

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 ____

1. Department: ET College: TECH

RECEIVED OCT 13 2006

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

3. Course Information on New/Revised course:

APPROVED JAN 24 2007

• Instructional Area / Course Number / Long Course Title:
BTEC / 4301 / Principles Of Bioprocessing

• Instructional Area / Course Number / Short Course Title (30 characters max.)
BTEC / 4301 / PRINCIPLES OF BIOPROCESSING

• SCH: 3.00 Level: SR CIP Code: 2612010002 Lect Hrs: 3.0 Lab Hrs: ____

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: lecture

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.: ____

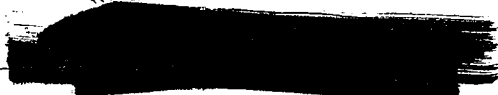
10. Proposed Catalog Description:

2333, and

Cr: (3-0) . Prerequisites: BTEC 2321, BCHS3304/3201, & BIOL 2332/2133 . Description (30 words max.):

Cell culture techniques, principles of bioreactor operation and purification, documentation procedures, important tasks for clean room operations, including sanitization, sterilization, cleaning procedures, 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 BTEC4301, Principles of Bioprocessing

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

- a. Apply the basic biological concepts that underlie the growth characteristics of bacterial, yeast, and mammalian cells.
- b. Understand the principles of upstream and downstream bioprocessing as they apply to the biotechnology industry.
- c. Apply biochemical concepts to the function of bioreactor components.
- d. Understand the process of cell growth in a bioreactor including media preparation and bioreactor cleaning, sterilization, aseptic inoculation, operation, monitoring, and cell harvesting.
- e. Apply the basic concepts behind the techniques used to separate proteins.
- f. Apply biochemical concepts to protein separation techniques.
- g. Apply current Good Manufacturing practices (cGMP) principles by following Standard Operating Procedures (SOP) and keeping records in Batch Production Record (BPR) format.
- h. Describe technologies used to preserve commercial product

Course Content Outline

I) Introduction to Principle of Fermentation

- 1) Basics of cell growth.
- 2) Bacterial, yeast, and mammalian growth curve characteristics.
- 3) Requirements for growing and harvesting bacteria and yeast cells.
- 4) Animal tissue culture.

II) Upstream Processing

- 1) Media components and batching media.
- 2) pH control.
- 3) Dissolved oxygen concentration.
- 4) Osmolarity.
- 5) Carbon dioxide concentration.

III) Downstream processing (Common Separation methods)

Centrifugation
Precipitation
Filtration

Chromatography
Electrophoresis
Batch Absorption

IV) Bioreactors

1. Types
2. Culture techniques: batch, fed-batch, continuous, and perfusion culture.
3. Research, scale up, and production levels of fermentation.
4. Bioreactor operations.

V) Quality control and compliance.

1. Current Good Manufacturing Practices (cGMP) principles and Standard Operating Procedures (SAP) and Batch Production Records (BPR) maintenance.

VI) Storage of Commercial Product

1. Lyophilization
2. Aseptic Filling
3. Storage under Nitrogen
4. Refrigeration/Freezing
5. Use of preservatives

Recommended Text: Moorpark College (2001), Industrial Biotechnology, Thompson Learning