEQUO 148		
<b><u>Laboratory:</u></b> WF: 2:00 PM – 6:00 PM fourth floor York Hall Section F01: Room 4318 Section F02: Room 4332		
<b><u>Office Hours:</u></b> W: 11:00 AM–11:50 AM	<b><u>Office Location:</u></b> H&SS 1145C	

**REQUIRED TEXTS:**

- 1) BIMM 101 Lab Manual from Soft Reserves (available from the Bookstore)

**REQUIRED MATERIALS needed by the second day of class:**

- 1) UV blocking safety glasses (available at bookstore)
- 2) Lab coat (must be to the knees)
- 3) Lab notebook, preferably with carbon copies (bookstore or Grove general store)
- 4) Fine point Sharpie for labeling – get a dark color
- 5) Scientific calculator – graphing calculators and cell phones can not be used during quizzes
- 6) Long pants and closed toed shoes are required in lab at all times – no skin on feet or legs should be showing

**COURSE OBJECTIVES:**

BIMM 101 will introduce several key methods that are used in a typical molecular biology laboratory, focusing on the techniques and concepts that involve cloning DNA plasmid constructs and the analysis of DNA/RNA samples. The laboratory work will consist of five multi-day projects. We will begin by cloning and expressing a bacterial enzyme that exhibits luminescence, and then explore the efficiency of different promotor sequences in a synthetic biology project. Next, we will sequence a cytochrome oxidase (CO1) gene in different insect species in our biodiversity project, and then use an RNA interference (RNAi) technique in *C. Elegans*. Finally, we will analyze a sample of our own DNA to determine our PTC phenotype.

Since this is an introductory lab course, all lab work will emphasize the learning of basic lab skills and good lab technique. By performing these experiments, you will have the opportunity to practice the basic principles of quality scientific methodology. These include using proper controls in designing experiments/interpreting results, keeping an accurate and complete record of all experiments in a lab notebook, and the ability to troubleshoot a procedure when the expected results are not forthcoming.

**GRADE ASSIGNMENTS:**

Your grade will be determined from the following :

7 Quizzes (70pts each)	350
10 Pre-lab Quizzes (6pts each)	60
4 Written Assignments (70pts each)	280
Worksheets	30
Exam	280
<b>Class Point Total</b>	<b>1000</b>

**GRADE CUTOFFS:** (may be lowered at the instructor's discretion)

990-1000	A+	790-799	C+
910-989	A	710-789	C
900-909	A-	700-709	C-
890-899	B+	600-699	D
810-889	B	0-599	F
800-809	B-		

**LAB NOTEBOOKS:**

You will need to keep a formal lab notebook in which you collect your data from the laboratory experiments. You are strongly encouraged to update your notebook following each lab session. The notebook should be bound (spiral bound or composition book style are both okay), and should have numbered pages with a table of contents (it is okay to write these in). **You will need to hand in either photocopies or carbon copies of your notebook pages for the experiments that are written up as lab reports.** Your lab notebook for this course should contain the following:

- 1) Any numerical data you collect (such as spectrophotometer readings) neatly written in well-labeled spaces (Data tables can be written into the notebook before lab)
- 2) Printouts of any gel or film images taped into the notebook with all lanes labeled
- 3) Notes on any changes to the procedure for that experiment or other deviations from the lab manual
- 4) Notes on any mistakes, problems, or ways to improve the experiment—what would you do differently?

Your notebook should also include any calculations and analysis that is specifically called for in the lab manual. Be sure that each page has the experiment date and a title. A well-kept lab notebook serves as a portfolio of your work in the class that can be useful when interviewing for research internships and laboratory jobs. You will periodically need to turn in copies of your lab notebook for review.

### **TED (TritonLink Education):**

Many of the course materials are available only through the course website on TritonLink Education, or Ted (<https://ted.ucsd.edu>). All students will need to be able to access this site. Once you are enrolled in the class, you will have access to the site using your ACS username and password. Be sure to check the course website frequently for announcements and updates on assignments.

### **WRITTEN ASSIGNMENTS:**

There will be a total of four written assignments required during the quarter. The guidelines for each will be slightly different and can be found on the TED website. These assignments are due **at the beginning of lab** on the due date listed in the lab schedule. Please have them stapled or in a report binder prior to the start of class. For every day the assignment is late, 10% will be deducted for up to five days. After five days, the assignment will not be graded.

### **LAB QUIZZES AND EXAM:**

The purpose of the lab quizzes is to address the following: Are you keeping up with the material? Are you prepared for that day's lab? Have you been attending lecture? The quiz dates are given in the lab schedule. They will begin precisely at the scheduled lab start time (so be ready to go when you come in) and will take 20 minutes. They can contain any class material that was covered in lecture but will usually focus on material that was covered in lecture the prior week. Be sure to focus on understanding the purpose of the current lab project and how each experiment fits into this, the basic concepts underlying the procedures, and simple mathematical and analytical skills based on what you have actually done in lab. The quiz may also contain questions that pertain to the experiment that is scheduled for that day. The last exam is cumulative and will be held on the last lab meeting of the last week.

### **PRE-LAB QUIZZES**

These will be short, six question quizzes that are provided on the TED website. Generally these quizzes will be posted every week on **Tuesday at 2pm**, and will remain open for 24 hours. They are designed to assess your understanding of the procedures for the week and the underlying concepts of the experiment.

### **LAB ATTENDANCE POLICIES:**

Attendance at each lab session is **mandatory**. If you miss two labs, **you will be asked to drop the course**. If you are ill, you must send an email to the instructor as soon as possible and cc your IA. We will have you make-up the lab in a way that we will determine, usually by attending another section. **Only the instructor can excuse an absence.**

### **MAKING UP QUIZZES AND EXAMS:**

Please note that it is extremely burdensome for the instructor and IAs to have to prepare and proctor make-up exams. Missing a scheduled quiz or exam will only be excused for medical reasons where documentation can be provided. **If you are late the day of a scheduled quiz and miss the quiz, you will receive a zero for the grade.** At the instructor's discretion, a missed exam or quiz that is excused will either be dropped from the student's point total for the class, or made up by an oral exam scheduled within one week of the original exam or quiz.

### **STUDENTS WITH DISABILITIES:**

Students requesting accommodations for this course due to a disability must provide a current Authorization for Accommodation (AFA) letter issued by the Office for Students with Disabilities (OSD) which is located in University Center 202 behind Center Hall. Students are required to present their AFA letters to Faculty (please make arrangements to contact me privately) and to the OSD Liaison in the department in advance so that accommodations may be arranged.

### **ACADEMIC INTEGRITY:**

Integrity of scholarship is essential for an academic community. The University expects that both faculty and students will honor this principle and in so doing protect the validity of University intellectual work. For students, this means that all academic work will be done by the individual to whom it is assigned, without unauthorized aid of any kind. Any student who is caught cheating on a quiz or the final exam will automatically receive a zero and will be reported to the Office of Academic Integrity.

## ***BIMM 101 – Tentative Schedule –FALL QUARTER 2015 - Dr. Jenny Herndon***

	Dates	Experiment	Assignments/ Quizzes	Lab Manual
<b>Wk 0</b>	Sept 25	Organization/safety Dilutions/Graphing		Lab 1
<b>Wk 1</b>	Sept 30	Agarose Gel		Lab 2
	Oct 2	Start Vibrio DNA extraction	<b>QUIZ#1</b>	Lab 3
<b>Wk 2</b>	Oct 7	Finish Vibrio DNA extraction Practice bacteriological techniques		Lab 4
	Oct 9	Quantitate Vibrio DNA using Nanodrop Set up PCR variations	<b>QUIZ#2</b>	Lab 5
<b>Wk 3</b>	Oct 14	Check PCR product on gel and clean-up Set up digest Image J		Lab 6
	Oct 16	Clean up and quantitate digest on gel Ligation of luxAB into pGEM Bioinformatics 1	<b>QUIZ#3</b>	Lab 7
<b>Wk 4</b>	Oct 21	Transform cells PCR presentations Primer Design Exercise	Write-up #1: PCR Results	Lab 8
	Oct 23	Add aldehyde and screen Plan synthetic bio project Start overnights for syn bio	<b>QUIZ#4</b>	Lab 9
<b>Wk 5</b>	Oct 28	Isolate BioBricks plasmids Quantitate plasmids Set up digests	Write-up #2: LuxAB cloning	Lab 10
	Oct 30	Clean up digest /remove stuffer Run gel/Gel Extraction Set up ligation	<b>QUIZ#5</b>	Lab 11
<b>Wk 6</b>	Nov 4	Start bug DNA extraction Transform cells		Lab 12
	Nov 6	Screen colonies Measure fluorescence Check barcode PCR on gel	<b>QUIZ#6</b>	Lab 12
<b>Wk 7</b>	Nov 11	VETERAN'S DAY- NO LECTURE/ LAB		Lab 13
	Nov 13	Observe worms and induce with IPTG Analyze barcode results part 1	Write-up #3: Synthetic Biology Project	Lab 14
<b>Wk 8</b>	Nov 18	Extract RNA from worms and set up RTPCR Analyze barcode results part 2		Lab 15
	Nov 20	Analyze RTPCR results	<b>QUIZ#7</b>	Lab 16
<b>Wk 9</b>	Nov 24	TBA	Write-up #4: RTPCR	Lab 17
	Nov 26	THANKSGIVING- NO LECTURE/LAB		
<b>Wk10</b>	Dec 2	TBA		Lab 18
	Dec 4	Final Exam- in lab		

