

Proposal for a Joint Graduate Program in Bioengineering

Proposing universities: Oregon State University and the University of Oregon

This proposal seeks to establish a single (dual-branded) joint graduate program in bioengineering between Oregon State University and the University of Oregon by extending OSU's existing degree program to include the UO as a new location. The additional location at UO will include a PhD and M.S. in Bioengineering. The joint graduate program will afford many benefits relative to establishing independent programs on each campus. These benefits include:

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

Brief description of the existing and anticipated programs

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 for recruitment include regenerative medicine, biomechanics, neuroengineering, biosensors, and biomaterials. The Knight Campus will complement faculty expertise with new innovation and entrepreneurship programs and training in order to facilitate translation of discoveries.

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 or earn an M.Eng. through OSU. 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, highly ranked programs such as the Georgia Tech & Emory University joint PhD Program in Biomedical Engineering, and the UCSF-UC Berkeley Joint PhD Program in Bioengineering utilize a similar approach to combining outstanding faculty and resources to enhance research and graduate training impact in this still evolving discipline.

Program location and modality

The new programming to complement OSU's existing program will be located at the UO in Eugene. It will be delivered through a combination of face-to-face lectures, immersive problem-based learning experiences and hands on laboratory work. UO and OSU plan to enhance offerings at both campuses by offering hybrid on-line courses that will engage students at both campuses.

Graduate training and mentoring will be conducted at both campuses. It is anticipated that, through joint training and mentorship activities, partnerships between the faculty at the campuses will grow and support collaborative research between the campuses. There are already agreements in place to share research resources such as capital-intensive research infrastructure. Given the interdisciplinary nature of bioengineering, the ability to share expertise in life science, materials science, engineering, innovation and entrepreneurship across the campuses will enhance training for all joint students.

Anticipated start date

The existing program at OSU is underway. We hope to have the program approved in time for existing OSU students to have access to the joint program starting in the fall of 2020. We would begin recruiting efforts in the fall of 2020 for the first new cohort of students for the joint program, matriculating in the fall of 2021.

Anticipated enrollment, at launch and goals for 5 and 10 years out

At launch in fall 2021, we expect an enrollment cohort of 15 students in the joint program. 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.

Statewide needs and goals & alignment with the UO's mission and strategic plan

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%.¹ 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. In addition to job creation, the industry was responsible for bringing nearly \$289 million in NIH funding to Oregon institutions in 2015 alone.

The proposed joint UO/OSU Bioengineering graduate program will support the mission and goals of UO and OSU 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. In addition, 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.

¹ See: <https://www.oregonbio.org/wp-content/uploads/2019/07/Oregon-Bio-Final-FULL-Report-2019-1.pdf>