New Academic Program:  
MS/PhD Bioengineering Graduate Program

BACKGROUND

Program Proposed Start Date
Fall 2020

Program Description
This proposal seeks to establish a single (dual-branded) joint graduate program in bioengineering between Oregon State University and the University of Oregon (UO). This proposal extends OSU’s existing bioengineering PhD and MS degree programs to include the UO. The joint graduate program will afford many benefits, including:

- Enhancing student education by tapping broader and deeper faculty expertise in the collaborative development and delivery of educational content,
- Promoting student learning by integrating new pedagogical techniques (hybrid on-line, immersion courses, etc.),
- Building enhanced research collaborations between the two campuses that result from frequent, substantive faculty and student interactions,
- Elevating the joint program’s national brand, rankings and recruiting success by tapping a larger critical mass of faculty mentors and expertise,
- Advancing education and accelerating research progress by sharing complementary educational and research facilities, and
- Improving student employment opportunities through a broader network of external relationships.

The proposed joint program curriculum will include the existing OSU bioengineering core curriculum, as well as a new course to be offered at the UO entitled Innovation and Entrepreneurship. The establishment of the joint program will also give students access to elective courses offered at both universities. In particular, the proposed program will include the following joint activities:

- Students will take seminar courses on both campuses, which will introduce them to faculty and research opportunities available on both campuses.
- There will be an annual conference for students and faculty at which research is showcased. The first of these annual conferences, called the Oregon Bioengineering Symposium, took place at OSU in fall 2019 and included presentations from academic and industry participants from across the state (including OSU, UO and Oregon Health and Science University).
- Students will take a required course on each campus. At the UO, students will take a course called Innovation and Entrepreneurship, which leverages the emphasis on technology translation at the Knight Campus. At OSU, students will take a course called Drug and Medical Device Regulation in Technology Development, which builds on OSU’s longstanding experience teaching this content at the undergraduate and graduate levels. These courses provide practical skills for translation of biomedical technologies that are in high demand in industry, which we anticipate will set our program apart compared to other graduate programs in Bioengineering/Biomedical Engineering.

In summary, the proposed joint program will provide a state-of-the-art training and research environment that prepares graduates to excel in research and development roles in private, government and academic sectors through a combination of technical, innovation,
entrepreneurial and professional training. Students will be able to draw on the combined strengths of the two institutions to tackle the complex, interdisciplinary research challenges in bioengineering and accelerate their progress toward successful careers. Further, participation in a joint program will provide students with real-world experience in multi-site collaboration that will be a hallmark of both academic and private sector research for decades to come.

Program Context
OSU established a new graduate program in Bioengineering in June of 2016 after undergoing a full curricular approval of the proposed new program including the HECC, and with an external review in February of 2016. The first cohort of students was recruited into the program for matriculation in fall 2017. The graduate program currently has over 40 participating faculty, mostly from the College of Engineering, but also from the Colleges of Science, Pharmacy, Public Health and Human Sciences, and Veterinary Medicine. These faculty provide students with the resources and expertise to conduct advanced studies in core areas that include biomaterials, biomedical devices and instrumentation, human performance engineering, medical imaging, and systems and computational biology.

Recently the UO established the Knight Campus for Accelerating Scientific Impact. To date, five new faculty have been hired with research interests that align with bioengineering, and 20 faculty with interest in this area from disciplines such as Biology, Chemistry, Physics, and Molecular Biology have been recruited as Associate Members of the campus. There are plans to hire at least 10 more Knight Campus faculty members in the next few years. Core areas in bioengineering will include regenerative medicine, biomechanics, neuroengineering, biosensors, biomaterials complemented by new innovation and entrepreneurship programs and training.

We propose to expand the existing OSU Bioengineering graduate program to give students access to faculty and coursework at both OSU and UO. The result will be a single (dual-branded) joint OSU/UO Bioengineering graduate program. Students will be able to earn a PhD or MS from both institutions through the joint program. The Bioengineering MErg will remain an OSU only degree. The universities will recruit the students jointly, share in the training of each cohort through a common curriculum and provide cutting-edge graduate thesis research opportunities at both campuses. The value proposition of this expansion into a joint Bioengineering graduate program is bringing to bear the strengths and complementary core areas of the two institutions – in the process creating a unique research and training experience for students.

On the national landscape, several highly ranked bioengineering graduate programs utilize a similar approach to combining outstanding faculty and resources to enhance research and graduate training impact in this still evolving discipline. Exemplars include the Georgia Tech & Emory University joint PhD Program in Biomedical Engineering (ranked #3 by US News and World Report), the UCSF-UC Berkeley Joint PhD Program in Bioengineering (ranked #5), and the University of North Carolina at Chapel Hill and North Carolina State University Joint Graduate Program in Biomedical Engineering (ranked #33). Each of these programs demonstrate multiple synergies that occur via strategic partnerships, particularly when institutions with different, but complementary, foci combine.

Program Purpose/Relationship to University Mission and Strategic Plan
The proposed joint UO/OSU Bioengineering graduate program will support the mission and goals of OSU and UO through education, research and service by providing graduates with interdisciplinary training in bioengineering. The joint program will support a number of aspects of the strategic plans of both institutions, including creation of new and transformative courses and programs enabled by a unique partnership of regional research institutions that can serve as a
model for future expansion of both this program and others in the future.

The proposed program will create an organizational infrastructure to facilitate development of a community of students and faculty across bioengineering and other life sciences units on the OSU and UO campuses. It will be complementary to existing graduate programs focusing on health sciences, molecular/cellular biology, chemistry, human physiology, pharmacy and other bioscience-based fields, and is expected to synergistically bolster these programs through enhanced interdisciplinary collaboration.

Need for the Program

The Oregon Bioscience Association recently released a report highlighting the importance of the Bioscience Industry to the Oregon economy. Oregon has over 800 life science companies that employ over 14,000 workers that earn over $1 billion in wages, directly contributing nearly $6 billion to Oregon’s economy in 2017. The bioscience industry has grown steadily from 2002 to 2017, adding 4,800 jobs, an increase of 77%. In addition to job creation, the industry was responsible for bringing nearly $289 million in National Institutes of Health funding to Oregon institutions in 2015 alone.

The joint UO/OSU bioengineering graduate program will create highly trained graduates that these companies will need to sustain the growth of the bioscience industry in Oregon. Overall, we expect that creation of the joint UO/OSU bioengineering graduate program will lead to growth of bioscience-based industries in Oregon through development of new technologies and strengthening of the bioengineering workforce.

Program Financials

Projected Enrollments: The first cohort of students in the joint program will matriculate in fall 2021. We expect an initial cohort of about 15 students. As the program matures and faculty recruitment continues, these numbers will grow. We anticipate that the joint program will matriculate an average of 25-30 PhD students/year and support a graduate student body (PhD and MS) of 120 within 10 years.

Instructional Faculty and Support Staff: The transition to the joint OSU/UO graduate program will not result in new courses to be delivered at OSU, so no additional FTE will be required for delivery of coursework.

We already have a 1.0 FTE graduate program coordinator in place in the School of Chemical, Biological, and Environmental Engineering (CBEE), who manages recruitment, advising and other activities for coordination of the bioengineering graduate program (as well as the two other graduate programs in CBEE). She will continue to serve as graduate program coordinator for the joint OSU/UO bioengineering graduate program. Since the graduate program coordinator is already in place and no additional costs are expected for transition to the joint program, the cost of the graduate program coordinator is not included in the budget table below.

Beginning in August 2019, a formal director position was created for the Bioengineering graduate program. This position comes with 0.2 FTE for the full year (including summer). The duties of the director include efforts to establish the new joint OSU/UO graduate program and to manage the joint program after it is approved. After the new joint program is established and running smoothly, the director will transition to 0.1 FTE.

The transition to the joint OSU/UO graduate program is not expected to result in increased costs associated with the library or capital equipment needs. We are anticipating a modest increase in the costs for marketing and promotion of the new program. The College of Engineering has
committed to support these efforts with $25,000 to be used in FY2020, $25,000 for FY2021 and $10,000 each year thereafter.

The budget is summarized in the table below.

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<th>Personnel</th>
<th>Academic Year 2020-21</th>
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<th>Academic Year 2022-23</th>
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<td>TOTAL COST OF PROGRAM</td>
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**RECOMMENDATION**

All appropriate university committees and the OSU Faculty Senate have positively reviewed the proposed program. The Provost recommends that the Board approve the establishment of the OSU/UO joint graduate program in Bioengineering, effective fall 2020, pending the support of the Statewide Provosts Council and the approval of the Higher Education Coordinating Commission.