Bachelor of Science, Software Engineering

Executive Summary

OSU-Cascades proposes the creation of a new four-year degree program in software engineering. The program meets a significant market demand, enhances the portfolio of programs within the College of Engineering, demonstrates innovative curriculum design, and reflects the mission and values of Oregon State University.

The software engineering degree offers a more focused experience than the general computer science degree, emphasizing the *process, technologies, tools, methodologies, design, architecture and theory of building long-lasting, scalable software systems*. The proposed software engineering program achieves its learning outcomes through an innovative, team-based, project-driven curriculum delivering a cohesive four-year learning experience. Compared to the general computer science degree, which covers a broad variety of topics, the software engineering degree provides a more specialized learning experience. Briefly, the learning experience is summarized as:

* **Year one, introduction**: students collaborate in teams on an end-to-end software system that solves a real-world problem with a real client.
* **Year two, data**: students iterate on the team project, focusing on data acquisition, management, visualization, analysis, statistics, and data science.
* **Year three, operations**: students iterate again, focusing on scalability, automation, and security. They make the transition into computer science fundamentals; they begin taking topical CS courses.
* **Year four, entrepreneurship**: students iterate again, focusing on the business of software, entrepreneurship and innovation, as well as complete more CS electives for added depth of content knowledge.

The program also incorporates a multi-year apprenticeship model, service learning component, and colloquium series.

While related to computer science, software engineering represents a distinct body of knowledge recognized by IEEE and ACM. In addition, ABET has separate accreditations for computer science and software engineering.

Local, state, national and multi-national companies have expressed feverish interest in this program at OSU-Cascades. The proposal includes letters of support from over fifty software companies in Central Oregon, large tech companies in Oregon, such as Intel and HP, and multinational companies such as Apple. Support also includes endorsement from the Association of Computing Machinery, world-recognized software engineering practitioners, and from programs at other institutions of higher education.

The proposal narrative describes the curriculum, alignment with the regional needs and OSU’s mission, context among other Oregon state programs, evidence of demand, impacts, risks, opportunities and some suggestions on executing the launch of this new, innovative program in software engineering.