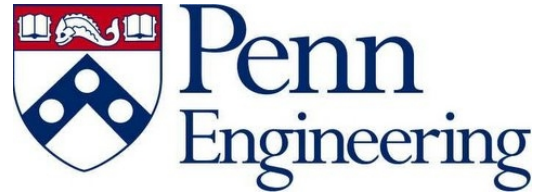


**University of Pennsylvania
Engineering Summer Academy at Penn
Biotechnology Program
July 2016**



Lecture Instructors:	Dr. Sean Holleran Dr. Miriam Wattenbarger	seanholl@seas.upenn.edu mwattenb@seas.upenn.edu
Lab Instructor:	Dr. Robert Bucki	buckirobert@gmail.com
Faculty Advisor:	Dr. Arjun Raj	arjunraj@seas.upenn.edu
CANVAS Site:	canvas.upenn.edu EAS022-2016B: ESAP Biotechnology	
Format:	Lectures 9:00am – Noon (daily) Lab 1:30pm – 4:30pm (daily) Group Research Proposal Journal Club (two days per week) Guest Speakers Field Trips	
Topics:	Prokaryotic and Eukaryotic Cells Chemistry of Cellular Components DNA Replication, Transcription and Translation Proteins and Protein Folding Recombinant DNA Technology Cell Growth Kinetics Protein Separations Bioreactors and Fermentation Drug Delivery	
Requirements:	Two exams on lecture material / journal club / guest speakers Weekly written report and oral presentation for each team Two weekly meetings with graduate student mentor Lab Reports Lab Exam Lab Presentation	
Grade Distribution:	Exams	20% (each exam is 10%)
	Journal Club	15% (participation score)
	Lab	30%
	Research Proposal	35% (3 papers + 3 presentations)

Exams: The exams will cover the content from class lectures, journal club discussions and guest lecture material. The format of each exam will be a mix of multiple choice, true/false, short-answer type questions. Each exam will be a closed book exam.

Exam #1 = Wednesday July 13 (9:00AM)

Exam #2 = Thursday July 21 (9:00AM)

Journal Club: The class will be split into two smaller groups for journal club to facilitate class discussion. An article will be distributed to the class (or posted on the website) at least one day prior to the journal club meeting. The students are expected to read the journal article before class and to be prepared to discuss the article. We will read and discuss four or five articles during the course. The grade is based on class participation.

Lab: Dr. Bucki will direct the afternoon lab with the assistance of the RTAs. The details about the lab, and the lab expectations, will be discussed by Dr. Bucki during the first lab period.

Research Proposal: Students will be divided into teams of three/four students for the research proposal portion of this course. Each student team will be responsible for developing their proposal idea, submitting three drafts of their written proposal, and giving a status-update presentation at the end of each week (including a final presentation on the last day of the course).

Recent journal articles will be used to develop a proposal for a new set of experiments, device, or technique related to biotechnology. The proposal is not only a literature review of current work, but a proposal for a new project based on the current literature. Each group should develop a novel idea that *may* be tested. However, there will be no experimental work done on the project during the class.

More detailed information about this portion of the course is available in the separate *Research Proposal* handout.

Final Comment: Please be aware of *ALL* of your resources for this course - Dr. Holleran, Dr. Wattenbarger, Dr. Bucki, six RTAs, and seven graduate student mentors. We encourage you to talk with any and all of us if there is anything you would like to be done differently. Let someone know if you are having any problems.