

CBM003 ADD/CHANGE FORM

Undergraduate Council
 New Course Course Change
Core Category: NONE Effective Fall 2007

or

Graduate/Professional Studies Council
 New Course Course Change
Effective Fall

RECEIVED OCT 13 2006

APPROVED JAN 24 2007

- Department: Et College: TECH
- Person Submitting Form: Rupa Iyer Telephone: 713-743-4076
- Course Information on New/Revised course:
 - Instructional Area / Course Number / Long Course Title:
BTEC / 4101 / Principles Of Bioprocessing Laboratory
 - Instructional Area / Course Number / Short Course Title (30 characters max.)
BTEC / 4101 / PRIN OF BIOPROCESS LAB
 - SCH: 3.00 Level: SR CIP Code: 2612010002 Lect Hrs: 0 Lab Hrs: 3
- Justification for adding/changing course: To provide for new discipline areas
- Was the proposed/revised course previously offered as a special topics course? Yes No
If Yes, please complete:
 - Instructional Area / Course Number / Long Course Title:
 / /
 - Content ID: Start Date (yyyy3):
- Is this course offered for undergraduate credit only? Yes No
- Authorized Degree Program(s): BS. Biotechnology
 - Does this course affect major/minor requirements in the College/Department? Yes No
 - Does this course affect major/minor requirements in other Colleges/Departments? Yes No
 - Are special fees attached to this course? Yes No
 - Can the course be repeated for credit? Yes No
- Grade Option: Letter (A, B, C ...) Instruction Type: laboratory
- If this form involves a change to an existing course, please obtain the following information from the course inventory: Instructional Area / Course Number / Long Course Title
 / /
 - Start Date (yyyy3): Content I.D.:
- Proposed Catalog Description credit for or
Cr. (1-0) Prerequisites: EC Concurrent enrollment in BTEC 4301 • Description (30 words max.): Cell culture techniques, principles of bioreactor operation and purification techniques, and calibration and environmental monitoring .

11. Dean's Signature:  Date: 10/12/06
Print/Type Name: Fred D. Lewallen

University of Houston**Proposed Course outline for BTEC 4101, Principles of Bioprocessing lab**

Course Objectives: Students who successfully complete this course will be able to:

- Apply the basic biological concepts that underlie the growth characteristics of bacterial, yeast, and mammalian cells.
- Select and properly use the appropriate instrumentation required to prepare materials for cell culture
- Select and properly use the appropriate instrumentation required to monitor cell culture parameters.
- Apply biochemical concepts to the function of bioreactor components
- Grow cells in a bioreactor including media preparation and bioreactor cleaning, sterilization, aseptic inoculation, operation, monitoring, and cell harvesting
- Apply the basic concepts behind the techniques used to separate proteins.
- Select and properly use the instrumentation required to measure buffer conditions and protein quantity.
- Apply biochemical concepts to protein separation techniques.
- Use current Good Manufacturing practices (cGMP) principles by following Standard Operating Procedures (SOP) and keeping records in Batch Production Record (BPR) format.
- Communicate results and analysis in written and seminar format

Course Outline**Bioprocessing****1. Good Manufacturing Practices**

- a. Introduction to Good Manufacturing Practices as they apply to Biotech industry
- b. Standard Operating Procedures

2. Cell Growth

- a. Introduction to bacterial cells in manufacturing
- b. Scale up from batch to reactor: culture storage and inoculum preparation

3. Bioreactors

- a. Operation

b. Maintenance

4. Upstream processing

- a. Media and buffer preparation
- b. Growing cells

5. Downstream Processing

- a. Filtration
- b. Precipitation
- c. Chromatography
- d. Inactivation
- e. Process Validation

Introduction to Nanobiotechnology

6. Biosensors

- a. Introduction to biosensors
- b. Electrochemical, acoustic, thermal, magnetic, and optical principles of operation. Sensing phenomena, use of physical, chemical and biological laws for sensor development. The use of electrochemical sensor to detect OP hydrolysis