CBM003 ADD/CHANGE FORM

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

☐ Graduate/Professional Studies Council
☐ New Course ☐ Course Change
Effective Fall ______________

1. Department: Et College: TECH

2. Person Submitting Form: Rupa Iyer Telephone: 713-743-4076

3. 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

4. Justification for adding/changing course: To provide for new discipline areas

5. 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): _____

6. Is this course offered for undergraduate credit only? ☒ Yes ☐ No

7. 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

8. Grade Option: Letter (A, B, C...) Instruction Type: laboratory

9. 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.: _____

10. Proposed Catalog Description: Prerequisite: EConcurrent 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
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
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 hydolysis