Computer Science and Engineering Program Review 2018-19

Closing MOU

Date: August 22, 2019

Overview

Degree/Certificate Programs Reviewed:	Bachelor of Science in Computer Science and Engineering Master of Science in Computer Science and Engineering Ph.D. in Computer Science
Department Chair & Dean:	Eelke Folmer, Chair; Manos Maragakis, Dean
External Reviewers & Affiliation:	Undergraduate: Dr. Brian J. Swenty, College of Engineering and Computer Science, University of Evansville, Accreditation Board for Engineering and Technology (ABET) Chair Dr. Mark Osborn Federle, Academic Affairs, Marquette University, Accreditation Board for Engineering and Technology (ABET) Chair Dr. Jean Ragan Stephenson Blair, United States Military Academy, Accreditation Board for Engineering and Technology (ABET) Chair Dr. Russell Deaton, University of Memphis, Accreditation Board for Engineering and Technology (ABET) Dr. Shakil Akhtar, Clayton State University, Accreditation Board for Engineering and Technology (ABET) Graduate: Dr. Martin Berzins, School of computing and Science Computing and Imaging Institute, University of Utah Dr. Hank Childs, Department of Computer and Information Science, University of Oregon
Date of External Visit:	September 17-19, 2017 and April 1-2, 2019

Review Process Summary

The Computer Science and Engineering program was scheduled for regular program review as mandated by the Board of Regents and University policy. A self-study document for the department and its programs was developed by the department faculty and completed in the Summer 2017 for undergraduate programs and in Spring, 2019 for graduate programs. These respective reports were provided to the undergraduate reviewers from the Accreditation Board for Engineering and Technology (ABET) before they conducted an on-campus visit on September 17-19, 2017 and provided to two graduate reviewers before they conducted an on-campus visit on April 1-2, 2019. The external reviewers reviewed the program and met with relevant faculty, staff, students and administrators to determine the department's accomplishments, examine strengths and weaknesses, and identify opportunities as it plans for the future. A final report was issued by the site visitors shortly after the review visit. In accordance with institution practice, responses to

the review were solicited from the department and the dean. A final meeting took place on August 22, 2019. This document represents the final MOU of recommendations and findings from the review.

Signatures

Executive Vice President & Provost:	Kevin R. Carman	Date:	09/27/2019
Vice Provost, Undergraduate Education:	David Shintani	Date:	09/27/2019
Vice Provost, Graduate Education & Dean, Graduate School	David Zeh	Date:	09/27/2019
Dean, College of Engineering	Manos Maragakis	Date:	9/30/19
Chair, Computer Science and Engineering	Eelke Folmer	Date:	9/20/19

Major Findings and Conclusions

1. Undergraduate students are provided with a wide variety of opportunities to use knowledge gained in the classroom in real-world problems, particularly with the senior design sequence.
2. Graduate students are satisfied with their educational experience, faculty are engaged and excited about their role and industry partners note that students are of a high quality and have a strong background.
3. The program's growth since 2011 has required an increase in faculty. This has resulted in the addition of high quality faculty members that are in strategic alignment with the program's three focal research areas.
4. Both faculty and Ph.D. students in the program are producing high quality publications in top tier journals, with a significant number of graduates securing tenure-track faculty positions.

Next Steps for this Program/Department

1. Strategic Planning and Building a Vision for the Department:

Reviewers of both the graduate and undergraduate programs recognized the strong connection between the educational experience and real world application for students. It was noted that faculty hires since the last review have been made to strategically support the defined direction of the department and have resulted in an increase in research funding and publications. An update to the strategic plan was recommended to provide broader definitions of research and teaching missions. The department has indicated that work with the college to update the plan has begun and will include effort to move the concept of "growth" beyond numbers to faculty development and enhanced national recognition for the department.

2. Graduate Curriculum & Education

The success of the graduate program in producing graduates that go on to tenure-track positions was recognized as impressive. It was recommended that the department more effectively market this record as a means of recruiting graduate students, which the department is open to pursuing. It was also suggested that marketing language around the term "self-funded fellowship" be reconsidered to ensure an understanding that funding is available through employment. The department is open to this suggestion, but wants to make clear that some students self-fund their participation in the program. The reviewers suggested that the current expectation that Ph.D. students publish two first-authored papers upon graduation is too low of an expectation. Since the time of the review, the department has changed the language to reflect an increased expectation and with clarification given to the publications needing to be in high quality peer-reviewed conference proceedings or journals. A low number of graduate reaching assistantships (GTAs) was cited as an area of possible concern, and it was recommended to increase these numbers to ensure a better student experience via assistantship support. The department recognizes this need, as well as the associated constraints on needed resources to increase the numbers, but is interested in working with the college and administration on increasing GTA lines. It was noted that graduate students can become "stove-piped" in the program, and planning of social activities was encouraged to develop a network among peers. The lack of domestic students in the program was discussed, and it was encouraged that the program works with the Graduate School utilizing programs such as Gradventure to increase those numbers. Finally, annual evaluations of Ph.D. students was recommended to ensure successful progress, which the department is exploring.

3. **Curriculum—Undergraduate**

The undergraduate program was recognized for the strong education offerings that translate into real world application. Graduates of the program were recognized as being well prepared particularly by the senior design sequence, which have produced student-led startup companies and awards for entrepreneurship. The review of the undergraduate program has resulted in several recommendations that have already been resolved by the department. These include updating the defined constituents for Program Educational Objectives (PEOs), ensuring proper mapping between assessments and student outcomes, and requiring advanced engineering topics among the technical electives. Recommendation being addressed include increasing laboratory space and increasing staff size to ensure appropriate course offerings given the increase in enrollment. Lab space will be addressed with the completion of the new College of Engineering building, while the program is working toward increasing faculty numbers.

4. **Space**

As mentioned above, currently space is an issue, but that will be addressed with the completion of the College of Engineering building. Strategic and thoughtful plans for the building are encouraged, as the space will fill up quickly and result in future space challenges.

5. **Faculty**

With the move of the institution to R1 status, it was recommended that consideration be given to moving faculty workloads to a more research focus. This is an iterative process that the department has already taken on, and will continue to make changes that support this effort including the expanded utilization of lecturers. Additionally, it was noted that increases in faculty mentoring for both junior and senior faculty would be beneficial, especially as senior faculty shift to a research focus in alignment with the achieved R1 status.

The department should keep in mind that it is the expectation at the university that tenured faculty in all departments continue to build a portfolio of scholarly work following achievement of tenure so as to move successfully through the promotional ranks to full professor.

Action Items:

- Explore ways to address increasing faculty levels and identify opportunities for collaboration for these faculty both within and outside of the discipline.
- Work with the Graduate School to prioritize funding of CSE TAs as resources become available.
- Review of GTA workloads to ensure consistency across the program regarding time and effort, ensuring that assigned duties are within acceptable levels.
- Explore ways that faculty can assist with keeping students, particularly Ph.D. students, on track for completion. This may be achieved through avenues such as reduction in course requirements, mentoring, and first year reviews.
- Explore options and collaborations to assist/mentor associate professors to move to the full professor rank.
- Comparison will be completed with peer institutions regarding program requirements. Using Curricular Analytics and Navigate (EAB), the college and department will look at degree pressure points (where students are not on track to be successful in the program), identify ways to simplify degree paths and give advising to those students who appear not to be on a successful track. Emphasis on student success should be on both the undergraduate and graduate levels. This is being asked of all program across the University. The goal is to have reports by the end of the fall 2019 semester.

Vital Statistics on NSHE Reports

Bachelor of Science in Computer Science and Engineering

Number of students with declared major in the program area 2018-19:	614
Number of graduates from the program, 2016-17:	71
Number of graduates from the program, 2017-18:	121
Number of graduates from the program, 2018-19:	106
Headcount of students enrolled in any course related to the program (duplicated), Fall 2018:	2766

Masters of Science in Computer Science and Engineering

Number of students with declared major in the program area 2018-19:	52
Number of graduates from the program, 2016-17:	20
Number of graduates from the program, 2017-18:	20
Number of graduates from the program, 2018-19:	22
Headcount of students enrolled in any course related to the program (duplicated), Fall 2018:	58*

Ph.D. in Computer Science

Number of students with declared major in the program area 2018-19:	59
Number of graduates from the program, 2016-17:	6
Number of graduates from the program, 2017-18:	5
Number of graduates from the program, 2018-19:	7
Headcount of students enrolled in any course related to the program (duplicated), Fall 2018:	58*

*Cannot differentiate betweem MS and PhD