

OBJECTIVES

The objective of the course is to provide students with the opportunity to learn basic microbiology and fermentation. The course will meet for three sessions. The first is one day only on a Friday or Saturday. The second and the third sessions are on Fridays and Saturdays. There will be a final multiple choice exam.

Please make sure that on the third Saturday you have limited other commitments since blocks of time will be needed at various times for inoculation, fermentation and harvesting steps.

Lecture & Hands-on	Section 1	Section 2
Session 1	Friday 10:00 am – 3:00 pm	Saturday 10:00 am – 3:00 pm
Lecture 1	Friday 9:30 – 11:30 am,	
Session 2	Friday, 11:30 am – 5:00 pm Saturday, 9:00 am – 5:00 pm	Friday 10:00 am – 3:00 pm Saturday 9:00 am – 5:00 pm
Lecture 2	Friday, 9:30 – 11:30 am, BSB 341	
Session 3	Friday, 11:30 am – 5:00 pm Saturday, 8:00 am – 5:00 pm	Friday, 9:30 am – 3:00 pm Saturday, 8:00 am – 5:00 pm
Session 4	Exam (TBA)	

GRADING

Grades will be based on participation and mastery of techniques (35%), results and notebook (30%), exam (35%).

Session I

Students will work individually to achieve the following:

- Laboratory safety for handling of microorganisms.
- Sterile technique and sterilization
- Preparation of LB or defined medium shake flask growth
- Preparation of LB agar plates and learn how to streak plates (check growth Monday)
- Gram staining of bacteria

Session II

Day one:

- Introduction to the principles of fermentation and flask cell growth
- Hands on preparation and sterilization of the fermentor
- Prepare bacterial seed liquid inoculum for flask growth next day
- Plate bacterial stock culture from beads

Day two:

- Discussion of flask cell growth and results to be obtained
- Growth of one 1 L shaker flasks and monitoring. These measurements need to be taken at 1-hr intervals for a total of 6 hours.
- Harvest cells and freeze to use next week
- Observe results of streaking plates
- Preparation of bacterial stock cultures for storage (beads)

Session III

Day one:

- Fermentation of Recombinant *E. coli* containing the GFP plasmid and bio-processing
- Prepare and sterilize medium in the fermentor and sterilize medium
- Prepare liquid seed inoculum for fermentation

Day two:

- Prepare fermentor for inoculation
- Inoculate both the fermentor and a 1 L flasks
- Monitor a) turbidity b) biomass c) pH d) yield e) purity of growth as judged by Gram staining.
- Extract GFP from cells
- Harvest cells and quantitate yield

Session IV

Exam (multiple choice) (TBA)