CHEG 620 – Biochemical Engineering
Fall 2009

Instructors:
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Grading:

Homework (6) 30%
Mid-Term Exam 30%
Final 40%

Late homework cannot be accepted, and absence from exams will result in a grade of zero. Exceptions can be granted only under extenuating circumstances, and on a case-by-case basis. If you have a serious illness and need to postpone an exam, you must submit a formal written request PRIOR to the exam, as well as full documentation from a physician in a timely fashion. If you have a scheduling constraint due to a job interview, we will work with you to schedule the exam around your interview.


Useful reference texts:
1. H. Blanch and D. Clark, Biochemical Engineering
2. L. Stryer, Biochemistry
3. B. Alberts et. al, Molecular Biology of the Cell
4. G. Stephanopoulos, Metabolic engineering: principles and methodologies

Learning Goals:
- Understand the experimental and mathematical frameworks underlying the growth of biological organisms and the production of macro and small molecule products
- Analyze reaction stoichiometry for biochemical processes
- Evaluate different methods for producing biological molecules, including cell culture and protein expression systems.
- Develop strategies for metabolic engineering of biological organisms, to manufacture useful chemicals
- Select and sequence purification processes for biological products
- Design and evaluate drug delivery pathways and tissue engineering methods
- Understand protein and cellular engineering approaches
- Gain an appreciation for the industrial practice of biochemical engineering, as well as its role in the consumer, energy, and biomedical sectors

Lecture Topics
- Introduction/Biotechnology Revolution
- Models of Cell Growth
- Metabolic Engineering
- Cellular Engineering
- Protein Purification and Formulation
- Protein Engineering
- Tissue Engineering/Drug Delivery