

2018 Annual Assessment Report and Action Plan

Construction Engineering Management Program

Follow-up from 2017 Annual Assessment Report and Action Plan:

1. Pursue changing H385 Safety and Health Standards and Laws, which is a required course for CEM students taught in another School, to a CEM course taught by a CEM faculty member. This change would allow the course to be more construction-focused and would allow students to “Create a construction safety plan,” which is one of the Focus Areas identified in this year’s Annual Assessment Report. Additionally, students completing the CEM safety course would receive their OSHA 30 cards, since the planned instructor is an OSHA Authorized Construction Outreach Trainer. The IAB was supportive of this initiative as a way of improving coverage of construction safety, which is of paramount importance to the industry. **Follow-up: The CEM curriculum has been changed such that students must take either H 385 or CEM 326, the new OSHA 30 construction safety course, to fulfill graduation requirements. It is anticipated that some students will take both courses, with CEM 326 counting as their upper-division technical elective.**
2. Encourage CEM students to take the graduate-level “Design for Safety,” “Project Controls,” or “Lean Construction” courses to fulfill their technical elective requirement. Taking one of these three courses would likely help to improve some of the SLO’s identified as Weaknesses. **Follow-up: Students continue to be able to take these graduate-level courses, though a measurable improvement in achievement is not yet present.**
3. The CEM Faculty supports the CCE plan to incrementally increase the CEM Pro-School GPA requirement to the same level as the CE GPA. **Follow-up: Pro-School is being eliminated at the College level, making the GPA requirement irrelevant. No further action.**

Survey Data Results

Results of surveys from 24 alumni from the class of 2016, 8 alumni from the class of 2013, and 105 employers were reviewed by CEM faculty and the CCE Industry Advisory Board during Fall 2018. The surveys of graduating seniors were conducted by the OSU College of Engineering for Winter, Spring, and Summer 2018 graduates. Data for the “customer satisfaction” questions for 2018 Graduates was not collected. The surveys of alumni and employers were conducted by the School of CCE in June and July of 2018 using the Qualtrics platform.

1. Overall customer satisfaction:

Survey Item	Alumni 2016	Alumni 2013
# reporting CEM Program “moderately” or “extremely” fulfilled their expectations / satisfied with educational preparation	20 of 24	6 of 8
# who would “probably” or “definitely” recommend CEM to others	23 of 24	8 of 8

Employer Survey:

- 94 of 105 employers indicated they were “moderately” satisfied or “very” satisfied with OSU CEM graduates educational preparation. Average score was 6.0 out of 7.0.
- 89 of 104 respondents rated the professionalism, in terms of attitude and work ethic, of OSU CEM graduates to be “moderately” or “extremely” professional, with an average score of 6.2 out of 7.0.
- 103 of 105 respondents indicated they would “probably” or “definitely” hire another OSU CEM graduate, for an average score of 6.8 out of 7.0.

2. Achievement of CEM Program Student Learning Outcomes (SLO’s):

- a. Alumni 2016: Average scores for “quality of preparation” for 12 out of 20 Student Learning Outcomes met or exceeded the target minimum of 4.9 out of 7.0, with 19 out of 20 scoring 4.5 or greater.
- b. Alumni 2013: Average scores for “quality of preparation” for 9 out of 20 Student Learning Outcomes met or exceeded the target minimum of 4.9 out of 7.0, with 17 out of 20 scoring 4.5 or greater.

- c. Employers: Only 5 out of 20 SLO's achieved the target score of 4.9 or greater for "quality of preparation," though all of the remaining 14 SLO's scored no lower than 4.2.

3. High Priority SLO's:

The following SLO's were rated by three surveyed groups as being below the target minimum score of 4.9 for "quality of preparation." While these scores are generally only slightly below the target, they may be considered as high priority for improvement.

- SLO 3 "Create a construction project safety plan."
- SLO 11 "Apply basic surveying techniques for construction layout of control."
- SLO 15 "Understand construction quality assurance and control."
- SLO 16 "Understand construction project control processes."
- SLO 17 "Understand the legal implications of contract, common, and regulatory law to manage a construction project."

Analysis of the "Importance minus Gap" metric for each SLO was conducted to identify the top few SLO's which most combine a high importance with a large gap in student preparation. The following SLO's ranked among the highest "Importance minus Gap" values for more than one of the surveyed groups. It is worth noting that the exact same three SLO's appear on this list in the 2016 and 2017 Annual Assessments.

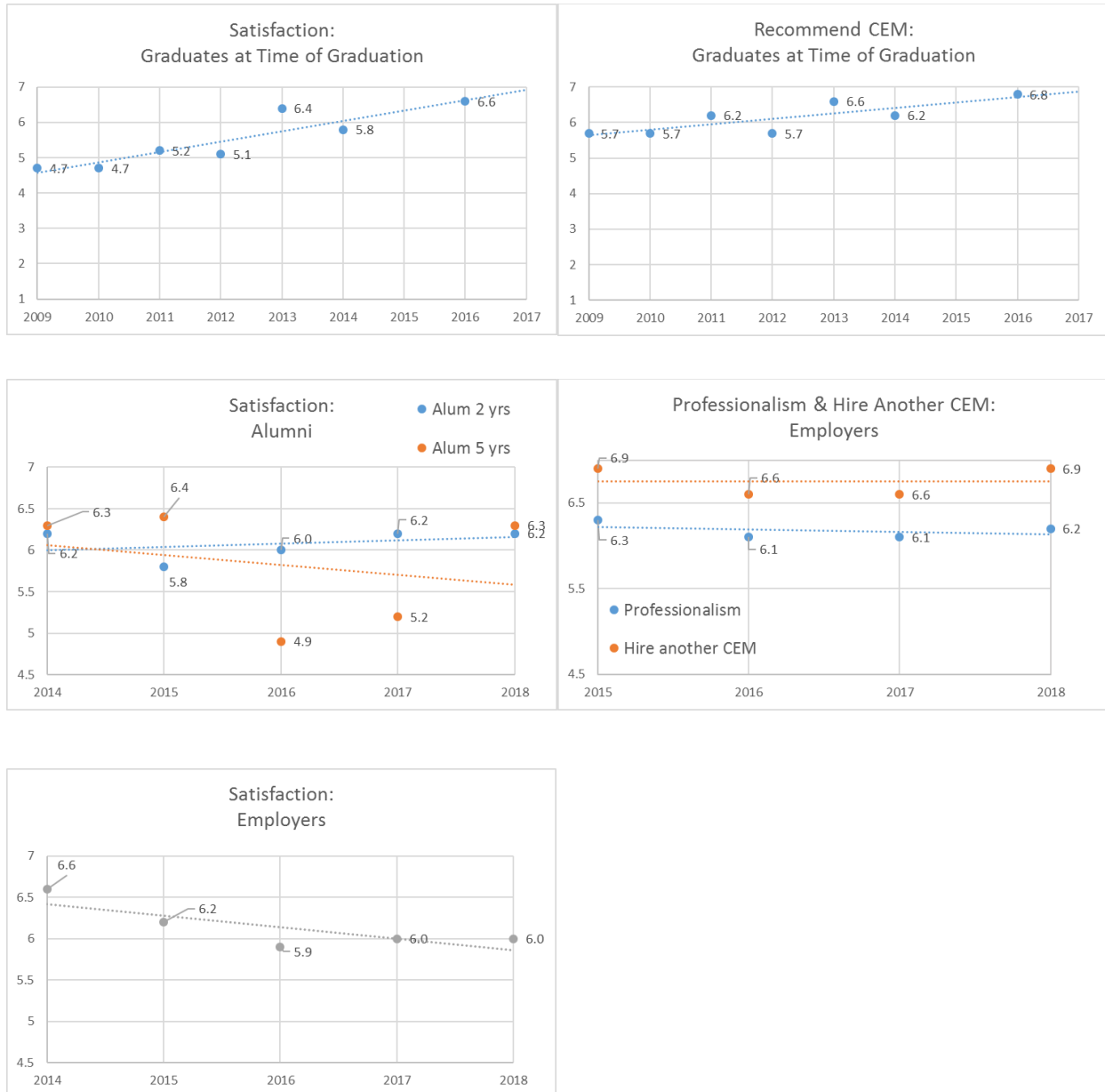
- SLO 4 "Create construction project cost estimates."
- SLO 7 "Analyze construction documents for planning and management of construction processes."
- SLO 14 "Understand construction accounting and cost control."

Direct Assessment of SLO's by Faculty

None of the SLO's directly assessed by individual faculty members during the past year was identified as deficient (*i.e.*, less than 70% of students passing the assessment).

Trends

Historical data from survey questions regarding Satisfaction, Professionalism, Hiring of other CEM graduates, and Recommending the CEM major were analyzed to determine if any trends are present. A slight upward trend in Graduating Seniors' "Satisfaction" may be seen. Slight downward or flat trends from Alumni and Employers can be identified, though the number of years assessed may be too small to draw meaningful conclusions. No Action Items were identified based on this data.



Focus Areas

The CEM faculty analyzes survey data and trends, SLO direct assessment results, and input from faculty, staff, students, industry, and administration to identify Focus Areas for improvement for the upcoming year.

For the survey data, priority is given to SLO's which meet the following criteria:

- high "Importance minus Gap" factor
- low "Quality of preparation" scores on surveyed group results
- high "Importance" factor on multiple surveyed group results
- having one or more of the three above criteria for multiple years consecutively

The following items are identified as Focus Areas for this year.

- 1) Use of technology in the students' educational experience.
- 2) Project-based learning to improve reading construction drawings and other documents (related to SLO 7), possibly throughout a series of courses.
- 3) Evaluation of CEM curriculum in light of the elimination of the Pro-School system, with emphasis on enhancing innovation, project-based learning, leadership, and critical analysis and thinking.

Summary and Action Plan: (After Discussion with CEM Faculty on October 24, 2018 and with IAB on October 19, 2018)

1. One faculty member will evaluate the use of an interactive classroom technology (Top Hat) and share findings with the faculty. Expanded use of such technologies will be considered at that time.
2. Re-assess the entire CEM curriculum in terms of sequencing and flow of courses as well as inclusion, exclusion, or modification of courses, in light of the elimination of the Pro-School system. Focus areas for curriculum improvement will include innovation, project-based learning, leadership, and critical analysis and thinking.

Appendix A: Summary of 4 Surveys from 2018

Scale of 1 – 7 with a target minimum score of 4.9 for first four questions and for SLO “Preparation.”

	Alumni 2016				Alumni 2013				Employers			
Satisfaction	6.1				6.3				6.0			
Professionalism (attitude & work ethic)	-				-				6.2			
Hire another CEM?	-				-				6.8			
Recommend CEM?	6.6				6.6				-			
Number of respondents	n=24				n=8				n=104			
20 Student Learning Outcomes (SLO's)	Importance	Preparation	Gap = Prep-Imp	Import - Gap	Importance	Preparation	Gap = Prep-Imp	Import - Gap	Importance	Preparation	Gap = Prep-Imp	Import - Gap
1. Create written communications appropriate to the construction discipline.	5.8	5.3	(0.5)	6.3	5.5	5.3	(0.3)	5.8	6.0	5.1	(0.9)	6.9
2. Create oral presentations appropriate to the construction discipline.	4.5	4.9	0.4	4.1	4.5	5.3	0.8	3.8	5.2	4.8	(0.4)	5.6
3. Create a construction project safety plan.	5.1	4.2	(0.9)	6.0	4.3	3.4	(0.9)	5.1	5.2	4.4	(0.8)	6.0
4. Create construction project cost estimates.	6.1	5.2	(0.9)	7.0	6.0	4.3	(1.8)	7.8	6.0	4.7	(1.3)	7.4
5. Create construction project schedules.	5.7	4.9	(0.8)	6.5	4.8	4.1	(0.6)	5.4	5.8	4.8	(1.0)	6.9
6. Analyze professional decisions based on ethical principles.	5.9	5.4	(0.5)	6.4	5.4	5.8	0.4	5.0	6.3	5.5	(0.8)	7.0
7. Analyze construction documents for planning and management of construction processes.	6.7	5.4	(1.3)	7.9	6.3	5.3	(1.0)	7.3	6.3	5.1	(1.2)	7.4
8. Analyze methods, materials, and equipment used to construct projects.	6.2	5.2	(1.0)	7.1	5.9	4.1	(1.8)	7.6	5.7	4.8	(0.9)	6.6
9. Apply construction management skills as an effective member of a multi-disciplinary team.	6.4	5.4	(1.0)	7.4	5.9	5.3	(0.6)	6.5	6.0	5.2	(0.8)	6.9
10. Apply electronic-based technology to manage the construction process.	5.8	5.4	(0.4)	6.1	5.4	4.9	(0.5)	5.9	5.8	5.7	(0.1)	5.9
11. Apply basic surveying techniques for construction layout of control.	3.6	4.8	1.2	2.4	2.0	4.5	2.5	(0.5)	3.9	4.6	0.6	3.3
12. Understand different methods of project delivery and the roles and responsibilities of all constituencies involved in the design and construction process.	5.5	5.2	(0.3)	5.8	4.6	4.8	0.1	4.5	5.1	4.5	(0.5)	5.6
13. Understand construction risk management.	5.8	4.7	(1.1)	7.0	5.4	5.0	(0.4)	5.8	5.7	4.5	(1.2)	6.9
14. Understand construction accounting and cost control.	6.0	4.7	(1.3)	7.3	5.8	5.0	(0.8)	6.5	6.0	4.6	(1.3)	7.3
15. Understand construction quality assurance and control.	6.1	4.5	(1.5)	7.6	4.8	4.3	(0.5)	5.3	5.7	4.8	(0.9)	6.6
16. Understand construction project control processes.	5.5	4.8	(0.6)	6.1	5.5	4.5	(1.0)	6.5	5.5	4.8	(0.8)	6.3
17. Understand the legal implications of contract, common, and regulatory law to manage a construction project.	5.8	4.6	(1.3)	7.1	6.0	4.8	(1.3)	7.3	5.4	4.3	(1.1)	6.5
18. Understand the basic principles of sustainable construction.	4.1	4.5	0.4	3.7	3.4	5.6	2.3	1.1	4.3	4.5	0.3	4.0
19. Understand the basic principles of structural behavior.	4.5	5.5	1.0	3.5	4.1	4.8	0.6	3.5	4.5	4.7	0.3	4.2
20. Understand the basic principles of mechanical, electrical, and plumbing systems.	5.2	5.4	0.2	5.0	4.5	5.9	1.4	3.1	4.6	4.2	(0.4)	5.0