Student Announcement: Revision of Bioengineering Minor

(Charles Glatz, Director of Bioengineering Minor, 5/30/12)

Subject to approval of the Faculty Senate the F13 Catalog will contain the changes shown below for the Bioengineering Minor requirements. However, you should start using these new requirements now as the earlier required courses of BioE 201 and 202 will not be offered again. Those proposing minors should do so using these requirements. If you are ready to start work on the minor, a suggested start for the coming year would be to take Biol 212 in the Fall and BioE 220X in the Spring.

Below is an annotated version of the expected new catalog material along with descriptions of the required courses. One could summarize the purpose of the changes as giving a strong biomedical engineering focus to the minor. For more details of how to construct a program based on your engineering major, please consult with the member of the Supervisory Committee in your home department.

Current Committee Members: Kaitlin Bratlie (MSE), Gary Mirka (IMSE), Santosh Pandey (ECE), Pranav Shrotriya (ME), Chenxu Yu (ABE), Ian Schneider (CBE), Ashraf Bastawros (AEEM), Hans van Leeuwen (CCEE), and Charles Glatz (Director, CBE)

We welcome your interest in the minor!

Bioengineering

http://www.eng.iastate.edu/bioengineering/

Minor supervised by an interdisciplinary faculty committee, administered by Chemical and Biological Engineering.

The Bioengineering minor is a unique opportunity for engineering students to acquire a multi-disciplinary engineering and life sciences background for entering the field of biomedical engineering.

Undergraduate Study

The program is open to all undergraduate engineering students at Iowa State University. This minor will provide students with a foundation of core biology and engineering relevant to further study in biomedical engineering along with an introduction to the application of engineering principles to biomedical problems from a multidisciplinary perspective as well as the
applications within the majors of the participating departments. Minor requirements are as follows:

A minimum of 16 cr. meeting the six requirements below with a minimum of 9 of those credits not being used to meet degree requirements and a minimum of 6 cr. at the 300 level or above. For most students this last stipulation will probably result in 18 cr. being taken.

BIOL 212  Principles of Biology II  3  Note: You do not need to take 211.
BIOE 220  Introduction to Biomedical Engineering  3  Note: 1st offered S13 as 220X
BIOL 256  Fundamentals of Human Physiology  3  Note: You do not need to take 101
INTRO ENGR ELEC*  3
ADV ENGR ELEC**  3
PROF ELEC***  1-3

* A second (Introductory) engineering course from a department other than that of your major that is not duplicative of material in a course taken in your own department. The topic of the course should have ready application to later BME-related electives in that discipline (MATE 273, EM 274 or 324, CHE 210, EE 201 or 230, or other courses approved by Minor Chair).

** 300-500 level engineering course with clear biomedical engineering application
(BIOE 325, 341, 341L, 352, 411, 428, 450, 450L, 490; CHE 440, 542; MAT E 456; IE 571 or other courses approved by Minor Chair)

*** 300-500 level engineering or life sciences course with clear biomedical engineering application OR BIOE 490 OR departmental 490 with biomedical engineering topic OR 200+ level life sciences laboratory course (N.B. if a 200 level course is chosen here, the student will need to meet the required 6 cr. of 300+ courses by substitution of a higher level course for the other requirements or by taking an additional course) OR 300-500 Level BME courses which may be offered on-line from the University of Iowa.

**Required Course Descriptions and When to Take**

**BIOL 212. Principles of Biology II.** (3-0) Cr. 3. F.S. Prereq: 211
Introduction to the nature of life, including the cellular basis of life; energy relationships; the nature of heredity; evolution; form and function of microbial, plant, and animal life. N.B. It has been established that our students would not need to take Biol 211.

**BioE 220. Introduction to Biomedical Engineering.** (3-0) Cr. 3. S. Prereq: Biol 212, Engr 160 or equiv, Math 166, Chem 167 or 178, Phys 222. Engineering analysis of basic biology and engineering problems associated with living systems and health care delivery. The course will illustrate biomedical engineering applications in such areas as: biotechnology, biomechanics, biomaterials and tissue engineering, and biosignal and image processing, and will introduce the basic life sciences and engineering concepts associated with these topics.

BIOL 256. Fundamentals of Human Physiology. (3-0) Cr. 3. S. Prereg: High School Biology and Chemistry, or BIOL 101, or 255 (recommended)
An introduction to human physiology, studying the function of all body systems. Systems covered include: integumentary, bones and joints, muscles, nervous, sensory, endocrine, circulatory, lymphatic and immune, respiratory, digestive, urinary, and reproductive. Pre-Medical students should consider 335 for their physiology background. Not intended for major credit in biology. N.B. It has been established that our students would not need to take Biol 101.

Order to Take: Ideally you would take 212 then together take 220 and 256 but other tracks could work. Electives could follow at your convenience but pay attention to when offered as most BioE courses are currently only offered every other year.