Course Description: Physics 498 EBP: Rm 32 Loomis

Experimental Biophysics

Overview

Students in this advanced laboratory course will participate in module-based experiments that involve cutting-edge methods and questions in biological physics. We will explore techniques such as optical imaging with resolution beyond the diffraction limit and high-throughput DNA sequencing. Through these activities, students will explore the methods that have opened the new field of quantitative biophysics and a predictive understanding of topics such as evolutionary and cellular dynamics.

4+4 hours every Tuesday and Thursday 1:00pm – 4:50pm

Following experimental modules covering various aspects of biophysical research will be conducted:

- Polymerase Chain Reaction (PCR)
- Super-resolution fluorescence microscopy
- Optical tweezer
- Luria-Delbruck experiment
- Bacterial phylogenetics

You will be expected to prepare a total of 5 writing lab reports in this course as well as 1 final oral presentation.

Course Grading

Course grading will proceed in compliance with University policy as given in Article 3. Part 1 of the Student Code. Any discrepancies found in your student gradebook should be brought to the attention of your instructor immediately.

Grading

Your final grade for Physics 498 EBP will be based upon your total score on all the components of the course.

	Number of assignments
Lab reports	5
Oral presentation	1

The first report, covering PCR, will be worth 1/3, with the remaining 4 lab reports equal 1 each. The oral presentation will be worth 1.

You will also give an oral presentation at the end of the semester about one of the modules you have in the course. Each group will pick one of the modules and will give a total of 15 minutes talk, followed by 5 minutes discussion. Every group member must contribute equally.

Contact Information

Please use the email addresses listed below if you have any questions about any of the course components.

	Name	Email	Office, tel #
Course Instructor	Prof. Seppe Kuehn	seppe@illinois.edu	331 Loomis; 244-7880
Course Instructor	Prof. Paul Selvin	selvin@illinois.edu	365 Loomis; 244-3371
TA	Laura B. Troyer	ltroyer2@illinois.edu	390H Loomis
TA	Rohit M. Vaidya	rohitmv2@illinois.edu	328 Loomis; 217-904-5690
TA	Yeoan Youn	yyoun4@illinois.edu	328 Loomis; 217-417-8739

Please note the following email rules:

1. Use you official University of Illinois email account.
2. Put "PHYS498EBP" in the subject line and include some words about the subject of your email. For example: "PHYS498EBP: problem with homework."
3. Include your full name in your email message.
4. Please check the schedule to see when assignments are due, and the home page for any announcements.

Office hours

The Professors will hold 1 hour of office hour on Wednesday from 10-11am and by appointment.

On the Tuesday (5-6pm, after the lab is done) before the lab due dates (see below), the TAs will hold office hours.

In general, the lab reports will be due on Thursday at 1:00 pm, 1 week following the end of each lab.

Course Schedule

Week	Date	Day	Activity	Note	Report Due
1	1/21	Tuesday	Introduction MATLAB Forensic PCR	~1:20 lectures	Due: Thurs, Jan 30 Instructor OH: Wed, Jan 29: 10-11am TA OH: Tues, Jan 28: 5-6pm
	1/23	Thursday			
2	1/28	Tuesday	Cycle 1	Group 1: L-D exp Group 2: Phylogenetics Group 3: Fluorescence Group 4: Optical trap	Due: Thurs, Feb 27 Instructor OH: Wed, Feb 26: 10-11am TA OH: Tues, Feb 25: 5-6pm
	1/30	Thursday			
3	2/4	Tuesday			
	2/6	Thursday			
4	2/11	Tuesday			
	2/13	Thursday			
5	2/18	Tuesday	No class for BPS (makeup sessions)		
	2/20	Thursday			
6	2/25	Tuesday	Cycle 2	Group 1: Phylogenetics Group 2: L-D exp Group 3: Optical trap Group 4: Fluorescence	Due: Thurs, Mar 26 Instructor OH: Wed, Mar 25: 10-11am TA OH: Tues, Mar 24: 5-6pm
	2/27	Thursday			
7	3/3	Tuesday			
	3/5	Thursday			
8	3/10	Tuesday			
	3/12	Thursday			
9	Spring Break				
10	3/24	Tuesday	Cycle 3	Group 1: Fluorescence Group 2: Optical trap Group 3: L-D exp Group 4: Phylogenetics	Due: Thurs, Apr 16 Instructor OH: Wed, Apr 15: 10-11am TA OH: Tues, Apr 14: 5-6pm
	3/26	Thursday			
11	3/31	Tuesday			
	4/2	Thursday			
12	4/7	Tuesday			
	4/9	Thursday			
13	4/14	Tuesday	Cycle 4	Group 1: Optical trap Group 2: Fluorescence Group 3: Phylogenetics Group 4: L-D exp	Due: Thurs, May 7 Instructor OH: Wed, May 6: 10-11am TA OH: Tues, May 5: 5-6pm
	4/16	Thursday			
14	4/21	Tuesday			
	4/23	Thursday			
15	4/28	Tuesday			
	4/30	Thursday			
16	5/5	Tuesday	Group presentation and evaluation	15 min presentation + 5 min discussion/ group	
	5/7	Thursday	Reading day		