

1. Course number and name: BMED 3610 Quantitative Engineering Physiology Laboratory II
2. Credits and contact hours: (1-0-3-2)
3. Prepared by: Essy Behravesh
4. Textbook: None
5. Specific course information
  - a. Catalog description: This lab provides an active learning team environment, incorporating common cell/molecular biology techniques, to reinforce selected engineering principles in an in vitro cell culture setting.
  - b. Prerequisites or co-requisites: BMED 2400 (or ISYE/CEE 3770) BMED 3600 (w/ concurrency)
  - c. Required
6. Specific goals for the course
  - a. Conduct experiments as well as to measure, analyze, and interpret experiment data from cells and cellular structures (Student Outcome 6)
  - b. Understand homeostasis in cellular systems and be able to apply this information to bioreactor design problems (Student Outcomes 1)
  - c. Understand the impact of the variability of biological systems at the cellular level on engineering design (Student Outcome 1)
  - d. Address challenges associated with the interaction between cells and non-living materials and systems (Student Outcome 6)
  - e. In a team, design and conduct an experimental design project, and present the results (Student Outcomes 3, 5, and 6)
7. Brief list of topics to be covered:
  - a. In vitro cell culture
  - b. Microscopy and image analysis
  - c. Reading and analysis of peer-reviewed scientific literature
  - d. Reproduction of experimental results published in the literature
  - e. Use of techniques described in the literature to address a new scientific question
  - f. Design and execution of independent, open-ended hypothesis-driven projects