

STANDARD MINOR APPROVAL FORM

Title of the proposed minor: Revision to existing campus approved Bioengineering Minor in the College of Engineering

Sponsoring unit: Department of Bioengineering
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Date: November 3, 2006 (Original)
February 6, 2007 (Dept Revisions)

Brief description of the program of study:

The Department of Bioengineering proposes the following revisions to the existing approved Bioengineering Minor in the College of Engineering:

- Eliminate the current specializations within the Bioengineering Minor, Biomedical, Biomolecular, Bioprocess, and Cell & Tissue Engineering.
- Adopt one set of courses as the Bioengineering Minor.
- Replace the sequence of 400 level courses in the curriculum offered by the School of Molecular and Cellular Biology (MCB) with 200 level courses as follows: MCB 401, 402, 403 and 404 replaced by MCB 240, 250, 252, and 253.
- The CHBE Department is midway through the process of having its Biomolecular Engineering Minor approved. In the short interval (if any) between approval of the two minors, we will advertise and accept MCB 450 as the technical elective, which is sufficient for students to satisfy what would have been the biomolecular specialization if CHBE had wanted us to keep it. We will also point students to any information that the CHBE Department wishes to present for advising purposes in this regard.

Requirements:

Hours	Required Courses
1	BIOE 120—Introduction to Bioengineering
3	CHEM 232—Elementary Organic Chemistry I
3	MCB 240—Physiology
3	MCB 250—Molecular Genetics
3	MCB 252—Cells, Tissues & Development
2	MCB 253—Exp Techniqs in Cellular Biol
3	BIOE/ECE 414—Biomedical Instrumentation or BIOE/CHBE 472—Techniques in Biomolecular Engineering
3	Technical Elective ¹
21	Total

1. Course to be selected from a departmentally approved list of 300 and 400 level Bioengineering Related Technical Electives.

Hours	Bioengineering Related Technical Electives
3	BIOE 406—Veterinary Ortho Biomechanics
3	BIOE/ECE 414—Biomedical Instrumentation
3	BIOE/CHBE 472—Techniques in Biomolecular Engineering
3-4	BIOE 475—Modeling of Bio-Systems
3	BIOE 480—Magnetic Resonance Imaging
3	CHBE 471—Biochemical Engineering
3	CHBE 473—Biomolecular Engineering
3	CHBE 474—Metabolic Engineering
3	ECE 473—Fund of Engrg Acoustics
4	MCB 400—Cell Structure and Function
3	MCB 450—Introductory Biochemistry
3	MSE 470—Design and Use of Biomaterials
4	TAM 461—Cellular Biomechanics

Prerequisites for the minor:

The prerequisites impacted by this proposed revision include:

MCB 240 Physiology Prerequisite: MCB 150 (4 hours).

MCB 250 Molecular Genetics Prerequisite: MCB 150.

It should be noted that the current Bioengineering minor includes 300 and 400 level MCB courses. Most of these courses have multiple prerequisites or require concurrent registration in another MCB course. One of the driving factors for revising the Bioengineering Minor is that the availability of new 200 level course offerings in MCB reduces the level of the prerequisite course(s) required. Also, MCB is likely to have difficulty meeting the demand for the 400 level lab course offerings in the future, and believes that the 400 level course offerings will transition to more advanced material. MCB can meet the demand for the 200 level lab courses and believes the enhanced emphasis on molecular biology is appropriate for bioengineers.

Expected enrollment in the minor:

The following details the enrollment in the Bioengineering Minor for the past 6 academic years.

Year	2000	2001	2002	2003	2004	2005
BIOE Minors	30	25	59	80	90	73

Admission to the minor:

The Assistant to the Department Head will monitor the admission process for the Bioengineering Minor. Students who wish to enroll in the Bioengineering Minor curriculum must follow the process outlined by the Office of the Provost regarding the intent to enroll in a campus approved minor. Students must complete the "Statement of Intent to Enroll in a Campus-Approved Minor" and return the signed form to the College of Engineering (COE) Academic Programs Office in room 206 Engineering Hall.

Minor advisor:

The Interim Department Head will serve as the Bioengineering Minor Advisor. The Assistant to the Department Head will serve as the Bioengineering Minor Advisor if the Department Head is unavailable.

Certification of successful completion:

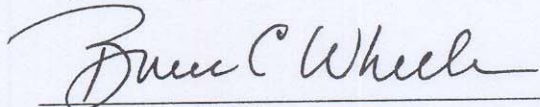
As with the current Bioengineering Minor, the DARS web degree audit system will continue to certify successful completion of the Bioengineering Minor. The revised curriculum will be included in DARS with the appropriate program catalog effective date.

Statement for the catalog: See Attached

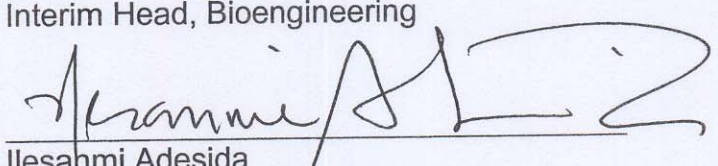
CLEARANCES:

Signature

Date

 11/07/06

Bruce C. Wheeler
Interim Head, Bioengineering

 12/15/06

Ilesahmi Adesida
Interim Dean, College of Engineering

Abbas Aminmansour
Chair, Senate Educational Policy Committee

Statement for Programs of Study Catalog

Bioengineering Minor

Bioengineering is a broad, interdisciplinary field that brings together engineering, biology, and medicine to create new techniques, devices, and understanding of living systems to improve the quality of human life. Its practice ranges from the fundamental study of the behavior of biological materials at the molecular level to the design of medical devices to help the disabled.

Any of the existing engineering programs can provide a good foundation for work in bioengineering. However, the engineering undergraduate needs additional education in the biologically oriented sciences to obtain a strong background for bioengineering. With such a background, the student should be able to progress rapidly on the graduate level in any branch of bioengineering. In industry, the graduate will be competent to handle engineering tasks related to biology.

The Bioengineering Minor is open only to Engineering students including students in the Department of Chemical and Biomolecular Engineering. There is no symmetric program for students whose major is in the College of Liberal Arts and Sciences (LAS). However, students in LAS may wish to inquire about emphases in Bioinformatics & Computational Biology, Biophysics, and Physiology within the School of Molecular and Cellular Biology (MCB)

Students may fulfill the requirements for a minor in bioengineering by completing the following course sequence. Engineering students who are proficient in biology may waive MCB 150 as a prerequisite for courses required in this minor.

Hours	Required Courses
1	BIOE 120—Introduction to Bioengineering
3	BIOE/ECE 414—Biomedical Instrumentation or BIOE/CHBE 472—Techniques in Biomolecular Engineering
3	CHEM 232—Elementary Organic Chemistry I
3	MCB 240—Physiology
3	MCB 250—Molecular Genetics
3	MCB 252—Cells, Tissues & Development
2	MCB 253—Exp Techniqs in Cellular Biol
3	Technical Elective ¹
21	Total

1. Course to be selected from a departmentally approved list of Bioengineering Related Technical Electives.