

**Colorado State University**

**Department of Construction Management**

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**2022 Annual Report on  
Student Learning Outcomes  
(SLOs)**

April 2023

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# Summary of the ACCE Assessment of the Construction Management Undergraduate Program

The Assessment Plan of the Bachelors of Science (B.S.) in Construction Management program at Colorado State University ensures continuous improvement of the program and its effectiveness in preparing students for the employment within the construction industry. Our program uses the following American Council for Construction Education (ACCE) Student Learning Outcomes (SLOs) to assess student learning.

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 multi-disciplinary 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.

## Assessment Tools for Measuring SLOs

Each SLO is assessed by at least one Direct Assessment tool and at least one Indirect Assessment tool. Direct Assessment is conducted via the assessment tools such as exams, assignments, presentations, and quizzes used in the specific required courses in which particular SLOs are assessed. For the Indirect Assessment, we use the Senior Exit Survey and Employer Survey. Senior Exit survey is conducted at the end of semester while the Employer Survey is distributed at the Fall and Spring Career Fairs. Data collection for both the Direct and Indirect assessments is conducted on a semester-basis, that is, in the fall and spring semesters. The collected data are evaluated by the Assessment Committee at the end of each collections cycle, and annually by the entire Department. The complete review of the SLOs with suggested action items occurs every two years for all 20 SLOs.

## Curriculum Mapping of 20 ACCE SLOs in the required CM courses (DA) and Indirect Assessment Tools (IA)

No.	Course	SLO 1	SLO 2	SLO 3	SLO 4	SLO 5	SLO 6	SLO 7	SLO 8	SLO 9	SLO 10	SLO 11	SLO 12	SLO 13	SLO 14	SLO 15	SLO 16	SLO 17	SLO 18	SLO 19	SLO 20	
CDN	Title	written	oral	safety	estim.	sched.	ethics	docum.	mat&meth	team	IT	survey	delivery	risk	acqtp.	QA/QC	control	contract	sustain	structure	MEP	
101	Introduction to Construction Management								DA				DA						DA			
131	Graphic Communications for Construction									DA												
151	Construction Materials and Methods	DA							DA													
192	Construction Management Seminar																					
251	Materials Testing and Processing								DA						DA							
253	Surveying and Construction Layout											DA										
265	Plan Reading and Quantity Survey							DA														
267	Construction Management Pre-Internship																					
317	Safety Management			DA										DA					DA			
353	Field Management for Construction							DA					DA									
358	Structural Systems for Construction I																				DA	
360	Electrical Systems in Construction				DA																	DA
365	Construction Estimating		DA		DA							DA										
366	Construction Equipment and Methods			DA	DA																	
367	Construction Contracts & Project Administration		DA					DA					DA						DA			
371	Mechanical and Plumbing Systems								DA							DA				DA		DA
459	Structures II																					
458	Structural Systems for Construction II																					DA
461	Construction Scheduling and Cost Control					DA						DA								DA		
462	Financial Management for Construction														DA					DA		
465	Construction Management Professional Practice	DA	DA				DA		DA													
469	Soil Mechanics for Construction	DA														DA						
487	Internship																					
	<b>TOTAL</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>2</b>
	Senior Exit Survey	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA
	Employer Survey	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA

DA = Direct Assessment    IA = Indirect Assessment

## Performance Criteria for Student Learning Outcomes (SLOs)

We established performance criteria (targets) for each assessment tool that is used to assess specific SLOs. For the Direct Assessment tools (e.g. exams, assignments, quizzes, presentations) used to measure 20 SLOs the performance criteria differ for each assessment tool. They are expressed in a format of 'percent of students meeting the specific target' (e.g. "80% of students will earn 80% or higher"). For the Indirect Assessment tools, the following targets are used for Senior Exit Survey (80% of students thought they were moderately, very or extremely prepared for a specific SLO) and for Employer Survey (80% of the employers thought our students that they hired in last two years were moderately, very or extremely prepared for a specific SLO).

## Evaluation Methodology for Direct Assessment SLO Data

Direct Assessment SLO data are reviewed by the Assessment Committee at the end of Fall and Spring semesters for the completion of the data and identification of the SLOs for which the targets (performance criteria) are not met. The Assessment Committee keeps track of these notes and then reviews them at the end of the two-year period during the complete review of SLOs. The two-semester SLO data (e.g. Spring and Fall in a calendar year) are presented in an annual report that is posted on the Department website and shared with other stakeholders (e.g. students, Professional Advisory Development Board (PADB), public) and also discussed with the faculty in the Department's regular meetings in Spring. A complete assessment review of SLO data is performed every two years when we analyze the courses in general, SLOs assessed in courses, assessment tools used to measure SLOs achievement (such as assignments, quizzes, exams, etc.), the expected SLO performance criteria (targets), and determine action items to address SLOs as needed and how a particular course could be improved. If corrective action is needed based on the complete review, changes are made at the two-year time interval.

## Evaluation Methodology for Indirect SLO Assessment Data

The Indirect SLO Assessment data collected via Senior Exit Survey and Employer Survey are evaluated every semester by the Assessment Committee. If the expected targets are not met, the Committee discusses the potential reasons. The annual report prepared by the Assessment Committee Chair summarizes the two-semester Indirect SLO data (e.g. Spring and Fall in a calendar year) and is posted on the Department website and, therefore, shared with other stakeholders (e.g. students, Professional Advisory Development Board (PADB), public). Annual evaluation of the data is done by discussing the annual report with the faculty and staff in the Department's regular meetings in Spring. A complete review for SLO indirect assessment data is performed by the assessment committee every two years in January. If there is a need to complete an additional review (e.g. some targets are not met) the committee reaches out to industry (that is, the PADB or the Curriculum Committee of the PADB).

**The following pages show 20 SLO data, and instructor and assessment committee rationale for targets not met.**

# SLO 1

## Create Written Communications Appropriate to the Construction Discipline

This SLO is assessed with three direct assessment (DA) measures and two indirect assessment (IA) measures as shown in the table below. The table shows annual data.

SLO 1		Create written communications appropriate to the construction discipline			2022	2022
Type	Course (DA) or Survey (IA)	Assessment Tool	Target (Performance Criteria)	Spring	Fall	
DA	CON 151	Construction Materials and Methods	Concrete Failures Assignment  Concrete Forensics Scenario (used only in Spring 2022)	80% of students will earn 70% or higher  80% of students will earn 80% or higher (new target starting Spring 2022)	83.0%	91.0%
	CON 465	Construction Management Professional Practice	Contract Type Proposal	80% of students will earn 80% or higher	78.7%	79.7%
	CON 469	Soil Mechanics for Construction	Geotechnical Report/Lab Report	80% of students will earn 80% or higher	86.4%	92.0%
IA	Senior Student Exit Survey		Question on how students feel prepared for this SLO	80% of students thought they were moderately, very or extremely prepared	97.8%	95.9%
	Employer Survey		Question on how employer perceive students being prepared for this SLO	80% of the employers thought students they hired in last two years were moderately, very or extremely prepared	100.0%	100.0%

### COLOR LEGEND

	Not meeting the target
	Border line (within 2% of the target)
	Meeting the target (within the 7% of the target)
	High target values (within 8% and above of the target)

### Rationale for targets not met:

**CON 465, Spring 2022, Contract Type Proposal:** Majority of points were lost for not following direction on page count.

## SLO 2

### Create Oral Presentations Appropriate to the Construction Discipline

This SLO is assessed with two direct assessment (DA) measures and two indirect assessment (IA) measures as shown in the table below. The table shows annual data.

SLO 2		Create oral presentations appropriate to the construction discipline			2022	2022
Type	Course (DA) or Survey (IA)	Assessment Tool	Target (Performance Criteria)	Spring	Fall	
DA	CON 317	Safety Management	Safety Moment (Briefings)	80% of students will earn 80% or higher	Assessment tool removed	
	CON 365	Construction Estimating	Bid Day presentations	80% of students will earn 80% or higher	Assessed for the first time in Fall 2022	100.0%
	CON 465	Construction Management Professional Practice	RFP Proposal presentation	80% of students will earn 80% or higher	77.5%	77.0%
IA	Senior Student Exit Survey	Question on how students feel prepared for this SLO	80% of students thought they were moderately, very or extremely prepared	93.3%	93.2%	
	Employer Survey	Question on how employer perceive students being prepared for this SLO	80% of the employers thought students they hired in last two years were moderately, very or extremely prepared	94.4%	100.0%	

#### COLOR LEGEND

	Not meeting the target
	Border line (within 2% of the target)
	Meeting the target (within the 7% of the target)
	High target values (within 8% and above of the target)

#### ***Rationale for targets not met:***

**CON 465, Spring 2022, RFP Proposal presentation:** Students readjusting to in person classes.

**CON 465, Fall 2022, RFP Proposal presentation:** Several students were dressed too casually, the instructor will do a better job emphasizing dress code to the students next semester.

## SLO 3

### Create a Construction Project Safety Plan

This SLO is assessed with one direct assessment (DA) measure and two indirect assessment (IA) measures as shown in the table below. The table shows annual data.

SLO 3		Create a construction project safety plan			2022	2022
Type	Course (DA) or Survey (IA)	Assessment Tool	Target (Performance Criteria)	Spring	Fall	
DA	CON 317	Safety Management	Individual Project Safety Plan	80% of students will earn 80% or higher	79.0%	77.6%
	CON 366	Construction Equipment and Methods	Crane Pick Safety Plan	85% of students will earn 80% or higher	91.07%	Assessment tool removed
IA	Senior Student Exit Survey		Question on how students feel prepared for this SLO	80% of students thought they were moderately, very or extremely prepared	94%	89.04%
	Employer Survey		Question on how employer perceive students being prepared for this SLO	80% of the employers thought students they hired in last two years were moderately, very or extremely prepared	87%	100%

#### COLOR LEGEND

	Not meeting the target
	Border line (within 2% of the target)
	Meeting the target (within the 7% of the target)
	High target values (within 8% and above of the target)

#### ***Rationale for targets not met:***

**CON 317, Spring 2022, Individual Project Safety Plan:** CON 317 Individual Project Safety Plan: Target would have been achieved if late penalties would not have come into play. An extraordinary # of students turned in their work late for this assignment.

**CON 317, Fall 2022, Individual Project Safety Plan:** Higher percentage than normal of students who performed poorly on assignment, grading rubric remained the same. Two sections were challenged, and one section did very well.



# SLO 4

## Create Construction Project Cost Estimates

This SLO is assessed with three direct assessment (DA) measures and two indirect assessment (IA) measures as shown in the table below. The table shows annual data.

SLO 4		Create construction project cost estimates			2022	2022
Type	Course (DA) or Survey (IA)		Assessment Tool	Target (Performance Criteria)	Spring	Fall
DA	CON 360	Electrical Systems in Construction	Electrical Project #2 CHS (Estimate)	80% of students will earn 80% or higher	97.1%	94.8%
	CON 365	Construction Estimating	Project #2 Change Order Estimate	80% of students will earn 80% or higher	59.6%	100.0%
	CON 366	Construction Equipment and Methods	Dozer-Scraper Production	85% of students will earn 80% or higher	92.05%	100.00%
IA	Senior Student Exit Survey		Question on how students feel prepared for this SLO	80% of students thought they were moderately, very or extremely prepared	92.1%	93.2%
	Employer Survey		Question on how employer perceive students being prepared for this SLO	80% of the employers thought students they hired in last two years were moderately, very or extremely prepared	88.2%	91.7%

### COLOR LEGEND

	Not meeting the target
	Border line (within 2% of the target)
	Meeting the target (within the 7% of the target)
	High target values (within 8% and above of the target)

### ***Rationale for targets not met:***

**CON 365, Spring 2022, Project #2 Change Order Estimate:** 8 students did not submit. Standards haven't changed, the quality of work this cohort submitted was poor.

# SLO 5

## Create Construction Project Schedules

This SLO is assessed with two direct assessment (DA) measures and two indirect assessment (IA) measures as shown in the table below. The table shows annual data.

<b>SLO 5</b>		<b>Create construction project schedules</b>			<b>2022</b>	<b>2022</b>
<b>Type</b>	<b>Course (DA) or Survey (IA)</b>	<b>Assessment Tool</b>	<b>Target (Performance Criteria)</b>	<b>Spring</b>	<b>Fall</b>	
DA	CON 366	Construction Equipment and Methods	Equipment cycle times	85% of students will earn 80% or higher	90.9%	Assessment tool removed
	CON 461	Construction Scheduling	Exam 1	75% of students will earn 80% or higher	83.19%	94.40%
IA	Senior Student Exit Survey		Question on how students feel prepared for this SLO	80% of students thought they were moderately, very or extremely prepared	95.5%	90.4%
	Employer Survey		Question on how employer perceive students being prepared for this SLO	80% of the employers thought students they hired in last two years were moderately, very or extremely prepared	100.0%	100.0%

### COLOR LEGEND

	Not meeting the target
	Border line (within 2% of the target)
	Meeting the target (within the 7% of the target)
	High target values (within 8% and above of the target)

# SLO 6

## Analyze Professional Decisions Based on Ethical Principles

This SLO is assessed with one direct assessment (DA) measure and two indirect assessment (IA) measures as shown in the table below. The table shows annual data.

SLO 6		Analyze professional decisions based on ethical principles			2022	2022
Type	Course (DA) or Survey (IA)	Assessment Tool	Target (Performance Criteria)	Spring	Fall	
DA	CON 367	Construction Contracts/Project Administration	Ethical Dilemma Homework Assignment	90% of students will earn 80% or higher	99.05%	93.44%
	CON 465	Construction Management Professional Practice	Ethics in Safety	80% of students will earn 80% or higher	Assessed for the first time in Fall 22	91.9%
IA	Senior Student Exit Survey		Question on how students feel prepared for this SLO	80% of students thought they were moderately, very or extremely prepared	94.4%	93.2%
	Employer Survey		Question on how employer perceive students being prepared for this SLO	80% of the employers thought students they hired in last two years were moderately, very or extremely prepared	100%	100%

### COLOR LEGEND

	Not meeting the target
	Border line (within 2% of the target)
	Meeting the target (within the 7% of the target)
	High target values (within 8% and above of the target)

# SLO 7

## Analyze Construction Documents for Planning and Management of Construction Processes

This SLO is assessed with two direct assessment (DA) measures and two indirect assessment (IA) measures as shown in the table below. The table shows annual data.

<b>SLO 7</b>		<b>Analyze construction documents for planning and management of construction processes</b>			2022	2022
Type	Course (DA) or Survey (IA)		Assessment Tool	Target (Performance Criteria)	Spring	Fall
DA	CON 265	Plan Reading and Quantity Survey	Final Comprehensive Exam (subset of documents related questions)	80% of students will earn 80% or higher	79.5%	15.8%
	CON 351/353	Construction Field Management / Field Management for Construction	Site Logistics Plan	75% of students will earn 80% or higher	84.4%	66.2%
IA	Senior Student Exit Survey		Question on how students feel prepared for this SLO	80% of students thought they were moderately, very or extremely prepared	96.6%	95.9%
	Employer Survey		Question on how employer perceive students being prepared for this SLO	80% of the employers thought students they hired in last two years were moderately, very or extremely prepared	94.4%	100.0%

**COLOR LEGEND**

	Not meeting the target
	Border line (within 2% of the target)
	Meeting the target (within the 7% of the target)
	High target values (within 8% and above of the target)

***Rationale for targets not met:***

**CON 265, Fall 2022, Final Comprehensive Exam** (subset of documents related questions): This was the first in person assessment for the students for the semester as all other assessments were conducted online and they appeared to be extremely unsettled. One student did not take the final exam.

**CON 353, Fall 2022, Site Logistics Plan:** Students failed to turn in one of the 3 assignments.

# SLO 8

## Analyze Methods, Materials, and Equipment Used to Construct Projects

This SLO is assessed with three direct assessment (DA) measures and two indirect assessment (IA) measures as shown in the table below. The table shows annual data.

SLO 8		Analyze methods, materials, and equipment used to construct projects			2022	2022
Type	Course (DA) or Survey (IA)		Assessment Tool	Target (Performance Criteria)	Spring	Fall
DA	CON 151	Construction Materials and Methods	Concrete Failures Assignment Concrete Forensics Scenario (used only in Spring 2022)	80% of students will earn 80% or higher	83.0%	79.0%
	CON 251	Materials Testing and Processing	Materials - Concrete Slump & Compression Test Lab Report	85% of students will earn 80% or higher	95.4%	98.6%
	CON 371	Mechanical and Plumbing Systems	Plans & Specification Assignment (used in Spring 2022) Heat Load Analysis assignment (used in Fall 2022)	80% of students will earn 80% or higher 80% of students will earn 80% or higher	92.3%	100.0%
IA	Senior Student Exit Survey		Question on how students feel prepared for this SLO	80% of students thought they were moderately, very or extremely prepared	94.4%	93.2%
	Employer Survey		Question on how employer perceive students being prepared for this SLO	80% of the employers thought students they hired in last two years were moderately, very or extremely prepared	94.1%	100.0%

### COLOR LEGEND

	Not meeting the target
	Border line (within 2% of the target)
	Meeting the target (within the 7% of the target)
	High target values (within 8% and above of the target)

### *Rationale for targets not met:*

**CON 151, Fall 2022, Concrete Failures Assignment:** Only 1% below the target, this is the first semester we increased targets.

## SLO 9

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### Understand the Role of the Construction Manager as a Member of Different Multi-Disciplinary Project Teams

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This SLO is assessed with two direct assessment (DA) measures and two indirect assessment (IA) measures as shown in the table below. The table shows annual data.

SLO 9		Understand the role of the construction manager as a member of different multi-disciplinary project teams		2022	2022	
Type	Course (DA) or Survey (IA)		Assessment Tool	Target (Performance Criteria)	Spring	Fall
DA	CON 101	Introduction to Construction Management	CM Roles + Project Stages assignment	80% of students will earn 80% or higher	96.0%	82.0%
	CON 465	Construction Management Professional Practice	Contract Type Proposal	80% of students will earn 80% or higher	96.6%	77.0%
IA	Senior Student Exit Survey		Question on how students feel prepared for this SLO	80% of students thought they were moderately, very or extremely prepared	98.9%	97.26%
	Employer Survey		Question on how employer perceive students being prepared for this SLO	80% of the employers thought students they hired in last two years were moderately, very or extremely prepared	100.0%	100.0%

#### COLOR LEGEND

	Not meeting the target
	Border line (within 2% of the target)
	Meeting the target (within the 7% of the target)
	High target values (within 8% and above of the target)

#### ***Rationale for targets not met:***

**CON 465, Fall 2022, Contract Type Proposal:** A couple students chose to put no effort or minimal effort into the assignment.





# SLO 10

## Apply Electronic-based Technology to Manage the Construction Process

This SLO is assessed with three direct assessment (DA) measures and two indirect assessment (IA) measures as shown in the table below. The table shows annual data.

SLO 10		Apply electronic-based technology to manage the construction process			2022	2022
Type	Course (DA) or Survey (IA)		Assessment Tool	Target (Performance Criteria)	Spring	Fall
DA	CON 131	Graphic Communications for Construction	Revit Project 1 (AutoCAD Draw Assignment only in SP20 due to COVID)	70% of students will earn 85% or higher	86.0%	78.4%
	CON 365	Construction Estimating	Lab Exercise #3 - On-screen takeoff exercise	80% of students will earn 80% or higher	68.9%	77.5%
	CON 461	Construction Scheduling	Lab Assignment (Asta or Microsoft Project)	80% of students will earn 80% or higher	99.1%	92.1%
IA	Senior Student Exit Survey		Question on how students feel prepared for this SLO	80% of students thought they were moderately, very or extremely prepared	96.6%	87.7%
	Employer Survey		Question on how employer perceive students being prepared for this SLO	80% of the employers thought students they hired in last two years were moderately, very or extremely prepared	100.0%	100.0%

### COLOR LEGEND

	Not meeting the target
	Border line (within 2% of the target)
	Meeting the target (within the 7% of the target)
	High target values (within 8% and above of the target)

### Rationale for targets not met:

**CON 365, Spring 2022, Lab Exercise #3 - On-screen takeoff exercise:** 26 students were late or did not submit (50% penalty for late). Standards haven't changed, the quality of work this cohort submitted was poor.

**CON 365, Fall 2022, Lab Exercise #3 - On-screen takeoff exercise:** 12 students did not submit the assignment.

# SLO 11

## Apply Basic Surveying Techniques for Construction Layout and Control

This SLO is assessed with three direct assessment (DA) measures and two indirect assessment (IA) measures as shown in the table below. The table shows annual data.

SLO 11		Apply basic surveying techniques for construction layout and control			2022	2022
Type	Course (DA) or Survey (IA)	Assessment Tool	Target (Performance Criteria)	Spring	Fall	
DA	CON 261/253	Construction Surveying / Surveying and Construction Layout	Field Final Exam (full exam) (Assessment changed to Traverse Computation Assignment for FA20 only due to move to online instruction for COVID-19)	75% of students will earn 80% or higher	97.1%	Used until end of SP 22
			Survey layout (new assignment starting FA22)	80% of students will earn 80% or higher	New assessment tools implemented in Fall 2022	88.2%
			Survey control (new assignment starting FA22)	80% of students will earn 80% or higher		83.8%
	CON 351/353	Construction Field Management / Field Management for Construction	Layout Lab Quiz	75% of students will earn 80% or higher	87.5%	66.2%
IA	Senior Student Exit Survey		Question on how students feel prepared for this SLO	80% of students thought they were moderately, very or extremely prepared	73.0%	72.6%
	Employer Survey		Question on how employer perceive students being prepared for this SLO	80% of the employers thought students they hired in last two years were moderately, very or extremely prepared	91.7%	100.0%

**COLOR LEGEND**

	Not meeting the target
	Border line (within 2% of the target)
	Meeting the target (within the 7% of the target)
	High target values (within 8% and above of the target)

***Rationale for targets not met:***

**CON 353, Fall 22, Layout Lab Quiz:** Students did not attend.

**Indirect Assessment, Annual Review in April 2023:** Senior Exit Survey data did not meet the expected targets. A new faculty member revamped CON 261 in Fall 2022 to better prepare students for more practical use of equipment and tools, so the course is more construction-based than engineering-based.



# SLO 12

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## Understand Different Methods of Project Delivery and the Roles and Responsibilities of All Constituencies Involved in the Design and Construction Process

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This SLO is assessed with two direct assessment (DA) measures and two indirect assessment (IA) measures as shown in the table below. The table shows annual data.

<b>SLO 12</b>		<b>Understand different methods of project delivery and the roles and responsibilities of all constituencies involved in the design and construction process</b>			2022	2022
Type	Course (DA) or Survey (IA)		Assessment Tool	Target (Performance Criteria)	Spring	Fall
DA	CON 101	Introduction to Construction Management	Final Exam (subset of delivery related questions)	70% of students will earn 80% or higher	71.0%	77.5%
	CON 367	Construction Contracts/Project Administration	Post-Case Study Analysis	75% of students will earn 80% or higher	94.4%	87.9%
IA	Senior Student Exit Survey		Question on how students feel prepared for this SLO	80% of students thought they were moderately, very or extremely prepared	98.9%	93.2%
	Employer Survey		Question on how employer perceive students being prepared for this SLO	80% of the employers thought students they hired in last two years were moderately, very or extremely prepared	100.0%	100.0%

**COLOR LEGEND**

	Not meeting the target
	Border line (within 2% of the target)
	Meeting the target (within the 7% of the target)
	High target values (within 8% and above of the target)





# SLO 13

## Understand Construction Risk Management

This SLO is assessed with two direct assessment (DA) measures and two indirect assessment (IA) measures as shown in the table below. The table shows annual data.

SLO 13		Understand construction risk management			2022	2022
Type	Course (DA) or Survey (IA)	Assessment Tool	Target (Performance Criteria)	Spring	Fall	
DA	CON 317	Safety Management	Safety Risk Assessment/Job Hazard Analysis (JHA)	80% of students will earn 80% or higher 92.6%	85.07%	
	CON 462	Financial Management for Construction	Final Exam (risk questions)	80% of students will earn 80% or higher 80.2%	Assessment tool removed	
IA	Senior Student Exit Survey		Question on how students feel prepared for this SLO	80% of students thought they were moderately, very or extremely prepared 97.8%	89.04%	
	Employer Survey		Question on how employer perceive students being prepared for this SLO	80% of the employers thought students they hired in last two years were moderately, very or extremely prepared 100.0%	100.00%	

### COLOR LEGEND

	Not meeting the target
	Border line (within 2% of the target)
	Meeting the target (within the 7% of the target)
	High target values (within 8% and above of the target)

# SLO 14

## Understand Construction Accounting and Cost Control

This SLO is assessed with one direct assessment (DA) measure and two indirect assessment (IA) measures as shown in the table below. The table shows annual data.

SLO 14		Understand construction accounting and cost control		2022	2022	
Type	Course (DA) or Survey (IA)		Assessment Tool	Target (Performance Criteria)	Spring	Fall
DA	CON 462	Financial Management for Construction	Final Exam (accounting and EVA questions, used until the end of SP 22)	80% of students will earn 80% or higher	81.4%	18.5%
			Final Exam (new set of accounting and EVA questions starting FA 22)	80% of students will earn 80% or higher		
IA	Senior Student Exit Survey		Question on how students feel prepared for this SLO	80% of students thought they were moderately, very or extremely prepared	88.8%	83.6%
	Employer Survey		Question on how employer perceive students being prepared for this SLO	80% of the employers thought students they hired in last two years were moderately, very or extremely prepared	100.0%	100.0%

**COLOR LEGEND**

	Not meeting the target
	Border line (within 2% of the target)
	Meeting the target (within the 7% of the target)
	High target values (within 8% and above of the target)

***Rationale for targets not met:***

**CON 462, Fall 2022, Final Exam (new set of accounting and EVA questions starting FA 22):** Lack of personal responsibility, have job. 20 students achieved the 75% mark. Still not used to FTF contact and in person exams post covid. Many still have D for degree mindset.

# SLO 15

## Understand Construction Quality Assurance and Control

This SLO is assessed with three direct assessment (DA) measures and two indirect assessment (IA) measures as shown in the table below. The table shows annual data.

<b>SLO 15</b>		<b>Understand construction quality assurance and control</b>		<b>2022</b>	<b>2022</b>
<b>Type</b>	<b>Course (DA) or Survey (IA)</b>	<b>Assessment Tool</b>	<b>Target (Performance Criteria)</b>	<b>Spring</b>	<b>Fall</b>
DA	CON 251	Materials Testing and Processing	Materials - Concrete Slump & Compression Test Lab Report (QA/QC content)	85% of students will earn 80% or higher 92.31%	80% or higher 89.86%
	CON 371	Mechanical and Plumbing Systems	Plumbing Systems Quality Control assignment	80% of students will earn 80% or higher 89.74%	80% or higher 100.00%
	CON 469	Soil Mechanics for Construction	Lab: Sand Cone Test	80% of students will earn 85% or higher 94.05%	85% or higher 94.40%
IA	Senior Student Exit Survey		Question on how students feel prepared for this SLO	80% of students thought they were moderately, very or extremely prepared 94.38%	80% or higher 86.30%
	Employer Survey		Question on how employer perceive students being prepared for this SLO	80% of the employers thought students they hired in last two years were moderately, very or extremely prepared 100.00%	80% or higher 91.70%

**COLOR LEGEND**

	Not meeting the target
	Border line (within 2% of the target)
	Meeting the target (within the 7% of the target)
	High target values (within 8% and above of the target)

# SLO 16

## Understand Construction Project Control Processes

This SLO is assessed with two direct assessment (DA) measures and two indirect assessment (IA) measures as shown in the table below. The table shows annual data.

SLO 16		Understand construction project control processes			2022	2022
Type	Course (DA) or Survey (IA)		Assessment Tool	Target (Performance Criteria)	Spring	Fall
DA	CON 461	Construction Scheduling	Schedule Update & Project Controls Assignment	80% of students will earn 80% or higher	73.5%	86.4%
	CON 462	Financial Management for Construction	Final Exam (EVA questions), used until end of SP22  Final Exam (new subset of EVA questions starting FA22)	80% of students will earn 80% or higher  80% of students will earn 80% or higher	No data	50.8%
IA	Senior Student Exit Survey		Question on how students feel prepared for this SLO	80% of students thought they were moderately, very or extremely prepared	95.5%	91.8%
	Employer Survey		Question on how employer perceive students being prepared for this SLO	80% of the employers thought students they hired in last two years were moderately, very or extremely prepared	100.0%	100.0%

### COLOR LEGEND

	Not meeting the target
	Border line (within 2% of the target)
	Meeting the target (within the 7% of the target)
	High target values (within 8% and above of the target)

### ***Rationale for targets not met:***

**CON 461, Spring 2022, Schedule Update & Project Controls Assignment:** From instructor's experience, the students lose more points on the early assignments such as this one on as they are learning that there is a higher expectation of the quality of their homework.

**CON 462, Fall 2022, CON 462 Final Exam (new subset of EVA questions starting FA22):** Lack of personal responsibility, have job. 21 students achieved the 75% mark. Still not used to FTF contact and in person exams post covid. Many still have D for degree mindset.

# SLO 17

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## Understand the Legal Implications of Contract, Common, and Regulatory Law to Manage a Construction Project

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This SLO is assessed with two direct assessment (DA) measures and two indirect assessment (IA) measures as shown in the table below. The table shows annual data.

<b>SLO 17</b>		<b>Understand the legal implications of contract, common, and regulatory law to manage a construction project</b>			2022	2022
Type	Course (DA) or Survey (IA)		Assessment Tool	Target (Performance Criteria)	Spring	Fall
DA	CON 317	Safety Management	OSHA Regulatory Law Quiz	80% of students will earn 80% or higher	80.25%	56.72%
	CON 367	Construction Contracts/Project Administration	AIA Contracts Homework Assignment	85% of students will earn 85% or higher	90.18%	85.20%
IA	Senior Student Exit Survey		Question on how students feel prepared for this SLO	80% of students thought they were moderately, very or extremely prepared	88.76%	91.78%
	Employer Survey		Question on how employer perceive students being prepared for this SLO	80% of the employers thought students they hired in last two years were moderately, very or extremely prepared	93.33%	91.70%

**COLOR LEGEND**

	Not meeting the target
	Border line (within 2% of the target)
	Meeting the target (within the 7% of the target)
	High target values (within 8% and above of the target)

***Rationale for targets not met:***

**CON 317, Fall 2022, OSHA Regulatory Law Quiz:** This assessment was administered as part of final exam this semester. Even though students were told and encouraged what to study, the material was delivered early in the semester, and poor showing is attributable to not studying.





# SLO 18

## Understand the Basic Principles of Sustainable Construction

This SLO is assessed with two direct assessment (DA) measures and two indirect assessment (IA) measures as shown in the table below. The table shows annual data.

SLO 18		Understand the basic principles of sustainable construction			2022	2022
Type	Course (DA) or Survey (IA)		Assessment Tool	Target (Performance Criteria)	Spring	Fall
DA	CON 101	Introduction to Construction Management	Sustainability Quiz (full quiz)	70% of students will earn 80% or higher	84.0%	91.3%
	CON 371	Mechanical and Plumbing Systems	Sustainability assignment	80% of students will earn 80% or higher	82.05%	100.00%
IA	Senior Student Exit Survey		Question on how students feel prepared for this SLO	80% of students thought they were moderately, very or extremely prepared	78.7%	74.0%
	Employer Survey		Question on how employer perceive students being prepared for this SLO	80% of the employers thought students they hired in last two years were moderately, very or extremely prepared	100.0%	100.0%

### COLOR LEGEND

	Not meeting the target
	Border line (within 2% of the target)
	Meeting the target (within the 7% of the target)
	High target values (within 8% and above of the target)

### ***Rationale for targets not met:***

**Indirect Assessment, Annual Review in April 2023:** Senior Exit Survey data did not meet the expected targets. We recognize the issue. We don't have a required sustainability course, but sustainability is integrated throughout the curriculum. We will continue to monitor this SLO.

# SLO 19

## Understand the Basic Principles of Structural Behavior

This SLO is assessed with two direct assessment (DA) measures and two indirect assessment (IA) measures as shown in the table below. The table shows two-year data.

SLO 19		Understand the basic principles of structural behavior			2022	2022
Type	Course (DA) or Survey (IA)		Assessment Tool	Target (Performance Criteria)	Spring	Fall
DA	CON 359/358	Structures I / Structural Systems for Construction I	Exam 3	70% of students will earn 80% or higher	67.33%	64.04%
	CON 459/458	Structures II / Structural Systems for Construction II	Exam 3	70% of students will earn 80% or higher	47.83%	31.30%
IA	Senior Student Exit Survey		Question on how students feel prepared for this SLO	80% of students thought they were moderately, very or extremely prepared	96.63%	94.52%
	Employer Survey		Question on how employer perceive students being prepared for this SLO	80% of the employers thought students they hired in last two years were moderately, very or extremely prepared	100.00%	100.00%

### COLOR LEGEND

	Not meeting the target
	Border line (within 2% of the target)
	Meeting the target (within the 7% of the target)
	High target values (within 8% and above of the target)

### ***Rationale for targets not met:***

**CON 358, Spring 2022, Exam 3:** Only 2.67% lower than target. Exam 3 was very hard.

**CON 458, Spring 2022, Exam 3:** There were two sections of the course, one section was only 3% below the target. Instructor does not have explanation why the other section did poorly.

**CON 358, Fall 2022, Exam 3:** There were two sections of the course. One section achieved the target and the other did not. The instructor was not sure why this happened.

**CON 458, Fall 2022, Exam 3:** Very difficult exam.



# SLO 20

## Understand the Basic Principles of Mechanical, Electrical, and Piping Systems

This SLO is assessed with two direct assessment (DA) measures and two indirect assessment (IA) measures as shown in the table below. The table shows annual data.

SLO 20		Understand the basic principles of mechanical, electrical, and piping systems			2022	2022
Type	Course (DA) or Survey (IA)		Assessment Tool	Target (Performance Criteria)	Spring	Fall
DA	CON 360	Electrical Systems in Construction	Exam 1  Final Exam (new exam questions starting FA22)	80% of students will earn 80% or higher  80% of students will earn 80% or higher	93.83%	46.88%
	CON 371	Mechanical and Plumbing Systems	Final Exam (used only in SP 22)  Mechanical and Plumbing Systems assignment (starting Fall 2022)	75% of students will earn 70% or higher (new target starting SP 22)  80% of students will earn 80% or higher	87.18%	80.90%
IA	Senior Student Exit Survey		Question on how students feel prepared for this SLO	80% of students thought they were moderately, very or extremely prepared	68.54%	65.75%
	Employer Survey		Question on how employer perceive students being prepared for this SLO	80% of the employers thought students they hired in last two years were moderately, very or extremely prepared	82.35%	100.00%

### COLOR LEGEND

	Not meeting the target
	Border line (within 2% of the target)
	Meeting the target (within the 7% of the target)
	High target values (within 8% and above of the target)

***Rationale for targets not met:***

**CON 360, Fall 2022, Final Exam (new exam questions starting FA22):** This was also the first iteration of this test and it will need some adjustment.

**Indirect Assessment, Annual Review in April 2023:** Senior Exit Survey data did not meet the expected targets. We rotated instructors a lot in this course and could not assign/dedicate a faculty to teach MEP. We recognize a gap in this area. We hired a new faculty in Fall 2020 to teach MEP but they retired in Spring 2022. In Fall 2022, we hired a new faculty dedicated to MEP.