Docket Item:
University Program Approval for a New Location: Oregon Tech Bachelor of Science (B.S.) degree program in Mechanical Engineering

Summary:
Oregon Tech proposes a new location in Wilsonville, Oregon to offer its existing program leading to a B.S. degree in Mechanical Education. Higher Education Coordinating Commission (HECC) staff completed a review of the proposed new location of the program. After analysis, HECC staff recommends approval of the new location for the program as proposed.

Staff Recommendation:
The HECC staff recommend the adoption of the following resolution:

RESOLVED, that the Higher Education Coordinating Commission approve the following:

Oregon Tech Bachelor of Science (B.S.) degree program in Mechanical Engineering may be offered in Wilsonville, Oregon.
Oregon Tech seeks approval from the Oregon Higher Education Coordinating Commission to offer an existing B.S. in Mechanical Engineering degree program at its Wilsonville campus.

1. Describe the purpose and relationship of the proposed program to the institution’s mission and strategic plan.

Taken from the 2020 Strategic Action Plan for the Oregon Institute of Technology (Oregon Tech), the institution mission statement reads: “Oregon Institute of Technology, the Northwest’s premier public polytechnic university, offers innovative and rigorous applied-degree programs in the areas of engineering, engineering technologies, health technologies, management, and the arts and sciences. To foster student and graduate success, the university provides an intimate, hands-on learning environment, focusing on application of theory to practice. Oregon Tech offers statewide educational opportunities for the emerging needs of Oregon’s citizens, and provides information and technical expertise to state, national, and international constituents.”

Concurrent with this statement are a set of core themes that characterize the purpose and function of Oregon Tech as a public institution of higher education: Applied Degree Programs; Student and Graduate Success; Statewide Educational Opportunities; and Public Service. This proposal, to deliver an existing degree program at a new location, is in direct alignment with both the mission statement and the core themes of Oregon Tech; in particular, offering applied degree programs and ensuring statewide educational opportunities.

The Bachelor of Science in Mechanical Engineering (BSME) degree program at Oregon Tech was developed by the Manufacturing & Mechanical Engineering & Technology (MMET) Department, and it was initially (and is currently) offered at the Klamath Falls campus. It is also offered (via a contractual agreement) to eligible employees of the Boeing Company in the Puget Sound (Seattle) region of Washington state. It is proposed to offer this ABET EAC-accredited program at the Oregon Tech Wilsonville campus. The curriculum for the Wilsonville program would be the same as structured in Klamath Falls and Seattle, and the program would be accredited through ABET by extension (from Klamath Falls, regarded as the “parent campus”).

The existing BSME program at Oregon Tech is an applied engineering program that instills in graduates the knowledge, skills, and confidence needed for successful careers in the field of mechanical engineering. The department also offers an option whereby students can earn concurrent degrees in mechanical engineering (the BSME) and manufacturing engineering technology (the BSMFG). This option will be preserved for Wilsonville students since the BSMFG degree is already available at that campus. The degree program proposed for Wilsonville also reflects and supports three of the five strategic goals identified in the 2020
Strategic Action Plan by expanding opportunities for students pursuing mechanical engineering studies and careers in the South Portland and Salem regions: Goal #1 – Student Success; Goal #3 – Economic and Workforce Connections; and Goal #4 – Student Access and Diversity.

2. What evidence of need does the institution have for the program?

Evidences of a need for a BSME degree program to be offered and delivered at the Oregon Tech Wilsonville campus include:

- Suggestions from the Industry Advisory Board (IAB) for the MMET Department, who has received feedback from companies seeking BSME graduates from programs with greater emphasis placed upon application of engineering knowledge and skills.
- Requests for alternative class schedules (including evening and weekend offerings) from potential students working full-time in the South Portland and Salem regions.
- Requests from currently-enrolled mechanical engineering technology students at the Wilsonville campus, who would prefer to obtain a BSME degree instead of a BSMET degree. A BSME degree will generally afford greater employment and career options.
- Requests from currently-enrolled renewable energy engineering students at the Wilsonville campus (over 150 students), who desire to simultaneously pursue a mechanical engineering major, eventually obtaining dual BS degrees.
- Changes in the requirements for engineers-in-training to become registered/licensed (professional) engineers in an increasing number of states now expect candidates for licensure to have graduated from an ABET EAC-accredited program such as the BSME degree program proposed for delivery in Wilsonville.

3. Are there similar programs in the state? If so, how does the proposed program supplement, complement, or collaborate with those programs?

Portland State University (PSU) offers a B.S. in Mechanical Engineering degree program, but its program has more of a theoretical emphasis, as PSU also offers M.S. and Ph.D. programs, so it is to be expected that PSU prepares its undergraduates differently than Oregon Tech. Furthermore, PSU usually does not schedule undergraduate courses (for the BSME degree) during evenings or weekends. The BSME degree program proposed by Oregon Tech will complement the program at PSU because it will be delivered as an applied degree program for potential students who are interested in immediate employment as an engineer following graduation. And by offering a non-traditional schedule of classes, it also will expand opportunities for many students who have significant constraints on their available time for attending classes and meeting with instructional personnel.

Another complementary advantage of the proposed program is that students enrolled in BSME programs at PSU or Oregon Tech can take substantially equivalent or special elective courses at the other institution to assist in degree completion for cases involving class conflicts or course prerequisite deficiencies. It is of further benefit that students completing
the BSME program at Oregon Tech who are interested in pursuing a traditional M.S. degree program in Mechanical Engineering will have that option available at PSU. Thus, the new program at Oregon Tech can serve to enhance matriculation into this M.S. program at PSU.

Oregon Tech already offers an ABET-accredited B.S. in Mechanical Engineering Technology (BSMET) degree program at the Wilsonville campus. While the BSMET program is similar to the BSME program, there are significant differences. The BSMET program is less rigorous and intensive in mathematics and the physical sciences than the BSME program; the BSMET program is even more applied in nature, and graduates from this program typically pursue different career paths. The BSME program is characterized by an increased emphasis on the knowledge and skills required for heavy analysis and design activities, which are hallmarks of mainstream engineering efforts.

Assuming that the BSME program receives final approval for delivery at the Wilsonville campus, the BSME and BSMET programs would be available at all three locations served by MMET Department programs: Klamath Falls, Wilsonville, and Seattle. It is then natural to pose the question as to why the BSMET program should continue to be offered at each of these locations. The BSMET program is an alternative for mechanically-inclined students with a more ‘hands-on’ focus, and it also functions as a safety net for students who begin their studies in the BSME program but become overwhelmed by its rigorous nature. Thus, the BSMET program assists in retaining students and promotes their degree completion.

4. What new resources will be needed initially and on a recurring basis to implement the program? How will the institution provide these resources? What efficiencies or revenue enhancements are achieved with this program, including consolidation or elimination of programs over time, if any?

Based upon interests expressed by regional employers and the desires communicated by prospective students, the proposed program is expected to grow to 100 students over the next six years and to annually produce about 20 to 25 BSME program graduates when it is fully developed and implemented. At present, no enrollment limitations are envisioned. Because of common courses offered for the existing BSMET and BSMFG programs, along with several other courses offered to support the BSREE program offered by the Electrical Engineering & Renewable Energy Engineering (EERE) Department, about 70% of the courses comprising the BSME program are already delivered at the Wilsonville campus. However, it is likely that some of these courses will need to be offered in concurrent sections or during several terms of an academic year in order to meet the anticipated increase in enrollment. Accordingly, several faculty members are expected to be added during the initial years after the launch of the BSME program.

Through an agreement recently reached with the Northwest Collaboratory for Sustainable Manufacturing (NWCSM), two new faculty members will be acquired whose responsibilities consist of: 50% to support the BSME program, 50% to conduct applied research in support of the NWCSM; the NWCSM will provide the funding to cover these positions. Furthermore,
a new BSME Program Director (who will also teach courses) for the Wilsonville campus will be installed, whose position will be funded from institutional resources. Currently, two full-time MMET faculty at the Wilsonville campus exclusively support the existing BSMET and BSMFG programs (along with a cadre of adjunct instructors). As the BSME program grows, it is quite possible that the other programs may diminish, as most prospective students are indicating a desire to enroll in the new BSME program. So it is expected that a significant portion of the efforts of these two faculty eventually will be redirected to support the BSME program. Initially, additional non-instructional staff should not be needed. The existing staff currently in place at the Wilsonville campus should be adequate to support the new BSME program, which include course-laboratory and information-technology technicians along with other support personnel for advising, registering, tutoring, and serving students.

No additional buildings will be required to deliver the new BSME program. Several existing laboratory facilities, which currently support the existing BSMET and BSMFG programs, will be exploited to support the BSME program. Some of these facilities are also utilized for the delivery of courses/programs by the EERE Department. These laboratory facilities cover: Electrical Power Systems, Instrumentation and Control Systems, Heat Transfer and HVAC Equipment, Mechanics and Properties of Materials, Robotics and Mechanical Vibrations, CNC Machine Tools/Centers, and Solid Modeling and FEA Software. An additional instructional resource will be required to support the BSME program, which involves a laboratory for exploring fluid mechanics phenomena and applying fluid power systems. It is possible that this capability could be combined with an existing facility, or placed in a dedicated workspace. As should be expected, some additional equipment for this laboratory will need to be purchased (at a moderate cost). Because classrooms, faculty, adjunct instructors, and support staff are already available at the Wilsonville campus, no significant budgetary impact from program implementation is expected; it will be predominantly financed through existing resources and the subsequent revenue it would generate. Additional resources will be sought to periodically improve the laboratory facilities, but no grant funds will be required to launch the proposed program.

Finally, upon approval to proceed, the MMET Department must submit a request to ABET for an extension of the BSME program to the Wilsonville campus, as was done for delivery of the program in Seattle. This process involves generating a lengthy report which is based upon the self-study report for the existing BSME program in Klamath Falls and Seattle, and it could take as long as a year to obtain an approval from ABET.

All appropriate University committees, the Oregon Tech Board of Trustees, and the Statewide Provosts Council have positively reviewed and approved this proposal to offer and deliver an existing degree program at the new location identified.

**Recommendation to the Commission**
The Statewide Provosts Council recommends that the Oregon Higher Education Coordinating Commission authorize Oregon Tech to offer and deliver the B.S. in Mechanical Engineering degree program at its Wilsonville campus, effective Fall 2016.
Institution: Oregon Tech
Program: New Location – B.S. in Mechanical Engineering in Wilsonville

Action: At the November 5, 2015 meeting, the Statewide Provosts Council approved Oregon Tech to offer and deliver their B.S. in Mechanical Engineering program at its Wilsonville campus, to move forward to the Oregon Higher Education Coordinating Commission for its review/approval. All eight university provosts approved the new location program. Oregon Tech Board of Trustees approved it at their December 15, 2015 meeting.

Eastern Oregon University
Sarah Witte, interim provost
X Approved
__Opposed
__Abstained

Oregon State University
Sabah Randhawa, provost
X Approved
__Opposed
__Abstained

Portland State University
Sona Andrews, provost
X Approved
__Opposed
__Abstained

University of Oregon
Scott Coltrane, provost
X Approved
__Opposed
__Abstained

Oregon Health & Science University
Jenny Mladenovic, provost
X Approved
__Opposed
__Abstained

Oregon Tech
Brad Burda, provost
X Approved
__Opposed
__Abstained

Southern Oregon University
Susan Walsh, interim provost
X Approved
__Opposed
__Abstained

Western Oregon University
Steve Scheck, provost
X Approved
__Opposed
__Abstained