CBM003 ADD/CHANGE FORM

	or	
☒ Undergraduate Council ☒ New Course ☐ Course Change Core Category: <u>NONE</u> Effective Fall <u>2007</u>		☐ Graduate/Professional Studies Council ☐ New Course ☐ Course Change Effective Fall __

1. Department: <u>ET</u> College: <u>TECH</u>

2. Person Submitting Form: <u>Rupa Iyer</u> Telephone: <u>713-743-4076</u>

3. Course Information on New/Revised course:
   - Instructional Area / Course Number / Long Course Title:
     <u>BTEC</u> / <u>4300</u> / <u>Principles Of Bioinformatics</u>
   - Instructional Area / Course Number / Short Course Title (30 characters max.)
     <u>BTEC</u> / <u>4300</u> / <u>PRINCIPLES OF BIOINFORMATICS</u>
   - SCH: <u>3.00</u> Level: <u>SR</u> CIP Code: <u>2612010002</u> Lect Hrs: <u>3.0</u> Lab Hrs: <u>0</u>

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APPROVED JAN 2 4 2007

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): <u>BS, Biotechnology</u>
   - 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: <u>Letter (A, B, C ...)</u> Instruction Type: <u>lecture</u>

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:
    Cr: (3-0). Prerequisites: BTEC 3401, ITEC 2334. Description (30 words max.): This course familiarizes
    students to the principles and practical application of bioinformatics tools in molecular biology and genetics.

11. Dean's Signature: ████████████████ Date: <u>10/12/06</u>

    Print/Type Name: <u>Fred D. Lewallen</u>

University of Houston
Proposed Course Outline for BTEC 4300, Principles of Bioinformatics

Course Objectives: Students who successfully complete this course will be able to:
1) Describe the flow and regulation of biological information
2) Describe the techniques used to collect sequence and express data
3) Describe programming and data structures
4) Identify and used computational tools for extracting biological information from mucleotide and protein sequences.
5) Analyze gene expression and its significance.
6) Manipulate on-line resources appropriately.

Course Outline
1. **Gene Structure and Function**
    a. Storage and expression of genetic information
    b. Structure of prokaryotic and eukaryotic genes
    c. Structure and function of genome
2. **Molecular biology tools**
    a. Restriction Enzymes
    b. Blotting, hybridization , and micro arrays
    c. Polymerase chain reaction
3. **Bioinformatics**
    a. Survey of bioinformatics
    b. The Human Genome Project and High Throughput DNA sequencing
4. **Sequence alignments**
    a. Sequence alignment methods
    b. Multiple sequence alignment
    c. Local and global alignment
5. **Database searching**
    a. BLAST
    b. Entrez
    c. Other sequence database tools
6. **Micro arrays**
    a. Data types
    b. Data analysis
7. **Structure Analysis**
    a. Primary, secondary, and tertiary structure
    b. Tools for protein structure and structure comparison
8. **Whole-genome analyses**
    a. Applications in biotechnology

Recommended Text: A.D. Baxevanis and B.F.F. Ouellette (ed), Bioinformatics: A practical guide to analysis of genes and proteins, 2nd Edition. 2, John Wiley & Sons