

University of Washington
Department of Construction Management
Academic Quality Improvement Plan Report for AY 2018/19
Bachelor of Science in Construction Management Program

This report highlights the findings of the AY 2018/19 assessment cycle. It serves as the basis for the faculty and the Construction Industry Advisory Council (CIAC) review during the fall of 2019. Recommendations and any plans for updates will be documented in an “Appendix C: After review report”.

1. Strategic Plan for the Educational Unit

The strategic plan for the University of Washington’s Construction Management department is found in a separate document titled “CM Strategic Plan 2015-2017” dated 8 October 2015.

This plan was reviewed by the faculty and staff in the fall of 2015 and updated in the fall of 2015. A brief version of our Mission, Vision, and Objectives can be found at:

http://cm.be.washington.edu/about_cm/mission/

2. Degree Program Assessment Plan

A comprehensive assessment plan provides complete continuous improvement of our undergraduate degree program. AY 2015/6 was the first year of implementation of this plan. The plan was modified in the fall of 2016.

2.1 Undergraduate Program Mission Statement

The construction management program prepares individuals for careers in the construction and related industries by providing a high quality education.

2.2 Degree Program Objectives

The following objectives are part of the strategic plan that relates to the undergraduate program and will be reviewed annually. The framework of these objectives are to provide accessible, challenging, quality, and contemporary educational program that prepares individuals to assume technical and managerial positions in the construction and related industries. Specific objective measurements with results are:

- Number of students admitted each year, between 60-70: Fall **2019: 68**
- Number of transfer students admitted each year, > 25%: **2019: 12%**
- Placement rate of graduates, > 95%, **97%**
- Accreditation by American Council for Construction Education (ACCE): **ACCE visit March 2019, outcome of July meeting?**
- Provide experiential learning opportunities for students.
 - Number of students with internships, 100%, **100%**

A historical representation of this data is found in Appendix A. This data will be reviewed for trends.

2.3. Program Learning Outcomes

The program learning outcomes meet and exceed the student learning outcomes required by ACCE. In addition to the program objectives listed above, the Student Learning Outcomes (SLOs) will be assessed, reviewed, and results acted on annually. Student work was assessed against the standard of the program's performance criteria. Individual assessment tools for specific SLOs are found in their respective notebooks.

The program's performance assessment is limited to the 20 SLOs that are being assessed by one direct measure and one indirect measure. Our plan is to directly assess SLO at different times during a student's tenure. We will also indirectly assess all SLOs as part of the senior exit survey.

2.4 Assessment tools and frequency of use for Student Learning Outcomes (2018/19)

The following table provides a guide for which class has Student Learning Outcomes assessed. Each student learning outcome is assessed at least twice and at least one of these assessments is a direct assessment. DA = Direct Assessment, IA = Indirect Assessment

		1 WRITE	2 ORAL	3 SAFE	4 EST	5 SCH	6 ETHIC	7 DOCS	8 METHOD	9 MULIT TEAM	10 TECH	11 SURVEY	12 DELIVERY	13 RISK	14 ACCT	15 QC	16 CONTROL	17 LAW	18 SUSTAIN	19 STRUCT	20 MEP
CM 301	Write	DA																			
CM 310	Intro												DA								
CM 311	Docs																				
CM 312	Acct														DA						
CM 313	Meth									DA											
CM 321	Mech																				DA
CM 322	Elect																				DA
CM 323	Meth 2																				
CM 332	Equip								DA												
CM 331	Est 1				DA			DA													
CM 333	Safe			DA																	
CM 334	Survey											DA									
CM 335	Sustain																			DA	
CM 410	Est 2				DA																
CM 411	Sched					DA											DA				
CM 412	Practice						DA							DA							
CM 414	BIM										DA										
CM 420	Temp Str																				DA
CM 421	PM															DA					
CM 417	R PM																				
CM 422	Comp App										DA										
CM 423	Law																				DA
CM 431	Capstone		DA	DA		DA															
CM 434	Lean																DA				
Exit Survey		IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA

Student Learning Outcomes

1. Create written communications appropriate to the construction discipline.
2. Create oral presentations appropriate to the construction discipline.
3. Create a construction project safety plan.
4. Create construction project cost estimates.
5. Create construction project schedules.
6. Analyze professional decisions based on ethical principles.
7. Analyze construction documents for planning and management of construction processes.
8. Analyze methods, materials, and equipment used to construct projects.
9. Apply construction management skills as a member of a multidisciplinary team.
10. Apply electronic-based technology to manage the construction process.
11. Apply basic surveying techniques for construction layout and control.
12. Understand different methods of project delivery and the roles and responsibilities of all constituencies involved in the design and construction process.
13. Understand construction risk management.
14. Understand construction accounting and cost control.
15. Understand construction quality assurance and control.
16. Understand construction project control processes.
17. Understand the legal implications of contract, common, and regulatory law to manage a construction project.
18. Understand the basic principles of sustainable construction.
19. Understand the basic principles of structural behavior.
20. Understand the basic principles of mechanical, electrical and piping systems.

2. 5. Assessment performance criteria results for Student Learning Outcomes

The following tables list the specifics of the assessment tools used, the performance criteria results used to measure the achievement of a student learning outcome, and the current results. A historical representation of this data is found in Appendix B. This data will be reviewed for trends.

1. Create Written Communication appropriate to the construction discipline

Where assessed/Who	Assessment item	Performance Criteria	AY 15/16	AY 16/17	AY 17/18	AY 18/19
CM 301 Construction Communications/ Instructor	Business letter assignment	100% of the students will earn greater than 80%	A Missing W Missing S 46%	A 63% W 86% S 68%	A 70% W not offered S84%	A 89% S 90%
Exit Survey/ Academic Advisor	Question on how well students feel they can accomplish SLO	Greater than 3.5 on scale of 1 to 5	4.0	4.0	4.1	3.9

2. Create oral presentations appropriate to the construction discipline

Where assessed/ Who	Assessment item	Performance Criteria	AY 15/16	AY 16/17	AY 17/18	AY 18/19
CM 431 Capstone/ Juror	Presentation to juror	100% of the students earn greater 40 out of 60 points	A 100% B 100% C 100%	A 100% B 100% C not offered	A 100% B 94% C 95%	A B 88% C
Exit Survey/ Academic Advisor	Question on how well students feel they can accomplish SLO	Greater than 3.5 on scale of 1 to 5	4.0	3.5	4.0	3.9

3. Create a construction project safety plan

Where assessed/ Who	Assessment item	Performance Criteria	AY 15/16	AY 16/17	AY 17/18	AY 18/19
CM 333 Safety/ Instructor	Safety plan for class project	At least 85% of students earn at least 85%	100%	82%	57%	A 82% B 89%
CM 431 Capstone/ Instructor	Site specific hazard analysis plan	80% of students score greater 80%	A 100% B 87% C 85%	A 100% B 91% C not offered	A 100% B 92% C 52%	A B 91% C
Exit Survey/ Academic Advisor	Question on how well students feel they can accomplish SLO	Greater than 3.5 on scale of 1 to 5	3.7	4.0	3.9	3.6

4. Create construction project cost estimates.

Where assessed/ Who	Assessment item	Performance Criteria	AY 15/16	AY 16/17	AY 17/18	AY 18/19
CM 331 Construction Estimating/ Instructor	Concrete MTO as homework assignment	100% of students earn at least 80%	A 89% B 86% C 95%	A 85% B 95% C 85%	A 97% B 93% C 97%	A B 78% C 89%
CM 410 Construction Estimating II/ Instructor	Self-perform/ GCs/ GMP estimate as homework assignment	100% of students earn at least 80%	A 92 % B 96%	A 97% B 96%	A 94% B 91%	A 70% B 85%
Exit Survey/ Academic Advisor	Question on how well students feel they can accomplish SLO	Greater than 3.5 on scale of 1 to 5	4.0	3.9	4.0	3.8

5. Create construction project schedules

Where assessed/ Who	Assessment item	Performance Criteria	AY 15/16	AY 16/17	AY 17/18	AY 18/19
CM 411 Project Planning and Control/ Instructor	Final exam question to develop WBS and an activity network	80% of students earn at least 80%	A 85% B 89%	A 81% B 91%	A 88% B 81%	A 82% B 83%
CM 431 Capstone/ Instructor	Create schedule of construction project with over 100 activities	80% of students earn at least 80%	A 80% B 85% C 83%	A 88% B 88% C not offered	A 100% B 85% C 83%	A B 91% C
Exit Survey/ Academic Advisor	Question on how well students feel they can accomplish SLO	Greater than 3.5 on scale of 1 to 5	3.7	3.6	3.6	3.1

6. Analyze professional decisions based on ethical principles

Where assessed/Who	Assessment item	Performance Criteria	AY 15/16	AY 16/17	AY 17/18	AY 18/19
CM 412/ Instructor	Ethics paper	85% of the students earn at least an 80%	60%	72%	96%	98%
Exit Survey/ Academic Advisor	Question on how well students feel they can accomplish SLO	Greater than 3.5 on scale of 1 to 5	3.9	4.1	3.9	4.0

7. Analyze construction documents for planning and management of construction processes

Where assessed/Who	Assessment item	Performance Criteria	AY 15/16	AY 16/17	AY 17/18	AY 18/19
CM 311 Construction Contract Documents/ Instructor	Series of questions on final exam	80% of students earn at least 80%	A 70% B 80%	A 59% B 64% C 81%	A 76% B 72% C 76%	NA changed to CM 331
Exit Survey/ Academic Advisor	Question on how well students feel they can accomplish SLO	Greater than 3.5 on scale of 1 to 5	4.1	4.0	4.0	3.8

8. Analyze methods, materials, and equipment used to construct projects.

Where assessed/Who	Assessment item	Performance Criteria	AY 15/16	AY 16/17	AY 17/18	AY 18/19
CM 332 Construction Equipment Management/ Instructor	Series of calculation on a midterm exam to find the quantities, cycle times and number of trips	80% of students earn greater than 80%	93%	99%	58%	
Exit Survey/ Academic Advisor	Question on how well students feel they can accomplish SLO	Greater than 3.5 on scale of 1 to 5	3.6	3.6	3.7	3.4

9. Apply construction management skills as a member of a multidisciplinary team

Where assessed/Who	Assessment item	Performance Criteria	AY 15/16	AY 16/17	AY 17/18	AY 18/19
CM 313 Construction Methods and Materials/ Instructor	Methods and Materials lab to layout and construct steel structure	100% of the students earn 100% on laboratory assignment	Missing	98%	97%	
Exit Survey/ Academic Advisor	Question on how well students feel they can accomplish SLO	Greater than 3.5 on scale of 1 to 5	3.9	3.9	3.9	3.8

10. Apply electronic-based technology to manage the construction process

Where assessed/Who	Assessment item	Performance Criteria	AY 15/16	AY 16/17	AY 17/18	AY 18/19
CM 414 Virtual Construction	Create model in BIM	80% of the students earn at least 80%	established for AY 16/17	69%	83%	70%
CM 422 Computer Applications in Construction/ instructor	Create a schedule using software	80% of students earn at least 80%	89%	89%	88%	
Exit Survey/ Academic Advisor	Question on how well students feel they can accomplish SLO	Greater than 3.5 on scale of 1 to 5	4.0	3.7	3.9	3.8

11. Apply basic surveying techniques for construction layout and control.

Where assessed/Who	Assessment item	Performance Criteria	AY 15/16	AY 16/17	AY 17/18	AY 18/19
CM 334 Construction Surveying/ Instructor	Students complete a level loop	90% of students are able to score at least a 90%	SLO not developed	SLO not developed	93%	
Exit Survey/ Academic Advisor	Question on how well students feel they can accomplish SLO	Greater than 3.5 on scale of 1 to 5	3.3	2.9	3.1	3.1

12. Understand different methods of project delivery and the roles and responsibilities of all constituencies involved in the design and construction process

Where assessed/ Who	Assessment item	Performance Criteria	AY 15/16	AY 16/17	AY 17/18	AY 18/19
CM 310 Introduction to the Construction Industry/ Instructor	Student interview papers and exam questions	80% of students score > 80%	98%	94%	72%	
Exit Survey/ Academic Advisor	Question on how well students feel they can accomplish SLO	Greater than 3.5 on scale of 1 to 5	4.2	4.1	4.0	3.8

13. Understand construction risk management.

Where assessed/Who	Assessment item	Performance Criteria	AY 15/16	AY 16/17	AY 17/18	AY 18/19
CM 412 Construction practice/ Instructor	Risk analysis of construction project	85% of the student earn at least 85%	100%	95%	93%	93%
Exit Survey/ Academic Advisor	Question on how well students feel they can accomplish SLO	Greater than 3.5 on scale of 1 to 5	3.9	3.7	3.7	3.9

14. Understand construction accounting and cost control

Where assessed/Who	Assessment item	Performance Criteria	AY 15/16	AY 16/17	AY 17/18	AY 18/19
CM 312 Construction Accounting/ Instructor	Answer a series of 10 questions on a final exam	90% of the students earn greater than 90%	A 55% B 31%	A 90% B 40%	A 34% combined sections	
Exit Survey/ Academic Advisor	Question on how well students feel they can accomplish SLO	Greater than 3.5 on scale of 1 to 5	3.5	3.6	3.6	3.4

15. Understand construction quality assurance and control

Where assessed/Who	Assessment item	Performance Criteria	AY 15/16	AY 16/17	AY 17/18	AY 18/19
CM 421 Project Management/ Instructor	Series of final exam questions that differential between active and passive QC	80% of students earn at least 80%	A 100% B 78% C 40%	A 100% B 98% C 81%	A 96% B 88% C 40%	
Exit Survey/ Academic Advisor	Question on how well students feel they can accomplish SLO	Greater than 3.5 on scale of 1 to 5	3.7	3.6	3.8	3.6

16. Understand construction project control processes

Where assessed/Who	Assessment item	Performance Criteria	AY 15/16	AY 16/17	AY 17/18	AY 18/19
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CM 434 Lean Project Management/ Instructor	Series of five questions on final exam	80% of students earn at least 80%	Class not offered yet	82%	80%	
CM 411 Construction Planning and Control/ Instructor	80% of students earn at least 80%	80% of students earn at least 80%	89%	86%	81%	80%
Exit Survey/ Academic Advisor	Question on how well students feel they can accomplish SLO	Greater than 3.5 on scale of 1 to 5	3.6	3.5	3.6	3.6

17. Understand the legal implications of contract, common, and regulatory law to manage a construction project

Where assessed/Who	Assessment item	Performance Criteria	AY 15/16	AY 16/17	AY 17/18	AY 18/19
CM 423 Construction law/ Instructor	Students answer case study questions on midterm	100% of students > 80%	SLO tool not developed	95%	77%	
Exit Survey/ Academic Advisor	Question on how well students feel they can accomplish SLO	Greater than 3.5 on scale of 1 to 5	3.6	3.7	3.7	3.7

18. Understand the basic principles of sustainable construction

Where assessed/Who	Assessment item	Performance Criteria	AY 15/16	AY 16/17	AY 17/18	AY 18/19
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CM 335 Sustainable Construction/ Instructor	LEED Green Associate Exam	At least 90% of students pass exam	98%	100%	89%	96%
Exit Survey/ Academic Advisor	Question on how well students feel they can accomplish SLO	Greater than 3.5 on scale of 1 to 5	3.6	3.9	3.6	3.7

19. Understand the basic principles of structural behavior

Where assessed/Who	Assessment item	Performance Criteria	AY 15/16	AY 16/17	AY 17/18	AY 18/19
CM 420 Temporary Structures/ Instructor	Series of questions on midterm exam	100% of students earn 70%	SLO not developed	SLO not developed	84%	
Exit Survey/ Academic Advisor	Question on how well students feel they can accomplish SLO	Greater than 3.5 on scale of 1 to 5	3.8	3.8	3.6	3.5

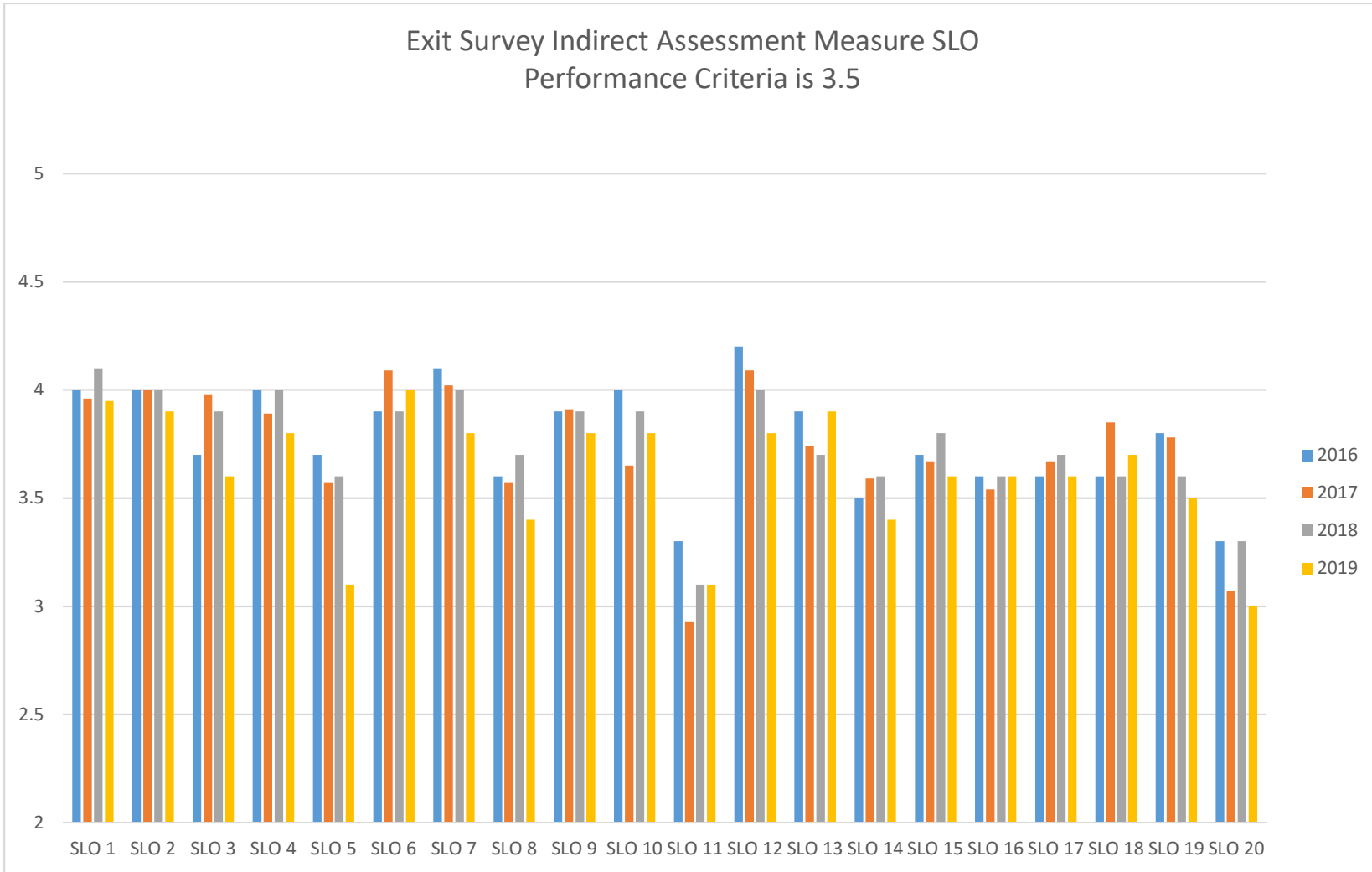
20. Understand the basic principles of mechanical, electrical and piping systems

Where assessed/Who	Assessment item	Performance Criteria	AY 15/16	AY 16/17	AY 17/18	AY 18/19
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CM 321 Mechanical Systems in Buildings/ Instructor	Describe characteristics of a mechanical system	80% of students > 90%	Missing data	92 %	94%	
CM 322 Electrical Systems in Buildings/ Instructor	Response to RFP assignment	80% of students earn at least 90%	Missing data	91%	84%	
Exit Survey/ Academic Advisor	Question on how well students feel they can accomplish SLO	Greater than 3.5 on scale of 1 to 5	3.3	3.1	3.3	3.0

Exit Survey results for AY 2016 to 2019

Class of 2016-2019 Exit Survey with Previous Years



- SLO 1: I am able to create oral presentations appropriate to the construction discipline.
- SLO 2: I am able to create written communications appropriate to the construction discipline.
- SLO 3: I am able to create a construction project safety plan.
- SLO 4: I am able to create construction project cost estimates.
- SLO 5: I am able to create construction project schedules.
- SLO 6: I am able to analyze professional decisions based on ethical principles.
- SLO 7: I am able to analyze construction documents for planning and management of construction processes.
- SLO 8: I am able to analyze methods, materials, and equipment used to construct projects.
- SLO 9: I am able to apply construction management skills as a member of a multidisciplinary team.
- SLO 10: I am able to apply electronic-based technology to manage the construction process.
- SLO 11: I am able to apply basic surveying techniques for construction layout and control.
- SLO 12: I understand different methods of project delivery and the roles and responsibilities of all constituencies involved in the design and construction process.
- SLO 13: I understand construction risk management.
- SLO 14: I understand construction accounting and cost control.
- SLO 15: I understand construction quality assurance and control.
- SLO 16: I understand construction project control processes.
- SLO 17: I understand the legal implications of contract, common, and regulatory law to manage a construction project.
- SLO 18: I understand the basic principles of sustainable construction.
- SLO 19: I understand the basic principles of structural behavior.
- SLO 20: I understand the basic principles of mechanical, electrical and piping systems.

3. Assessment Implementation Plan

Assessment evaluation data was due to the department chair by the 15th of each month after a quarter ends, except for spring when it is due on 15 June. The senior exit survey was conducted as part of the CM 412 Construction Practices class and results were made available by 15 June 2019. The department chair collated the program assessment data and degree program objectives data for review at both an autumn faculty meeting and the Construction Industry Advisory Council (CIAC) meeting. Recommendations, improvements, corrective actions, and changes will be recorded and reflected in future appendix (C) to this document.

4. Chairs findings and recommendations:

AY 2017/19 was our fourth year of collecting data since significant changes to our assessment plan were made.

ACCE visiting team was in March 2019.

- Are we following ACCE guidelines?

For the most part, yes, however we had one weakness

Two SLOs were not properly being assessed

SLO 11 Apply surveying techniques for layout and control

We were assessing students ability to create a topographic map, the visiting team did not deem this to be control, students do a lab with layout and control, the assessment tool has been changed.

SLO 7 Analyze construction documents

We were assessing student in our plan reading course, the visiting team felt we were assessing to the understand level. We do analyze documents in estimating 1 and the assessment tool is being developed and implemented in CM 331.

- SLO development and data collection

Still some minor issues with this; it takes some faculty a few prompts to input data or we have lapses due to change in faculty

SLO 8 and 15 did not have any meaningful data from the CM 323 class and were dropped from collection, these SLO still have at least 2 assessments

- Performance level accomplishment or trends

From last year's report

“Some SLOs have a performance criteria that 100% of the students will earn an X%. We do not meet our performance requirement for several of these and need to consider improvements. Our standard of 100%, while a noble goal, may never be achieved.”

The faculty decided to lower the performance level to 90% for SLO 1 writing, SLO 4 estimating, and SLO 17 Law. After discussion it appeared what was skewing the data lower was late submissions. It was felt better to account for this by lowering the standard.

Appendix A Historical Program Outcome Data AY 2017/18

		1 WRITE	2 ORAL	3 SAFE	4 EST	5 SCH	6 ETHIC	7 DOCS	8 METHOD	9 MULIT TEAM	10 TECH	11 SURVEY	12 DELIVERY	13 RISK	14 ACCT	15 QC	16 CONTROL	17 LAW	18 SUSTAIN	19 STRUCT	20 MEP
CM 301	Write	DA																			
CM 310	Intro												DA								
CM 311	Docs							DA													
CM 312	Acct														DA						
CM 313	Meth									DA											
CM 321	Mech																				DA
CM 322	Elect																				DA
CM 323	Meth 2								DA							DA					
CM 332	Equip								DA												
CM 331	Est 1				DA																
CM 333	Safe			DA																	
CM 334	Survey											DA									
CM 335	Sustain																		DA		
CM 410	Est 2				DA																
CM 411	Sched					DA											DA				
CM 412	Practice						DA							DA							
CM 414	Virtual										DA										
CM 420	Temp Str																				DA
CM 421	PM																DA				
CM 417	R PM															DA					
CM 422	Comp App										DA										
CM 423	Law																		DA		
CM 431	Capstone		DA	DA		DA															
CM 434	Lean																DA				
Exit Survey		IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA

≥ Performance criteria,

< Performance criteria,

Missing SLO tool,

Missing SLO data

Degree Program Objectives Data 2015-2020

	2015/6	2016/7	2017/8	2018/9	2019/0
Students Admitted	70	60	69	68	
Transfer Students Admitted	11	11	12	12	
Placement Rate	83%*	87%*	98%*	96%	
Average Starting Salary	\$62.5K	\$64.25K	\$65.1K	\$68.6K	
ACCE	F ₁	F ₂	F ₂	F ₃	
Internships	66	59	56	67	

* At time of exit survey, antidotal evidence points toward 100%

F₁ Completed 3 year report to ACCE

F₂ ACCE approved 3rd year report

F₃ ACCE reaccredit July 2019

Appendix B
Historical SLO Data

Appendix C Faculty and CIAC review and recommendations

At the faculty retreat on 17 September 2019 the faculty reviewed the end-of-year report and each SLO assessment data in detail. Assessment data was reviewed by CIAC on 11 October 2019. CIAC reviewed six of the SLOs that they are most concerned with, SLO 1, 4, 5, 12 and 17, CIAC also reviewed SLO 11 and 20 since it appeared students did not meet the performance level in our indirect assessment.

Overall

The department now has (in most cases) four years' worth of data. Most SLOs are being accomplished and are close to or meet performance levels. A few SLOs need attention and will be discussed in further detail.

SLO 1 Writing

Students are writing better.

The faculty decided to lower the performance level to 90% for SLO 1 writing. After discussion it appeared what was skewing the data lower was late submissions. It was felt better to account for this by lowering the standard.

SLO 2 Oral

Good trend.

SLO 3 Safety

Good trends.

SLO 4 Estimate

This SLO is another example of having a performance level that 100% of the students will achieve an 80% and the 100 was changed to 90% We are achieving this new standard.

SLO 5 Schedule

One section of capstone did not achieve the performance level and was actually quite low...needs to be monitored.

SLO 6 Ethics

The students did meet required performance levels and no specific actions are required.

SLO 7 Documents

This SLO was changed to be assessed in CM 331 Estimating.

SLO 8 Methods and equipment

The students did meet required performance levels and no specific actions are required.

SLO 10 Technology

Performance goals are being met and no specific action is required.

SLO 11 Surveying

This SLO was changed to assessed a different lab.

SLO 12 Project Delivery

Performance goals are being met and no specific action is required.

SLO 13 Risk

Students are meeting performance goals and no change is required.

SLO 14 Accounting

This class has been moved to the senior year since it is a more advanced topic. It was not offered in autumn 2018.

SLO 15 Quality

Performance goals are being met and no specific action is required.

SLO 16 Control

Students are meet performance criteria and no specific actions are anticipated.

SLO 17 Law

This SLO is another example of having a performance level that 100% of the students will achieve an 80% and the 100 was changed to 90% We are achieving this new standard

SLO 18 Sustainable

Performance goals are being met and no specific action is required.

SLO 19 Structures

Performance goals are being met and no specific action is required.

SLO 20 MEP

An indirect assessment from the students indicates they do not feel they have the knowledge expected from the MEP classes.

CIAC specifically discussed that more systems level education was needed in this area. The course focuses on the granular level. Several CIAC members offered to meet with the instructors to review the course material, the chair will facilitate this meeting. Another idea was to have our instructors attend the MEAC “Boot Camp”, the chair will make this training available to the faculty members.