Major Assessment Report

AY 2017-18

Department of Construction Management

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FRESNO STATE
Construction Management

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1. WHAT LEARNING OUTCOME(S) DID YOU ASSESS THIS YEAR?

List all program outcomes you assessed (if you assessed an outcome not listed on your department SOAP please indicate explain). Do not describe the measures or benchmarks in this section. Also, please only describe major assessment activities in this report. No GE assessment was required for the 2017-2018 academic year.

To meet new outcome-based program accreditation standards set forth by the Construction Management (CM) accrediting body ACCE, the CM department adopted the 20 ACCE student learning outcomes (SLOs) as the Program Learning Outcomes (PLOs) in 2016 and aligned major assessment with program accreditation efforts. For this academic year, the following ACCE SLOs/CM PLOs were assessed:

- SLO 1: Create written communications appropriate to the construction discipline.
- SLO 4: Create construction project cost estimates.
- SLO 5: Create construction project schedules.
- SLO 9: Apply construction management skills as a member of a multi-disciplinary team.
- SLO 10: Apply electronic-based technology to manage the construction process.
- SLO 14: Understand construction accounting and cost control.
- SLO 16: Understand construction project control processes.
- SLO 19: Understand the basic principles of structural behavior.

Accordingly, the following CM courses with which the above SLOs were associated were assessed in AY 2017-18 using Course Kaizen as the major assessment delivery method.

Course No. & Name	**Date Assessed**	**ACCE SLOs Assessed in AY 2017-18**							
		SLO 1	**SLO 4**	**SLO 5**	**SLO 9**	**SLO 10**	**SLO 14**	**SLO 16**	**SLO 19**
CM107: Advanced Construction Structures	3-16-2018								X
CM107L: Advanced Construction Structures Lab	3-16-2018	X			X				
CM110: Estimating and Bidding	5-10-2018		X						
CM116: Construction Scheduling	11-03-2017			X					
CM170: Construction Project Controls	1-26-2018					X	X	X	

2. WHAT ASSIGNMENT OR SURVEY DID YOU USE TO ASSESS THE OUTCOMES AND WHAT METHOD (CRITERIA OR RUBRIC) DID YOU USE TO EVALUATE THE ASSIGNMENT?

If the assignment (activity, survey, etc.) does not correspond to the activities indicated in the timeline on the SOAP, please indicate why. Please clearly indicate how the assignment/survey is able to measure a specific outcome. If after evaluating the assessment you concluded that the measure was not clearly aligned or did not adequately measure the outcome, please discuss this in your report. Please include the benchmark or standard for student performance in your assessment report (if it is stated in your SOAP then this information can just be copied into the report). An example of an expectation or standard would be "On outcome 2.3 we expected at least 80% of students to achieve a score of 3 or above on the rubric."

To facilitate the SLOs assessment planning and data collection, the department developed a course assessment matrix with specified assessment measures, minimum standards and assessment targets, and mandated its application in all major courses. Please note:

- Only CLOs that were mapped with assessed ACCE SLOs were presented in these matrices;
- The term "grade C" used in "Minimum Standards" and "Assessment Targets" was not referring to the letter grade but just a notion indicating that the level of assessed performance of a particular measure exceeded 70% in score or rubric levels.
- There are circumstances that an assessment measure is effort-based, and a Pass/Fail grading is used.

CM107: Advanced Construction Structures

#	Course Learning Outcomes (CLOs)	ACCE SLOs	Assessment Measures (D: Direct; ID: Indirect)	Minimum Standards	Assessment Targets
4	Demonstrate the overall understanding on the loads, stresses, and strains acting on a structure, as well as their relations and impact through simple design problems and case studies. (**Direct Assessment**)	**SLO 19**	D1: Homework Assignment 7 D2: Failure Case Study D3: Exam 3	70% (C)	≥ **80%** with grade **C** or better

CM107/L: Advanced Construction Structures Lab

#	Course Learning Outcomes (CLOs)	ACCE SLOs	Assessment Measures (D: Direct; ID: Indirect)	Minimum Standards	Assessment Targets
4	Develop written communication skills by writing technical reports.	**SLO 1**	D1: Individual Memos ID1: Lab 2 Group Reports	70% (C)	≥ **80%** with grade **C** or better
5	Perform experiments and associated tasks in a team environment.	**SLO 9**	ID1: Group Reports	70% (C)	≥ **80%** with grade **C** or better

CM110: Estimating and Bidding

#	Course Learning Outcomes (CLOs)	ACCE SLOs	Assessment Measures (D: Direct; ID: Indirect)	Minimum Standards	Assessment Targets
4	Analyze a set of specifications and drawings to present a logical, complete and accurate listing of labor, materials and equipment including their quantities in a format which then could be priced, and a labor analysis performed on it. **(Direct Assessment)**	**SLO 4**	**D1:** Exam 1 **ID1:** Exam 3	70% (C)	≥ **80%** of with grade **C** or better

CM116: Construction Scheduling

#	Course Learning Outcomes (CLOs)	ACCE SLOs	Assessment Measures (D: Direct; ID: Indirect)	Minimum Standards	Assessment Targets
1	Develop a resource loaded schedule for a project. **(Direct Assessment)**	**SLO 5**	**D1:** Lab Quiz 9 **D2:** Module Quiz 10	70% (C)	≥ **80%** of with grade **C** or better

CM170: Construction Project Controls

#	Course Learning Outcomes (CLOs)	ACCE SLOs	Assessment Measures (D: Direct; ID: Indirect)	Minimum Standards	Assessment Targets
4	Bid, plan, track, report, and evaluate a small construction project using technology as a member of a cross disciplinary team. **(Direct Assessment)**	**SLO 10**	**D1:** Team Project 2 Evaluation **ID1:** Course Deliverables 01	Pass	100% Pass
3	Produce common accounting reports and evaluate cash flow for a project. **(Direct Assessment)**	**SLO 14**	**D1:** Quiz 8 **D2:** Exam 2 **ID1:** Team Profit Report	70% (C)	D1, D2: ≥ **80%** of with grade **C** or better; ID1: 100% Pass
1	Describe management factors within a construction project (time, cost, safety, and quality). **(Direct Assessment)**	**SLO 16**	**D1:** Quiz 5 **D2:** Exam 1	70% (C)	≥ **80%** of with grade **C** or better

In AY 2017-18, the CM department also updated the **Alumni Survey** and **Senior Exit Survey** to reflect the new ACCE SLOs. Please find a copy of the questionnaires for both surveys in **7. Additional Guidelines** section.

3. WHAT DID YOU DISCOVER FROM THE DATA?

Discuss the student performance in relation to your standards or expectations. Be sure to clearly indicate how many students did (or did not) meet the standard for each outcome measured. Where possible, indicate the relative strengths and weaknesses in student performance on the outcome(s).

Assessment results of each ACCE SLO were presented below with details related to assessment targets. For each SLO, the CM faculty also discussed particular strengths and weakness in the Course Kaizen meetings.

SLO 1: Create written communications appropriate to the construction discipline (Enrollment N=15).

Measures	Target	Unsatisfactory (F: Below 60%)	Below Expectation (D: 60% ~ 69.9%)	Competent (C: 70% ~ 79.9%)	Proficient (B: 80% ~ 89.9%)	Advanced (A: 90% or Better)	% w/ C or better
D1: Lab 1 Memo	≥ **80%** with grade **C** or better	2	0	**4**	**2**	**7**	**86.7% Target Met**
ID1: Lab 2 Group Report	≥ **80%** with grade **C** or better	0	5	**5**	**5**	**0**	**66.7% Target Missed**

SLO 1 Discussion Notes:

- The enrollment in CM107/L was low so the assessment result was less representative.
- ACCE SLOs assessment cares about individual student's performance, so group report can only be used as an indirect measure.

SLO 4: Create construction project cost estimates (Enrollment N=31).

Measures	Target	Unsatisfactory (F: Below 60%)	Below Expectation (D: 60% ~ 69.9%)	Competent (C: 70% ~ 79.9%)	Proficient (B: 80% ~ 89.9%)	Advanced (A: 90% or Better)	% with C or better
D1: Exam 1	≥ **80%** with grade **C** or better	2	2	**11**	**10**	**6**	**87.1% Target Met**
ID1: Exam 3	≥ **80%** with grade **C** or better	0	0	**7**	**10**	**11**	**100.0% Target Met**

SLO 5: Create construction project schedules (Enrollment N=34).

Measures	Target	Unsatisfactory (F: Below 60%)	Below Expectation (D: 60% ~ 69.9%)	Competent (C: 70% ~ 79.9%)	Proficient (B: 80% ~ 89.9%)	Advanced (A: 90% or Better)	% with C or better
D1: Lab Quiz 9	≥ **80%** with grade **C** or better	2	4	**4**	**3**	**21**	**82.4%** **Target Met**
D2: Module Quiz 10	≥ **80%** with grade **C** or better	1	1	**6**	**7**	**19**	**94.1%** **Target Met**

SLO 9: Apply construction management skills as a member of a multi-disciplinary team (Enrollment N=15).

Measures	Target	Unsatisfactory (F: Below 60%)	Below Expectation (D: 60% ~ 69.9%)	Competent (C: 70% ~ 79.9%)	Proficient (B: 80% ~ 89.9%)	Advanced (A: 90% or Better)	% with C or better
ID1: Lab 2 Group Report	≥ **80%** with grade **C** or better	0	5	**5**	**5**	**0**	**66.7%** **Target Missed**

SLO 9 Discussion Notes:

- ACCE SLO 9 is one of the most challenging SLOs to assess due to the fact that students have to be individually assessed for their performance within an interdisciplinary team. In classroom teaching, this is very difficult to achieve.
- The measure used in this assessment was a group project report, which was assessed at group level. The report did not really reflect individual learning, thus can only be used as an indirect measure. More appropriate direct measures should be created. For that reason, SLO 9 will be assigned to a different course in next assessment cycle.

SLO 10: Apply electronic-based technology to manage the construction process (Enrollment N=34).

Measures	Target	No	Yes	% Pass
D1: Team Project 2 Evaluation	100% Pass	0	**34**	**100.0%** **Target Met**
ID1: Course Deliverables 01	100% Pass	0	**34**	**100.0%** **Target Met**

SLO 10 Discussion Notes

- Both direct and indirect measures for SLO 10 were Pass/Fail type of measure, which did not provide enough insights into actual student learning.
- The instructor used a 3rd party technology platform for the assessment, more comprehensive metrics could be developed with the help from the subject matter experts from the vendor.

SLO 14: Understand construction accounting and cost control (Enrollment N=34).

Measures	Target	Unsatisfactory (F: Below 60%)	Below Expectation (D: 60% ~ 69.9%)	Competent (C: 70% ~ 79.9%)	Proficient (B: 80% ~ 89.9%)	Advanced (A: 90% or Better)	% with C or better
D1: Quiz 8	≥ **80%** with grade **C** or better	8	4	**8**	**3**	**11**	**64.7% Target Not Met**
D2: Exam 2	≥ **80%** with grade **C** or better	1	5	**7**	**11**	**10**	**82.4% Target Met**

SLO 14 Discussion Notes

- Quiz 8 was quite challenging according to student feedback.
- There were 5 students who retook Exam 2 in order to pass, which was allowed via a rework credit.

SLO 16: Understand construction project control processes (Enrollment N=34).

Measures	Target	Unsatisfactory (F: Below 60%)	Below Expectation (D: 60% ~ 69.9%)	Competent (C: 70% ~ 79.9%)	Proficient (B: 80% ~ 89.9%)	Advanced (A: 90% or Better)	% with C or better
D1: Quiz 5	≥ **80%** with grade **C** or better	0	2	**3**	**4**	**25**	**94.1% Target Met**
D2: Exam 1	≥ **80%** with grade **C** or better	0	0	**6**	**12**	**16**	**100% Target Met**

SLO 16 Discussion Notes

- Exam 1 was a comprehensive review of construction project control principles, and students did very well.

- Some weaknesses were revealed including site supervision questions and lean construction questions, where less than 70% of students got them right. Future assessment might need to address these knowledge points.

SLO 19: Understand the basic principles of structural behavior (Enrollment N=14).

Measures	Target	Unsatisfactory (F: Below 60%)	Below Expectation (D: 60% ~ 69.9%)	Competent (C: 70% ~ 79.9%)	Proficient (B: 80% ~ 89.9%)	Advanced (A: 90% or Better)	% with C or better
D1: Homework Assignment 7.	≥ **80%** with grade **C** or better	4	0	**0**	**0**	**10**	**71.4%** **Target Missed**
D2: Failure Case Study	≥ **80%** with grade **C** or better	2	0	**0**	**8**	**4**	**85.7%** **Target Met**
D3: Exam 3	≥ **80%** with grade **C** or better	5	3	**3**	**3**	**0**	**42.9%** **Target Missed**

SLO 19 Discussion Notes

- SLO 19 has been a concern to the overall program assessment, and CM107 has been identified as a bottleneck course to our students.
- The instructor reflected on student engagement issues including absences and drop-outs.
- The instructor was committed to create more learning affordance to enhance student learning and engagement.

4. WHAT CHANGES DID YOU MAKE AS A RESULT OF THE DATA?

Describe how the information from the assessment activity was reviewed and what action was taken based on the analysis of the assessment data.

In preparation for the next ACCE Accreditation visit in 2019, the CM department has been conducting a comprehensive review of overall curriculum and individual courses since fall 2016. The goal is to coordinate all program learning outcome assessment efforts, including ACCE SLOs and SOAP, with course learning outcomes (CLOs) assessment. The ACCE SLOs and CM CLOs mapping is established, and all course instructors are aware of their individual assessment tasks.

Course Kaizens have been reaffirmed to be the major vehicle of program level assessment activity and utilized as an assessment data collection mechanism. A schedule for Course Kaizens has been established to both track all completed SLOs assessment results and plan for future assessment tasks. The Course Kaizens also increase the accountability of assessment at course/instructor level, with comprehensive documentation of assessment process, results, reflection and action plans.

The AY 2017-18 cycle was the 2nd year that such a highly integrated program assessment strategy was implemented. A lot of positive changes have been observed in comparison with previous efforts. However, due to recent curriculum and personnel changes, the AY 2017-18 assessment cycle also revealed some loopholes and deficiencies that should be addressed in the next academic year:

- There was a learning curve for faculty members in adapting learning assessment from topics-based approach to outcome-based approach. During our course Kaizen meetings, there were circumstances that faculty was not collecting the desired data needed for the assigned assessment tasks. Certain mapping between ACCE SLOs and CLOs was also problematic.
- Some SLOs assessment did not have adequate direct measures or the measures were not well designed, so the assessment results might not accurately reflect the SLOs. A good example is “SLO 9 - Apply construction management skills as a member of a multi-disciplinary team”. This SLO requires assessing individual performance in a team setting instead of assessing the team’s performance.
- Our accreditation body ACCE has also been making changes on acceptable assessment measures for specific SLOs. The standards and guidelines for conducting appropriate assessment are being updated at their annual and mid-year conferences. The assessment coordinator is responsible for informing the department and faculty to update their assessment efforts accordingly.
- Some incentives and creative means need to be created to better engage faculty, especially part-time faculty in the assessment process and enhance data collection efforts to help achieve more comprehensive and valid assessment results. Our part-time faculty are typically not trained for assessment. The assessment coordinator is creating a data collection worksheet to help streamline the data collection process in preparation of the upcoming ACCE reaccreditation visit.

5. WHAT ASSESSMENT ACTIVITIES WILL YOU BE CONDUCTING IN THE AY 2018-2019?

List the outcomes and measures or assessment activities you will use to evaluate them. These activities should be the same as those indicated on your current SOAP timeline; if they are not, please explain.

In AY 2018-19, the department will follow the assessment plan and Course Kaizen schedules laid out in the SOAP timeline. Specifically, the following ACCE SLOs will be assessed with the associated courses as indicated in the mapping table:

- SLO 1: Create written communications appropriate to the construction discipline.
- SLO 2: Create oral presentations appropriate to the construction discipline.
- SLO 3: Create a construction project safety plan.
- SLO 7: Analyze construction documents for planning and management of construction processes.
- SLO 9: Apply construction management skills as a member of a multi-disciplinary team.
- SLO 12: Understand different methods of project delivery and the roles and responsibilities of all constituencies involved in the design and construction process.
- SLO 15: Understand construction quality assurance and control.
- SLO 17: Understand the legal implications of contract, common, and regulatory law to manage a construction project.
- SLO 18: Understand the basic principles of sustainable construction.
- SLO 20: Understand the basic principles of mechanical, electrical and piping systems.

Course No. & Name	Assessment Date Planned	ACCE SLOs Planned to Assess in AY 2018-19									
		SLO 1	SLO 2	SLO 3	SLO 7	SLO 9	SLO 12	SLO 15	SLO 17	SLO 18	SLO 20
CM7S: Construction Materials & Basic Building Systems	Spring 2019									X	
CM18: Construction Graphics	Fall 2018		X			X					
CM20: Estimating and Bidding	Fall 2018	X			X		X				
CM122: Construction Laws	Fall 2018	X							X		
CM127: Construction Soils and Foundation	Fall 2018			X				X			
CM140: Building MEP	Fall 2018										X
CM180A: CM Capstone 1	Spring 2019	X				X					
CM180B: CM Capstone 2	Spring 2019	X	X			X					
CM193: Internship	Spring 2019		X				X				

6. WHAT PROGRESS HAVE YOU MADE ON ITEMS FROM YOUR LAST PROGRAM REVIEW ACTION PLAN?

Please provide a brief description of progress made on each item listed in the action plan. If no progress has been made on an action item, simply state "no progress."

All ACCE Accreditation issues and concerns from previous accreditation cycle have been addressed. The department also conducted several faculty retreats including a most recent meeting on August 22nd, 2018 to review department strategic plan. The strategic plan established new department mission, vision and core values, and summarized efforts to date in aligning assessments at accreditation, program and course levels. Performance criteria and assessment standards were also discussed.

CM Mission Statement (v3.0)

"*Develop* professionals, *Build* leaders, *Sustain* learners for the A/E/C Industry".

CM Vision Statement (v3.0)

"Build prominent engaged leaders in the regional, national, and international A/E/C industry".

CM Values (v3.0)

The Department of Construction Management is committed to:

- Excellence in teaching, mentoring, and leadership
- Professionalism and mutual respect
- Enriched, universal learning
- Collegiality and strong sense of academic community
- Strong ties with alumni and industry
- Diverse, family environment
- Work-life balance
- Community engagement
- Experiential learning

Educational Program Objectives (v2.0)

- Establish the technical and management abilities of a construction professional (project management)
- Manifest the qualities of a construction leader (business/team leadership)
- Define lifelong learning and list specific ways that you can continuously improve your knowledge, skills, and abilities throughout your construction career

7. ADDITIONAL GUIDELINES

If you have not fully described the assignment, then please attach a copy of the questions or assignment guidelines. If you are using a rubric and did not fully describe this rubric (or the criteria being used) than please attach a copy of the rubric. If you administered a survey, please consider attaching a copy of the survey so that the Learning Assessment Team (LAT) can review the questions.

To provide additional information on how individual SLOs were assessed, associated grading rubrics and survey questionnaires were included below.

SLO 1: Create written communications appropriate to the construction discipline.

- D1: Lab 1 Memo
- ID1: Lab 2 Group Report

Both Lab 1 Memo and Lab Group Report were assessed using grading rubrics.

Lab 1 Memo Grading Rubric					
Criteria	**Poor (20 pts)**	**Below Expectation (20 pts)**	**Meet Expectation (20pts)**	**Confident (20 pts)**	**Advanced (20 pts)**
Contents - Completion (30%)	Paper contains 50% or less of required deliverables	Paper contains 51%~69% of required deliverables	Paper contains 70%~79% of required deliverables	Paper contains 80%~89% of required deliverables	Paper contains 90%~100% of required deliverables
Contents - Accuracy (30%)	Little information is provided in the deliverables with poor accuracy	Some information is provided in the deliverables with low accuracy	Solid information is provided in the deliverables with acceptable accuracy	Great amount of information is provided in the deliverables with good accuracy	Excellent coverage of information in the deliverables with impeccable accuracy
Formatting (20%)	No obvious efforts in compliance with formatting requirements	Some efforts in compliance with formatting requirements	Acceptable formatting, quite a few mistakes and inconsistencies	Good and consistent formatting, very few mistakes	Excellent formatting, almost impeccable consistency
Organization (20%)	No obvious efforts in logical organization	Poor logical organization	Acceptable logical organization	Good logical organization	Excellent logical organization

Lab 2 Group Report Grading Rubric					
Criteria	**Poor (20 pts)**	**Below Expectation (20 pts)**	**Meet Expectation (20pts)**	**Confident (20 pts)**	**Advanced (20 pts)**
Contents - Completion (25%)	Report contains 50% or less of required project deliverables	Report contains 51% - 69% or less of required project deliverables	Report contains 70% - 79% or less of required project deliverables	Report contains 80% - 89%or less of required project deliverables	Report contains 90% - 100% of required project deliverables

Contents - Accuracy (25%)	Little information is provided in the deliverables with poor accuracy	Some information is provided in the deliverables with low accuracy	Solid information is provided in the deliverables with acceptable accuracy	Great amount of information is provided in the deliverables with good accuracy	Excellent coverage of information is provided in the deliverables with impeccable accuracy
Formatting (25%)	No obvious efforts in compliance with formatting requirements	Some efforts in compliance with formatting requirements	Acceptable formatting, quite a few mistakes and inconsistencies	Good and consistent formatting, very few mistakes	Excellent formatting, almost impeccable consistency
Organization/ Collaboration (25%)	No obvious efforts in logical organization of the report contents; no group collaboration	Poor organization of the report contents and little sign of group collaboration	Acceptable report organization and group collaboration	Good report organization and apparent group collaboration	Excellent manual organization and highly consistent group collaboration

SLO 4: Create construction project cost estimates.

- D1: Exam 1
- ID1: Exam 3

SLO 5: Create construction project schedules.

- D1: Lab Quiz 9
- D2: Module Quiz 10

The questions used for the two quizzes and the assessment analysis of these questions can be viewed here.

SLO 9: Apply construction management skills as a member of a multi-disciplinary team.

- ID1: Lab 2 Group Report

Please refer to **SLO 1** for the *Lab 2 Group Report Grading Rubric*.

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

- D1: Term Project 2 Evaluation
- ID1: Course Deliverables 01

Term Project 2 Evaluation was assessed using a grading rubric.

Criteria	Unsatisfactory (0%)	Below Expectation (65%)	Competent (75%)	Proficient (85%)	Advanced (100%)
Production Management	Project not completed near original schedule. Team did not track production throughout the project. No	Project not completed near original schedule. Team did not fully track production. The Last Planner	Completed project near original schedule. Completed most of the Last Planner System forms. Started each day	Completed project on original schedule. Consistently completed all Last Planner System forms. Started	Completed project on original schedule. Accurately and consistently completed all Last Planner System forms. Started each

	management effort in this category	System was not utilized effectively.	with a Stand-Up Meeting. Made some process improvements throughout the construction phase.	each day with a Stand-Up Meeting. Made some process improvements throughout the construction phase.	day with a Stand-Up Meeting. Consistently made process improvements throughout the construction phase.
Cost Management	Project not completed near original budget. Team did not track budget throughout the project. No management effort in this category.	Project not completed near original budget. Team did not fully track budget throughout the project.	Completed project near original budget. Inconsistently tracked budget throughout the project.	Completed project on original budget. Accurately and consistently tracked budget throughout the project.	Completed project on or under original budget. Accurately and consistently tracked budget throughout the project.

ID1: Course Deliverables 01 used a vendor-provided certificate as the assessment. Please refer to http://learn.procore.com/procore-fundamentals for details.

SLO 14: Understand construction accounting and cost control.

- D1: Quiz 8
- D2: Exam 2

A copy of the Quiz 8 - Assessment Analysis using Blackboard can be found here.
A copy of Exam 2 - Assessment Analysis using Blackboard can be found here.

SLO 16: Understand construction project control processes.

- D1: Quiz 5
- D2: Exam 1

SLO 19: Understand the basic principles of structural behavior.

- D1: Homework Assignment 7.
- D2: Failure Case Study
- D3: Exam 3

A copy of Homework Assignment 7 with solutions can be found here.
A copy of the Failure Case Study with Grading Rubric can be found here.