February 20, 2013

MEMORANDUM

TO: Darryll Pines
    Dean, A. James Clark School of Engineering

FROM: Elizabeth Beise
    Associate Provost for Academic Planning and Programs

SUBJECT: Proposal to Modify the Professional Master of Engineering by Offering the Bioengineering Option Online (PCC log no. 12027)

At its meeting on December 7, 2012, the Senate Committee on Programs, Curricula, and Courses approved your proposal to modify the Professional Master of Engineering by offering the Bioengineering option online. A copy of the approved proposal is attached.

The change is effective Spring 2013. The School should ensure that the change is fully described in all relevant descriptive materials, and that all advisors are informed.

MDC/

Enclosure

cc: William Idsardi, Chair, Senate PCC Committee
    Sarah Bauder, Office of Student Financial Aid
    Reka Montfort, University Senate
    Erin Howard, Division of Information Technology
    Donna Williams, Institutional Research, Planning & Assessment
    Anne Turkos, University Archives
    Linda Yokoi, Office of the Registrar
    Alex Chen, Graduate School
    William Fourney, A. James Clark School of Engineering
    George Syrmos, Office of Advanced Engineering Education
    William Bentley, Fischell Department of Bioengineering
THE UNIVERSITY OF MARYLAND, COLLEGE PARK
PROGRAM/CURRICULUM PROPOSAL

DIRECTIONS:
• Provide one form with original approval signatures in lines 1 - 4 for each proposed action. Keep this form to one page in length.
• Early consultation with the Office of the Associate Provost for Academic Planning & Programs is strongly recommended if there are questions or concerns, particularly with new programs.
• Please submit the signed form to Claudia Rector, Office of the Associate Provost for Academic Planning and Programs, 1119 Main Administration Building, Campus.
• Please email the rest of the proposal as an MSWord attachment to pcc-submissions@umd.edu.

DATE SUBMITTED 10/10/12

COLLEGE/SCHOOL ENGR 01203200

DEPARTMENT/PROGRAM OAEE 1322302

PROPOSED ACTION (A separate form for each) ADD X DELETE ___ CHANGE ____

DESCRIPTION (Provide a succinct account of the proposed action. Details should be provided in an attachment. Provide old and new sample programs for curriculum changes.)

Creation of an online academic option in Bioengineering (MEBI) to the existing Professional Master of Engineering program through the Office of Advanced Engineering Education.

JUSTIFICATION/REASONS/RESOURCES (Briefly explain the reason for the proposed action. Identify the source of new resources that may be required. Details should be provided in an attachment.)

See attached.

APPROVAL SIGNATURES - Please print name, sign, and date

1. Department Committee Chair
   Helen Aranda 11/1/12

2. Department Chair
   William Bentley 11/11/12

3. College/School PCC Chair
   John E. Oden 11/13/12

4. Dean
   W. Louis Roman 11/13/12

5. Dean of the Graduate School (if required)
   W. Louis Roman 11/13/12

6. Chair, Senate PCC
   12/7/2012

7. Chair of Senate

8. Vice President for Academic Affairs & Provost
   Elizabeth J. Hens 2/20/2013

VPAAP 8-05
Proposal for approving an online academic option in Bioengineering to the existing Professional Master of Engineering and Graduate Certificate in Engineering programs through the Office of Advanced Engineering Education

Bioengineering (PMBI and Z054) currently exists as an academic option under the Professional Master of Engineering (ENPM) Program and the Graduate Certificate in Engineering (GCEN) Program. This option was approved in March 2010 and first made available in Fall 2010. The PMBI program was established on campus to allow local and some distance students to take courses with the goal of webcasting selected courses for online delivery and to create a completely online program to meet the high demand of the Bioengineering community. As of the Spring 2012 semester five of the core courses are available for online delivery. The final core course is being offered online and being captured for future delivery this semester (Fall 2012). Two technical electives have also been captured for online delivery. The goal is to continue to develop online courses over the next several semesters to complete the required core and elective courses as students begin the introductory courses already available online.

The high interest in Bioengineering locally and the lack of an equivalent option available from other top engineering schools nationwide necessitate offering PMBI on-line nationally and internationally. In its on-campus form, a student is awarded the Master of Engineering degree in the PMBI option after having completed ten, three-credit courses (six core courses, and four approved technical electives). PMBI courses have been webcast since the Fall 2010 semester via our Distance Education Technology and Services (DETS) Office in the Clark School of Engineering. A student is awarded the GCEN in Bioengineering (Z054) with the completion of four three-credit courses from the prescribed list of approved courses.

Therefore, we propose an on-line option to the existing Professional Master of Engineering program in Bioengineering (MEBI) leading to a Master of Engineering degree and an online option to the existing Graduate Certificate in Engineering program in Bioengineering (Z0##). We will start the fully online option in the Fall 2013 semester by offering a ten course sequence to allow students to complete their degree in two years. The ten courses are predetermined to give the student the depth and expertise for a successful career in the field of Bioengineering. Requests by students to substitute courses from other online programs offered through the Clark School of Engineering will be at the discretion of the MEBI academic advisor, appointment by the Bioengineering Department Chair.

The faculty who teach for the campus program will also teach for the online programs. The standards of good practice observed for the on-campus program will equally apply to the online version. In particular, faculty support and resources for learning will be provided by the DETS office to our on-line students.

Like all of the online academic options offered through OAEE (Fire Protection Engineering, Project Management, Nuclear Engineering, Reliability Engineering, Sustainable Energy Engineering, and Energetic Concepts), these two new on-line Bioengineering options will be administered through OAEE making sure that the necessary student services are provided. All content will be provided by the Bioengineering Department making sure that both commitment to support the programs
and academic excellence are in place. Evaluation and assessment of the programs will be performed by both Bioengineering and OAEE, and their delivery through the DETS Office will ensure a state-of-the-art accessibility of the associated courses.

The proposed schedule of classes for the online program is a subset of courses from the regularly offered courses in Bioengineering. The courses will be offered in a timeline to allow a student to complete the ten courses in two years.

Proposed Online Course Schedule

**FALL 2013**
- BIOE 601 Rate Process in Biological Systems (already offered online, use pre-recorded lectures)
- BIOE 632 Biomedical Optics (already offered online, use pre-recorded lectures)
- BIOE 604 Transport Phenomena in Bioengineering Systems (already offered online, use pre-recorded lectures)

**SPRING 2014**
- BIOE 602 Cellular and Tissue Biomechanics (already offered online, use pre-recorded lectures)
- ENPM 631 Biosensor Techniques (already offered online, use pre-recorded lectures)
- BIOE 612 Physiological Evaluation of Bioengineering Designs (already offered online, use pre-recorded lectures)
- **BIOE 611 Advanced Tissue Engineering (first semester online)**

**SUMMER 2014**
- **BIOE ### Technical Elective TBD**

**FALL 2014**
- BIOE 601 Rate Process in Biological Systems (already offered online, use pre-recorded lectures, re-record to update content at instructor’s discretion)
- BIOE 632 Biomedical Optics (already offered online, use pre-recorded lectures, re-record to update content at instructor’s discretion)
- BIOE 604 Transport Phenomena in Bioengineering Systems (already offered online, use pre-recorded lectures, re-record to update content at instructor’s discretion)
- **BIOE ### Technical Elective TBD**

**SPRING 2015**
- BIOE 602 Cellular and Tissue Biomechanics (already offered online, use pre-recorded lectures, re-record to update content at instructor’s discretion)
- ENPM 631 Biosensor Techniques (already offered online, use pre-recorded lectures, re-record to update content at instructor’s discretion)
- BIOE 611 Tissue Engineering (already offered online, use pre-recorded lectures, re-record to update content at instructor’s discretion)
- **BIOE ### Technical Elective TBD**

**SUMMER 2015**
- **BIOE ### Technical Elective TBD**
- **BIOE ### Technical Elective TBD**