TO: The Faculty of the College of Engineering

FROM: The Faculty of the School of Biomedical Engineering

RE: Changes in Undergraduate Program Degree Requirements for the Bachelor of Science in Biomedical Engineering

The Faculty of the School of Biomedical Engineering has approved the following changes to the curriculum for the B.S. degree in Biomedical Engineering effective for students entering the Weldon School for the Fall Semester 2013. This action is now submitted to the Engineering Faculty with a recommendation for approval. A revised Suggested Plan of Study is attached. Changes are highlighted.

The proposed change is as follows:

A. Changes are made to the BME Requirements to accommodate recent changes to the College of Engineering General Education Program. Clarification was made to explicitly state that the lists of courses that count towards the general education program are approved by the BME Undergraduate Curriculum Committee
B. The original ethics component of our general education program for BME students has been broadened to include courses addressing ethics and/or medical/healthcare policy.
C. We have also altered the wording to our unrestricted electives.

Reason: The proposed program changes to degree requirements for the Bachelor of Science in Biomedical Engineering are to update the general education program requirements to be consistent with the new College of Engineering General Education Program.

George R. Wodicka, Professor and Head
Weldon School of Biomedical Engineering

[Revised] B.S. BME Degree Program Requirements

Credit Hours Required for Graduation: 130

All required First-Year Engineering courses * must be completed with a C⁻ or above for entry into the BME undergraduate program = 30 credits

*No more than 8 credit hours of freshman calculus can be applied towards the BME degree.

Core Biomedical Engineering (BME) Courses (24 credit hours);
BME 20100, 20400, 20500, 20600, 25600, 29000, 30100, 30400, 30500, 30600, 39000

BME Breadth Requirement (43 credit hours):
Core Life Sciences Requirement: BIOL 23000 and two (2) additional Life Science courses†
= 9 credits
Core Engineering Requirement: ECE 30100; IE 33000 (or Stat 51100), ME 20000, 27000; and MSE 23000 = 15 credits
BME Technical Engineering Electives: Five (5) additional BME or other Engineering courses.†# At most 6 credits at the 300 level; must include at least one 3-credit 400-level BME course; must include at least one 3-credit course chosen from the Quantitative breadth list†. = 15 credits.
Senior Design Capstone Requirements: BME 48800, 48900, 49000 = 4 credits

Advanced Physics and Math (11 credit hours):
PHYS 24100, MA 26100 and (MA 26200 or MA 265 <u>and</u> MA 266)

General Education Program (24 credit hours):
Students must satisfy the requirements of the *College of Engineering General Education Program.* This requirement has two components:
• *Foundational Learning Outcomes:* select from courses approved by the Undergraduate Curriculum Council for the pertinent learning outcomes.
• *Programmatic Requirement:* Includes an ethics or medical/healthcare policy elective to be chosen from the Ethics and Policy List†. All other general education courses must be selected from the list of courses approved by the BME Undergraduate Curriculum Committee†.

Unrestricted Electives (4 credit hours): Unrestricted elective credits intended for curricular flexibility counted towards the total number of credits required for graduation.

GPA Requirement: A minimum Graduation Index of at least 2.0 is required to qualify for graduation with a BSBME. A minimum BME Major GPA** of at least 2.0 is also required to qualify for graduation with a BSBME.
**Courses included in BME Major GPA: BME 20100, BME 20400, BME 20500, BME 20600, BME 25600, BME 29000, BME 30100, BME 30400, BME 30500, BME 30600, BME 39000, BME 48800, BME 48900, BME 49000, ME 20000, ME 27000, MSE 23000, ECE 30100, & IE 33000 (or STAT 51100).

† Selected from a list of courses approved by the Biomedical Engineering Undergraduate Curriculum Committee and maintained by the undergraduate advising office.
# must complete a 400-level BME elective with at least a B- before student can take a BME 500-level course as a technical elective.
Changes are highlighted.

[Revised] Suggested Plan of Study - Effective Fall 2013 <mark>Changes are highlighted</mark>.

Credit hours required for graduation: 130

Freshman Year

First Semester	*Second Semester*
(4) MA 16500 Analytical Geom. & Calc. I	(4) MA 16600 Analytical Geom & Calc. II
(4) CHM 11500 General Chemistry	(4) CHM 11600 General Chemistry
(4) PHYS 17200 Modern Mechanics	(3) CS 15900~ Programming Apps for ENGRS
(2) ENGR 13100 Transforming Ideas to Innov I	(2) ENGR 13200 Transforming Ideas to Innov II
(3) ENGL 10600 Composition	(3) General Education Elective
17	16

Sophomore Year

Third Semester	*Fourth Semester*
(3) BME 20100 Biomolecules: Strct, Funct & Engr Apl	(3) BME 20400 Biomechanics Hard/Soft Tissue
(3) BIOL 23000 Biology of the Living Cell	(3) MSE 23000 Structure & Properties Materials
(1) BME 20500 Biomolec & Cellular Syst Lab	(1) BME 20600 Biomechanics & Biomaterial lab
(1) BME 29000 Frontiers in BME	(3) BME 25600 Physiol Modeling Human Health
(4) MA 26100 Multivariate Calculus	(4) MA 26200+ Lin Algebra & Ordinary Diff. Eq.
(3) ME 27000 Basic Mechanics I	(3) ME 20000 Thermodynamics I
(3) PHYS 24100 Electricity and Optics	17
18	

Junior Year

Fifth Semester	*Sixth Semester*
(3) BME 30100 Bioelectricity	(2) BME 30600 Biotransport Laboratory
(3) BME 30500 Bioinstrumentation Circuit & Meas Princip	(1) BME 39000 Profes Devlp & Design in BME
(3) BME 30400 Biomedical Transport Fundamentals	(3) ECE 30100 Signals and Systems
(3) BME Technical Elective	(3) STAT51100 Statistical Methods
(3) <mark>Gen. Ed. or Ethics/Policy Elective</mark>	(3) BME Technical Elective
15	(3) <mark>Gen. Ed. or Ethics/Policy Elective</mark>
	15

Senior Year

Seventh Semester	*Eighth Semester*
(1) BME 49000 Professional Elements of Design	(3) BME Technical Elective
(1) BME 48800 Preliminary Project Design	
(2) BME 48900 Senior Design Project Lab	(3) BME Technical Elective
(3) BME Technical Elective#	(3) Life Science Elective
(3) Life Science Elective	(3) <mark>General Education Elective</mark>
(3) <mark>General Education Elective</mark>	(3) <mark>General Education Elective</mark>
(3) Unrestricted Elective	(1) Unrestricted Elective
16	16

~CS 15900 is required before junior year and recommended for the first year.

Taken from the list of Quantitative Breadth courses.

+ MA 26500: Linear Algebra **AND** MA 266: Ordinary Differential Equations can be taken separately to meet the MA 26200 requirement.