Oregon Institute of Technology seeks Board approval to offer an instructional program leading to a M.S. in Renewable Energy Engineering.

OREGON INSTITUTE OF TECHNOLOGY – M.S. IN RENEWABLE ENERGY ENGINEERING

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

The proposed Master of Science in Renewable Energy Engineering (MSREE) supports the institutional mission of Oregon Institute of Technology (OIT) by addressing each of the University’s mission statement central objectives approved by the Oregon Board of Higher Education. The proposed degree program aims to prepare engineering graduates for the rapidly-evolving renewable energy industries in Oregon, the Pacific Northwest, and beyond. Graduates will have a fundamental understanding of energy engineering in all its practices—energy systems efficiency, conversion, design, and applications. The program is designed to prepare students for the challenges of designing, promoting, and implementing renewable energy engineering solutions. The MSREE program comprises multiple renewable energy engineering tracks, each consisting of three courses spread over three terms. These tracks allow students to study specific renewable energy engineering topics in depth while at the same time exposing them to an array of energy engineering topics. Students also follow a three-course track focused on research methods and innovation and complete M.S. level applied R&D. All of these tracks are dependent upon students having a strong foundation in electrical and mechanical engineering, so the program also offers two ramp-up tracks, one in mechanical engineering and the other in electrical engineering for students deficient in either discipline.

Program graduates will enter energy careers as power engineers, PV/semiconductor processing engineers, facilities and energy managers, energy system integration engineers, HVAC and hydronics (M/E/P) engineers, electrochemical systems engineers, design and modeling engineers for net-zero energy buildings, LEED accredited professionals (AP), biofuels plant and operations engineers, energy systems control engineers, power electronics engineers, utility program managers, as well as renewable energy planners and policymakers. Graduates of the program will be able to pursue a wide range of career opportunities, not only within the emerging field of renewable energy, but within more traditional areas of energy engineering as well.

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

In 2005, OIT furthered its commitment to renewable energy, energy-efficiency by introducing the first Bachelor of Science in Renewable Energy Systems in North America—now known as the Bachelor of Science in Renewable Energy Engineering (BSREE). Due to its
academic relevance, demand, and industry needs, in only four years the BSREE program increased enrollment from 4 students to over 225 students, becoming the largest engineering program offered at OIT. Students from more than 25 states have moved to Oregon specifically to earn the BSREE degree. A significant number of students attracted to the BSREE program already hold bachelor of science degrees in various disciplines, including mechanical engineering, electrical engineering, physics and chemistry. These students would be better served with a master of science degree as opposed to a post-bachelor. OIT receives constant inquiries from prospective students about the availability of a master of science degree in renewable energy engineering. Additionally, the local energy industry has expressed significant interest in graduate-level energy engineers with strong competencies in renewable energy solutions. For these reasons, OIT proposes the creation of the first Master of Science in Renewable Energy Engineering in North America.

Renewable energy resources are attracting considerable investment as concerns surrounding the stability of energy supply, increased energy costs, and environmental considerations have continued to challenge the status-quo of national and state energy policies. As a result, the various renewable energy engineering industries are growing rapidly, resulting in a great need for qualified energy engineering expertise. Significantly, in Oregon, aggressive policies from the Governor’s office have spurred the development of sizeable renewables-related industries, particularly wind power, solar, and energy-efficient buildings using renewable resources. For example, some dynamic companies, such as Vestas Wind Systems (Denmark), REpower (Germany) and Iberdrola (Spain, formerly PPM), have chosen to set up their national headquarters in Oregon, while other renewable industry companies are developing a strong presence in Oregon.

Numerous letters of support from leading Oregon companies and institutions including the Energy Trust of Oregon, PGE, Vestas, and the BPA have documented the need for this type of graduate degree in Oregon. The needs of Oregon have been changing rapidly over the past decade, and the MSREE program, by design, meets the social, economic, and environmental challenges directly faced by Oregonians today and in the future. To date, these changes have presented Oregonians with a myriad of opportunities to develop expertise in specific niche industries such as energy-efficient buildings, power electronics, fuel cells, biofuels such as biodiesel and ethanol, forestry biomass resources, wave power, and micro-hydroelectric power, to name a few. These new industries are helping Oregon diversify its economic base by addressing a fundamental need of all societies: the sustainable use of energy resources.

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

There are no programs like the proposed MSREE at any of the universities that are part of the Oregon University System (OUS). As is the case with OIT’s BSREE, the proposed MSREE degree achieves maximum differentiation with respect to currently available engineering degrees offered by OUS institutions.
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?

OIT has secured a $2.5 million grant from the Department of Energy that supports the MSREE program by providing significant lab resources and additional faculty. The External Review Panel gave a positive evaluation and identified strengths in each of the four categories required for the start of a new graduate program, namely program design, faculty, need, and resources (“...elements are sufficient and adequate to launch the MSREE program when deemed appropriate by the institution.”)

All appropriate University committees and the OUS Provosts’ Council have positively reviewed the proposed program.

RECOMMENDATION TO THE COMMITTEE

The OUS Provosts’ Council recommends that the Board’s Academic Strategies Committee authorize Oregon Institute of Technology to establish an instructional program leading to a Master of Science in Renewable Energy Engineering, effective Fall 2011. With Committee approval, a five-year follow-up review of this program will be conducted in 2016-17.

(Committee action required.)