

CBEMS 132 BIOSEPARATION PROCESSES

Catalog Data:	CBEMS132 Bioseparation Processes (Credit Units: 3). Recovery and purification of biologically produced proteins and chemicals. Basic principles and engineering design of various separation processes including chromatography, electrophoresis, extraction, crystallization, and membrane separation. Prerequisites: CBEMS40A-B, CBEMS120A. (Design units: 1)
Textbook:	P. C. Wankat, <i>Rate Controlled Separations</i> , Elsevier Applied Sciences, 1990
References:	None
Coordinator:	Juan Hong
Course Objectives:	To apply chemical engineering principles to processing biologically produced products such as amino acids, proteins
Course Outcomes:	Students are able to: Apply chemical engineering fundamentals such as material and energy balance, thermodynamics to design separation processes specific to biologically produced products. Select and design separation processes to isolate, recover and purify valuable products produced from biological processes. Design and analyze filtration processes, centrifugation processes, cell disruption processes, extraction processes, adsorption processes, chromatographic separation processes, precipitation and crystallization processes, ultrafiltration processes, electrophoresis processes.
Prerequisites by Topics:	Material and energy balance, momentum transfer, thermodynamics
Lecture Topics:	Review of thermodynamics, Classification of separation processes Crystallization and Precipitation, Adsorption and Chromatography, Electrophoretic Separation, Membrane Separation , Sequencing Separations
Class Schedule:	Each class meets 4 hours per week for 10 weeks.
Computer Usage:	None
Laboratory Projects:	None
Professional Component:	This course is designed to contribute to the student's knowledge of biology and chemical engineering topics and separation process design.
Relationship to Program Outcomes:	This course relates to Program Outcomes 5, 6, 8, 9 10, 11 and 12 as stated at: http://www.eng.uci.edu/dept/objective_chemical

Design Content Description:

Approach: Lectures and homework on synthesis of separation sequence
Lectures: 5 lectures
Laboratory Portion: None

Grading Criteria:

Homework	20 %
Exam I	40 %
Exam II	40 % (during the final exam period)

**only those who attempted to solve all the homework are qualified for the highest grade.

**Exams are closed note and books.

Estimated ABET Category Content:

Mathematics and Basic Science: 0 credit units or 0%
Engineering Science: 2 credit units or 66.7%
Engineering Design: 1 credit units or 33.3%

Prepared by: Juan Hong

Last Modified: Fall 2002

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