

Oregon Institute of Technology

MS Civil Engineering

2017-2018 Assessment Report

- I. The Master of Science of Civil Engineering (MSCE) Program is offered on the Klamath Falls campus in a traditional on-campus instructional mode. The MSCE was approved in 2009 but due to limited instructional faculty staffing, the first students were not admitted to the program until Fall Term 2013. The degree is pursued in one of two modes, as a traditional post-BS degree program mode or in a concurrent degrees (BS/MS) program mode.

During the 2017-18 academic year there were eleven students enrolled in the MSCE program. Two in the post-BS degree mode, five students continuing their BS/MS studies beyond the traditional five years, and four in the (nominal) 5th year of the concurrent degrees (BS/MS) mode. In Fall 2017, one of these students earned concurrent BS/MS degrees, followed by another BS/MS graduate in Winter term 2018. In Spring 2018, two more students graduated with BS/MS degrees. One post-BS student continued working on a graduate project while a second post-BS student started classes while working full-time with the intention to graduate in four years. All remaining concurrent BS/MS students continued on with their graduate studies, having completed coursework and concentrating on graduate project reports.

Beyond the 2017-18 year the concurrent degrees (BS/MS) program remains popular with an additional two students declaring intent to begin their fifth year of MSCE studies in 2018-19.

Traditional retention rates are difficult to compute for such a new and small program, however of the four students in the fifth year of the concurrent BS/MS program as of Fall 2017, two have now graduated. These graduates are finding success with a variety of employers. One is working for a consulting engineering firm, while another is working for a county public works department. Each 2017-18 MSCE graduate had successfully completed the fundamentals of engineering (FE) exam prior to graduation.

- II. Since the primary mode is the concurrent degrees (BS/MS), the mission and objectives of the BS program are integrated within the BS/MS and are as listed below.

The mission of program is to prepare students for professional practice. To be prepared to practice as professionals, engineers must be able to act responsibly and ethically, understand their limits and the limits of the tools they use, communicate effectively, work well in teams, and, amid the changing landscape of the field of civil engineering, be able to pursue graduate level education either as a BS/MS student at Oregon Tech or at another university.

The following objectives are what the faculty expects graduates from the program to be able to accomplish a few years after the commencement of their careers and stem directly from the program mission. The alumni from the program should be able to:

- practice in civil engineering or a related field.
- pursue advanced education in civil engineering or a related field.
- act as responsible, effective, and ethical citizens.
- communicate effectively.
- collaborate effectively.

There are two student learning outcomes (SLO) in the MSCE program.

1. Ability to conduct scholarly research commensurate with the graduate level.
2. Attainment of advanced technical knowledge in one or more civil engineering specialty area (geotechnical, structural, transportation, water resources).

The Civil Engineering Industrial Advisory Committee (CE-IAC) provides advice on both the BS and MS degrees. The CE-IAC meets annually to discuss the MSCE program with both faculty and students. The most recent meeting took place Friday May 4, 2018. Each of the fourth year BS/MS students in their first term of study discussed their coursework and projects with the IAC members and received valuable input including technical leads and references for their graduate work.

- III. Due to the small size of the program and the small number of SLOs, each of the two SLOs listed in Part II will be assessed for each student in each year of the three-year assessment cycle. As the program grows in size and/or there are additional SLOs, this concept may be modified.
- IV. All four MSCE graduates in 2017-18 prepared a graduate project report prepared to standards set by Oregon Tech's Graduate Council. These graduate project reports were prepared over a period of six to nine months under the supervision of a CE Dept. faculty member and also reviewed by a Communication Dept. faculty member. Each student in the MSCE program is required to complete a 3-credit communications course, WRI 521 Writing at the Graduate Level, as a means to provide each student with writing instruction specifically aimed at developing scholarly writing techniques. Each graduate project was also reviewed by a CE faculty advisor and the CE Department Chair

Thus SLO #1 Ability to conduct scholarly research commensurate with the graduate level was ensured by requiring three levels of review and approval (CE faculty advisor, COM faculty reviewer, CE dept. chair) of each graduate project report.

Copies of each completed graduate report are archived in electronic form in the Oregon Tech library and paper copies are stored in the assessment filing cabinet in the Civil Engineering Department Chair's office.

To ensure of SLO #2 Attainment of advanced technical knowledge in one or more civil engineering specialty area (geotechnical, structural, transportation, water resources), each MSCE graduate in 2017-18, in addition to WRI 521 Writing at the Graduate Level and CE 501 Graduate Seminar, successfully completed at least 41 graduate level technical elective credits in one or more CE specialty areas. A list of available courses is listed in VIII.

While the relatively small sample size makes it difficult to draw any meaningful recommendations for improvements to the program, the faculty continued to observe that project-based students needed several rounds of revisions to create acceptable graduate project reports. This was not unexpected given our experiences in past years and therefore once again this year students were advised to start report preparation early in the calendar year. These cycles of revisions can be time consuming, yet are essential to the creation of acceptable work. Even with this additional advising from faculty, some students were making revisions during the final week of Spring Term. The department plans to meet in Fall 2018 to discuss the perennial problem of students leaving campus before completing MS graduate project reports.

VIII. Appendices

MSCE Students choose their 41 credits of graduate-level technical electives from the following list (no more than 9 credits may be at the 400-level). Students choosing the project-based route take between 3 and 9 credits of CE 590 CE Graduate Project:

CE411	Engineering Geology	Sleep	3-0-3
CE413	Advanced Soils Lab	Sleep	2-3-3
CE421/511	Seepage and Earth Structures	Sleep	3-0-3
CE422/522	Advanced Shear Strength	Sleep	3-0-3
CE423/513	Deep Foundations	Sleep	3-0-3
CE432	Structural Loading and Lateral Forces	StClair	4-0-4
CE433/533	Matrix Structural Analysis	StClair	2-3-3
CE439/539	Bridge Rating	Riley	2-3-3
CE442	Advanced Reinforced Concrete Design	StClair	4-0-4
CE444	Intermediate Steel Design	Riley	4-0-4
CE447	Masonry Design	StClair	3-0-3
CE448	Timber Design	StClair	3-0-3
CE449/549	Bridge Design	Riley	3-3-4
CE450/550	Transportation Structures	Riley	2-3-3
CE456	Pavement Engineering	Lindgren	2-3-3
CE457/557	Transportation & Land Development	Lindgren	2-3-3
CE458/558	Transportation Safety	Lindgren	4-0-4
CE468/568	Travel Demand Modeling	Lindgren	3-3-4
CE472/572	Hydrometry	Thaemert	2-3-3
CE473	Groundwater	Thaemert	3-0-3
CE476/576	Applied Hydraulic Design	Thaemert	2-3-3
CE481	Environmental Engineering 1	Thaemert	3-3-4
CE489	Treatment Wetlands	Thaemert	3-0-3
CE501	Graduate Seminar	Lindgren	1-0-1
CE512	Earthquake Engineering	Sleep	3-0-3
CE534	Advanced Solid Mechanics	Riley	3-0-3
CE535	Structural Dynamics	Riley	2-3-3
CE542	Prestressed Concrete Design	StClair	3-0-3
CE544	Advanced Steel Design	Riley	3-0-3
CE551	Geometric Design	Lindgren	2-3-3
CE554	Advanced Traffic Engineering	Lindgren	2-3-3
CE556	Advanced Pavement Design	Lindgren	2-3-3
CE571	Open-Channel Hydraulics	Thaemert	3-3-4
CE574	Environmental River Mechanics	Thaemert	3-3-4
CE586	Water & Wastewater Treatment	Thaemert	4-0-4
CE587	Environmental Remediation Technologies	Thaemert	3-0-3