UNIVERSITY OF WASHINGTON

OFFICE OF THE PRESIDENT

January 26, 2010

Dean Matthew O'Donnell
College of Engineering
Box 352180

Dean Paul G. Ramsey
School of Medicine
Box 356350

Dear Matt and Paul:

Based on the recommendation of its Subcommittee on Admissions and Programs, the Faculty Council on Academic Standards has recommended approval of the revised program requirements for a Bachelor of Science in Bioengineering degree. A copy of the changes is attached.

I am writing to inform you that the Department of Bioengineering is authorized to specify these requirements beginning spring quarter 2010.

The new requirements should be incorporated in printed statements and in individual department websites as soon as possible. The *General Catalog* website will be updated accordingly by the Registrar's Office.

Sincerely yours,

Mark A. Emmert
President

Enclosure

cc: Ms. Laura Wright (with enclosure)
Mr. Robert Corbett (with enclosure)
Dr. Deborah H. Wiegand (with enclosure)
Todd Mildon, J.D. (with enclosure BIOEN-20091110)

301 Gerberding Hall • Box 351230 • Seattle, Washington 98195-1230 • 206-543-5010 • FAX: 206-616-1784

DEC 10 2009
OFFICE USE ONLY
Control # BIOEN-20091110

UNIVERSITY OF WASHINGTON

CREATING AND CHANGING UNDERGRADUATE ACADEMIC PROGRAMS

After college/school/campus review, send a signed original and 8 copies to the Curriculum Office/FCAS, Box 355850

For information about when and how to use this form, http://depts.washington.edu/uwcr/1503instructions.pdf

College/Campus Engineering/Medicine	**Department/Unit** Bioengineering	**Date** 11/10/2009

New Programs

- ☐ Leading to a Bachelor of _____ in _____ degree.
- ☐ Leading to a Bachelor of _____degree with a major in _____
- ☐ Leading to a _____ Option within the existing major in _____.
- ☐ Leading to a minor in _____

Changes to Existing Programs

- ☐ New Admission Requirements for the Major in _____ within the Bachelor of _____
- ☐ Revised Admission Requirements for the Major in _____ within the Bachelor of _____
- ☒ Revised Program Requirements for the Major in Bioengineering within the Bachelor of Science.
- ☐ Revised Requirements for the Option in _____within the major in _____
- ☐ Revised Requirements for the Minor in _____.

Other Changes

- ☐ Change name of program from _____ to _____.
- ☐ New or Revised Continuation Policy for _____
- ☐ Eliminate program in _____

Proposed Effective Date: **Quarter:** ☐ Autumn ☐ Winter ☒ Spring ☐ Summer **Year:** 20 10

Contact Person: Laura Wright	Phone: 3-8958	Email: lew3@u.washington.edu	Box: 355061

EXPLANATION OF AND RATIONALE FOR PROPOSED CHANGE

For new program, please include any relevant supporting documentation such as student learning outcomes, projected enrollments, letters of support and departmental handouts. (*Use additional pages if necessary*).

The existing senior capstone project for the BS BIOE consists of BIOEN 481 (an introduction to engineering design) and BIOEN 482, which is an independent project combining research and design, undertaken in a bioengineering faculty lab. With this 1503 form, the Department proposes: 1) maintaining the existing capstone sequence but renumbering it and slightly modifying the credits; 2) adding a new capstone sequence to that separates research and design; and 3) making official two course substitutions that we have consistently approved by petition.

Our existing capstone option has been successful and serves many students well, particularly those bound for graduate school. Some opportunities are being missed, however, and the addition of a second capstone option allows more flexibility for students and faculty alike. Many students are interested in research that cannot easily be made to fit our requirements for a combined research/design course . In addition, we are missing the opportunity to engage students in classis biomedical engineering design projects brought to us by clinicians, industry, Global Health, and other sources. These projects are suitable for groups of students and do not fit within the structure of an independent design/research capstone project.

We propose renumbering the existing capstone sequence for clarity and consistency of numbering within the curriculum. We propose slight adjustments to the number of credits in the existing sequence to better align with actual workload and to make both capstone options equal in credits and overall effort.

Please note that we will leave the existing courses, BIOEN 481 and BIOEN 482, on the books until our SPR 2012, by which time our current sophomores will have been completed their capstone projects. Though it will be an option, we do not anticipate that any student will choose to continue with 481-2. The

proposed changes have been thoroughly vetted by our students, students were involved in the course design, and they are uniformly enthusiastic about the new option and strongly in favor of modifying the number of credits for the existing option, as proposed here.

Changes to the existing sequence
The current sequence is BIOEN 481-482. 482 is an independent culminating design and research project undertaken in a BIOE faculty lab.
BIOEN 481 (4 credits) will become BIOEN 401 (3 credits).
BIOEN 482 (8 credits) will become BIOEN 402 (10 credits).
There are no other changes to either course. Both students and faculty have repeatedly advised us that the # of credits for 481 should be reduced and the # for 482 increased. We also want the total number of credits for either capstone option to match.

Addition of new capstone sequence
We propose creating a new option, 401-403-404-405. In this sequence we separate the research and design requirements. Please refer to new course applications for extensive course details.
BIOEN 401 (3 credits) is taken by all BIOE majors in spring of the junior year. In this course they create a capstone proposal for either 402 or 403. Please refer to new course applications.
BIOEN 403 (4 credits total, 2+2), is a new engineering research project that does not require a design component.
BIOEN 404 and 405 (3 credits each) comprise a new design and build sequence to allow students a group engineering design experience.

We will leave the existing courses, BIOEN 481 and BIOEN 482, on the books until our current sophomores have been graduated. However, the proposed changes have been thoroughly vetted by our students, and in fact students were involved in the course design. We do not anticipate that anyone will choose to continue with 481-2, but the option will remain.

We propose two other minor curriculum changes
1) Approve IND E 315 as an alternative to STAT/Math 390. This has been approved by our curriculum committee and we have been approving IND E 315 by petition for some time. We would like to eliminate the petition process by making the course an official option in our curriculum.
2) Approve AA 260 and CHEM E 325 as alternatives to CHEM E 260. The Chemical Engineering department has phased out CHEM E 260 and replaced it with 325. This is acceptable to our faculty, but right now we must handle it by petition. We would like to eliminate the petition process by making the course an official option in our curriculum. CHEM E 260 is moving to the AA department; that course is also acceptable.

OTHER DEPARTMENTS AFFECTED

List all departments/units/ or co-accredited programs affected by your new program or changes to your existing program and acquire the signature of the chair/director of each department/unit listed. Attach additional page(s) if necessary. *See online instructions.

Department/Unit:	Chair/Program Director:	Date:
CHEM E:	CHEM E: [signature]	CHEM E: 11/16/09
AA:	AA: [signature]	AA: 11/18/09
Department/Unit: IND E:	Chair/Program Director: IND E: RICHARD J. STOREH [signature]	Date: IND E: 11/19/09

CATALOG COPY

Catalog Copy as currently written. Include only sections/paragraphs that would be changed if your request is approved. Please cross out or otherwise highlight any deletions.

General Education Requirements (105 credits):

3. Mathematics (25 credits): MATH 124, MATH 125, MATH 126, MATH 307, MATH 308; ~~STAT 390.~~

Major Requirements (75 credits):

1. Engineering Fundamentals (17 credits): ~~CHEM E 260;~~ CSE 142, CSE 143; E E 215.

2. Bioengineering Core (38 credits): BIOEN 201, BIOEN 301, BIOEN 302, BIOEN 303, BIOEN 304, BIOEN 305, BIOEN 357, ~~BIOEN 402; 8 credits of BIOEN 482~~

PROPOSED CATALOG COPY

Reflecting requested changes (Include exact wording as you wish it to be shown in the printed catalog. Please underline or otherwise highlight any additions. If needed, attach a separate, expanded version of the changes that might appear in department publications). **Please note:** all copy will be edited to reflect uniform style in the General Catalog.

General Education Requirements (105 credits):

3. Mathematics (25 credits): MATH 124, MATH 125, MATH 126, MATH 307, MATH 308; STAT 390 OR IND E 315.

Major Requirements (75 credits):

1. Engineering Fundamentals (17 credits): CHEM E 260, AA 260, OR CHEM E 325; CSE 142, CSE 143; E E 215.

2. Bioengineering Core (39 credits): BIOEN 201, BIOEN 301, BIOEN 302, BIOEN 303, BIOEN 304, BIOEN 305, BIOEN 357, BIOEN 401; 10 credits of BIOEN 402 OR 4 credits of BIOEN 403, 3 credits of BIOEN 404, 3 credits of BIOEN 405

APPROVALS

Chair/Program Director:		Date 11/16/09
College/School/Campus Curriculum Committee	MEDICINE 12/3/2009	Date 11/24/09
Dean/Vice Chancellor: Engineering	MEDICINE 12/7/09	Date 11/25/09
Faculty Council on Academic Standards/ General Faculty Organization/Faculty Assembly Chair:		Date JAN. 22, 2010

POST TRI-CAMPUS APPROVAL (when needed)

Faculty Council on Academic Standards/ General Faculty Organization/Faculty Assembly Chair:	Date

Current:

General Education Requirements (105 credits):

1. *Areas of Knowledge:* 24 total credits in Visual, Literary, & Performing Arts (VLPA) and Individuals & Societies (I&S), with at least 10 credits in each area.
2. *Written and Oral Communication (8 credits):* 5 credits of English composition, from the approved University list; HCDE 231. Additional writing credits are built into the major core courses.
3. *Mathematics (25 credits):* MATH 124, MATH 125, MATH 126, MATH 307, MATH 308; STAT 390.
4. *Natural Science (47 credits):* CHEM 142, CHEM 152, CHEM 162, and CHEM 223 or CHEM 237; PHYS 121, PHYS 122, PHYS 123; BIOL 180, BIOL 200; BIOC 405.
5. *General Elective (1 credit)*

Major Requirements (75 credits):

1. *Engineering Fundamentals (17 credits):* CHEM E 260; CSE 142, CSE 143; E E 215.
2. *Bioengineering Core (38 credits):* BIOEN 201, BIOEN 301, BIOEN 302, BIOEN 303, BIOEN 304, BIOEN 305, BIOEN 357, BIOEN 481; 8 credits of BIOEN 482
3. *Bioengineering Senior Electives (15 credits):* Fifteen credits chosen from BIOEN 420, BIOEN 440, BIOEN 455, BIOEN 457, BIOEN 467, BIOEN 485, BIOEN 490, BIOEN 491, BIOEN 492. One of these courses must be "design-designated" (see department for current list).
4. *Approved Engineering Electives (3 credits):* Three credits of approved engineering electives, chosen from a departmentally approved list or from additional bioengineering senior elective credit. See departmental Web site for approved list.
5. *Free Electives (2 credits).*

Proposed:

General Education Requirements (105 credits):

1. *Areas of Knowledge:* 24 total credits in Visual, Literary, & Performing Arts (VLPA) and Individuals & Societies (I&S), with at least 10 credits in each area.
2. *Written and Oral Communication (8 credits):* 5 credits of English composition, from the approved University list; HCDE 231. Additional writing credits are built into the major core courses.
3. *Mathematics (25 credits):* MATH 124, MATH 125, MATH 126, MATH 307, MATH 308; STAT 390 **or IND E 315**.
4. *Natural Science (47 credits):* CHEM 142, CHEM 152, CHEM 162, and CHEM 223 or CHEM 237; PHYS 121, PHYS 122, PHYS 123; BIOL 180, BIOL 200; BIOC 405.
5. *General Elective (1 credit)*

Major Requirements (75 credits):

1. *Engineering Fundamentals (17 credits):* CHEM E 260**, A A 260, or CHEM E 325**; CSE 142, CSE 143; E E 215.
2. *Bioengineering Core (38 credits):* BIOEN 201, BIOEN 301, BIOEN 302, BIOEN 303, BIOEN 304, BIOEN 305, BIOEN 357, BIOEN 481; 8 credits of BIOEN 482
3. *Bioengineering Senior Electives (15 credits):* Fifteen credits chosen from BIOEN 420, BIOEN 440, BIOEN 455, BIOEN 457, BIOEN 467, BIOEN 485, BIOEN 490, BIOEN 491, BIOEN 492. One of these courses must be "design-designated" (see department for current list).
4. *Approved Engineering Electives (3 credits):* Three credits of approved engineering electives, chosen from a departmentally approved list or from additional bioengineering senior elective credit. See departmental Web site for approved list.
5. *Free Electives (2 credits).*
6. ***Grade Requirements:* Minimum 2.00 GPA in all courses applied to the major with no grade below 2.0 in any of these courses.**