

**University of Washington**  
**Department of Construction Management**  
**Academic Quality Improvement Plan for**  
**Bachelor of Science in Construction Management Program**

This Academic Quality Improvement Plan provides details, guidelines and procedure for continuous quality improvement for the undergraduate BS in Construction Management.

**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.

**2. Degree Program Assessment Plan**

A comprehensive assessment plan provides complete continuous improvement of our undergraduate degree program.

**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:

- Number of students admitted each year
- Number of transfer students admitted each year
- Placement rate of graduates
- Accreditation by American Council for Construction Education (ACCE)
- Provide experiential learning opportunities for students.
  - Number of students with internships
  - Number of laboratory or field learning opportunities

**2.3. Program Learning Outcomes**

The program learning outcomes meets and exceeds 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 will be assessed for a minimum level of conformance and to the standard of the programs performance criteria. A template for the assessment of a SLO is found in Appendix A. Individual assessment tools for specific SLO’s are found in their respective notebooks. Appendix B shows the indirect assessment tool. Appendix C show when each SLO is directly assessed and Appendix D maps the SLO to the Course Learning Outcomes (CLOs).

Minimum level of conformance is limited to the 20 SLOs being assessed one direct measure and one indirect measure. Our plan is to directly assess each SLOs at different times during a student's tenure and measure all SLO's indirectly.

## 2.4 Assessment tools and frequency of Student Learning Outcomes Assessment

The following table provides a guide for what class has Student Learning Outcomes assessed. DA = Direct Assessment, IA = Indirect Assessment. This is also shown on a quarter by quarter bases in Appendix C.

		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					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										DA							
CM 334	Survey											DA									
CM 335	Sustain																		DA		
CM 410	Est 2				DA																
CM 411	Sched					DA											DA				
CM 414	Virtual										DA										
CM 412	Practice						DA							DA							
CM 420	Temp Str																				DA
CM 421	PM															DA					
CM 422	Comp App										DA										
CM 423	Law																	DA			
CM 431	Capstone		DA	DA		DA															
CM 432	Soils																				DA
CM 434	Lean																DA				
ARCH 321	Structures									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 and methodology for Student Learning Outcomes

The following tables list the specifics of the assessment tools that will be used and the performance criteria to measure the achievement of a student learning outcome. Specific learning outcomes assessment tools are attached.

#### 1. Create Written Communication appropriate to the construction discipline

Where assessed/ Who	Assessment item	Performance Criteria
CM 301 Construction Communications/ Instructor	Business letter assignment	90% of the students will earn greater than 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

2. Create oral presentations appropriate to the construction discipline

Where assessed/ Who	Assessment item	Performance Criteria
CM 431 Capstone/ Juror	Presentation to juror	100% of the students earn greater 40 out of 60 points
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. Create a construction project safety plan

Where assessed/ Who	Assessment item	Performance Criteria
CM 333 Safety/ Instructor	Safety plan for class project	At least 85% of students earn at least 85%
CM 431 Capstone/ Instructor	Site specific hazard analysis plan	80% of students score greater than 4 out of 5 points
Exit Survey/ Academic Advisor	Question on how well students feel they can accomplish SLO	Greater than 3. on scale of 1 to 5

4. Create construction project cost estimates.

Where assessed/ Who	Assessment item	Performance Criteria
CM 331 Construction Estimating/ Instructor	Concrete MTO as homework assignment	100% of students earn at least 80%
CM 410 Construction Estimating II/ Instructor	Self-perform/ GCs/ GMP estimate as homework assignment	100% of students earn at least 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

5. Create construction project schedules

Where assessed/ Who	Assessment item	Performance Criteria
CM 411 Project Planning and Control/ Instructor	Final exam question to develop WBS and an activity network	80% of students earn at least 80%
CM 431 Capstone/ Instructor	Create schedule of construction project with over 100 activities	80% of students earn at least 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

6. Analyze professional decisions based on ethical principles

Where assessed/ Who	Assessment item	Performance Criteria
CM 412/ Instructor	Ethics paper	85% of the students earn at least an 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

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

Where assessed/ Who	Assessment item	Performance Criteria
CM 311 Construction Contract Documents/ Instructor	Series of questions on final exam	80% of students earn at least 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

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

Where assessed/ Who	Assessment item	Performance Criteria
CM 323 Construction Methods and Materials II/ Instructor	Series of questions on midterm and final exams	45% of the students earn at least 80%
CM 332 Construction Equipment Management/ Instructor	Series of calculation on a midterm exam to find the quantities, cycle times and number of trips	75% of students earn greater than 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

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

Where assessed/ Who	Assessment item	Performance Criteria
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
Arch 321 Structures II/ Instructor		
Exit Survey/ Academic Advisor	Question on how well students feel they can accomplish SLO	Greater than 3.5 on scale of 1 to 5

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

Where assessed/ Who	Assessment item	Performance Criteria
CM 414 Virtual Construction / Instructor	Create BIM using software	100% of the students earn at least 80%
CM 422 Computer Applications in Construction/ instructor	Create a schedule using software	80% of students earn at least 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

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

Where assessed/ Who	Assessment item	Performance Criteria
CM 334 Construction Surveying/ Instructor	Students complete a level loop	90% of students are able to score at least a 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

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
CM 310 Introduction to the Construction Industry/ Instructor	Student interview papers and exam questions	100% of students score between 80-90%
Exit Survey/ Academic Advisor	Question on how well students feel they can accomplish SLO	Greater than 3.5 on scale of 1 to 5

13. Understand construction risk management.

Where assessed/ Who	Assessment item	Performance Criteria
CM 412 Construction practice/ Instructor	Develop risk mitigation plans for capstone project	85% of the student earn at least 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

14. Understand construction accounting and cost control

Where assessed/ Who	Assessment item	Performance Criteria
CM 312 Construction Accounting/ Instructor	Answer a series of 10 questions on a final exam	90% of the students earn greater than 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

15. Understand construction quality assurance and control

Where assessed/ Who	Assessment item	Performance Criteria
CM 323 Construction Methods and Materials II/ Instructor	Four laboratory reports are prepared by students	85% of students earn at least 85% on each lab report
CM 421 Project Management/ Instructor	Series of final exam questions that differential between active and passive QC	80% of students earn at least 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



16. Understand construction project control processes

Where assessed/ Who	Assessment item	Performance Criteria
CM 434 Lean Project Management/ Instructor	Series of five questions on final exam	85% of students earn at least 80%
CM 411 Construction Planning and Control/ Instructor	80% of students earn at least 80%	80% of students earn at least 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

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

Where assessed/ Who	Assessment item	Performance Criteria
CM 423 Construction law/ Instructor		
Exit Survey/ Academic Advisor	Question on how well students feel they can accomplish SLO	Greater than 3.5 on scale of 1 to 5

18. Understand the basic principles of sustainable construction

Where assessed/ Who	Assessment item	Performance Criteria
CM 335 Sustainable Construction/ Instructor	LEED Green Associate Exam	At least 90% of students pass exam
Exit Survey/ Academic Advisor	Question on how well students feel they can accomplish SLO	Greater than 3.5 on scale of 1 to 5

19. Understand the basic principles of structural behavior

Where assessed/ Who	Assessment item	Performance Criteria
CM 420 Temporary Structures/ Instructor	Series of questions on midterm exam	90% of students earn 90%
CM 432 Soils and Foundations/ Instructor	Series of questions on midterm exam	90% of students earn 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

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

Where assessed/ Who	Assessment item	Performance Criteria
CM 321 Mechanical Systems in Buildings/ Instructor		
CM 322 Electrical Systems in Buildings/ Instructor		
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. Assessment Implementation Plan**

Assessment evaluation data is 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 will be conducted as part of the CM 412 Construction Practices class and results will be available by 15 June each year. The department chair will collate the program assessment data and degree program objectives data for review at both an autumn faculty and Construction Industry Advisory Council (CIAC) meeting. Recommendations, improvements, corrective actions, and changes will be recorded and reflected in future appendices to this document.

The assessment data is stored on Goggle docs. The chair will email the link and reminders to faculty to upload the data.

Appendix A  
Detailed Direct Assessment Tools

See Attached in the format of the following template:

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## STUDENT LEARNING OUTCOME #

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SLO Direct quote from CM Quality Improvement Plan

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**Performance Criteria**

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X % of students earn at least Y %

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**Where Assessed**

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**Course:** CM XXX – Course title

**Quarter:** Autumn/ Winter/ Spring

**Instructor:** Name

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**Student Work Assessed**

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Explain the specific measurement tool. Could be exam questions, assignments, or other student work.

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**Rubric Used for Assessment**

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Provide the rubric you use to grade or evaluate the student work.

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Appendix B  
Detailed Indirect Direct Assessment Tool  
Senior Exit Survey

This survey is design to determine graduating senior's opinion on how well they accomplished the SLO.

On a scale of 1 to 5, please rate your level of agreement with each of the 20 statements below to how well the CM department prepared you with the necessary knowledge and skill. Select the most appropriate rating for each statement (1=strongly disagree and 5 strongly agree)

As part of earning a Bachelor of Science in Construction Management degree from UW I feel I have learned the following skills: (1 = not very well, 2 = below expectation for entry level position, 3 = just enough skill and knowledge to start work, 4 = above average knowledge, 5 = outstanding level of knowledge gained)

1. I am able to create written communications appropriate to the construction discipline.
2. I am able to create oral presentations appropriate to the construction discipline.
3. I am able to create a construction project safety plan.
4. I am able to create construction project cost estimates.
5. I am able to create construction project schedules.
6. I am able to analyze professional decisions based on ethical principles.
7. I am able to analyze construction documents for planning and management of construction processes.
8. I am able to analyze methods, materials, and equipment used to construct projects.
9. I am able to apply construction management skills as a member of a multidisciplinary team.

10. I am able to apply electronic-based technology to manage the construction process.
11. I am able to apply basic surveying techniques for construction layout and control.
12. I understand different methods of project delivery and the roles and responsibilities of all constituencies involved in the design and construction process.
13. I understand construction risk management.
14. I understand construction accounting and cost control.
15. I understand construction quality assurance and control.
16. I understand construction project control processes.
17. I understand the legal implications of contract, common, and regulatory law to manage a construction project.
18. I understand the basic principles of sustainable construction.
19. I understand the basic principles of structural behavior.
20. I understand the basic principles of mechanical, electrical and piping systems.

#### Program Objectives

1. Do you have a full time job after graduation?

## Appendix C Detailed Direct Assessment Tool Times

Required assessments quarter: Autumn, *Winter*, Spring

		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	<u>DA/DA/DA</u>																			
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 414	Virtual										DA										
CM 412	Practice						DA							DA							
CM 420	Temp Str																				DA
CM 421	PM														DA						
CM 422	Comp App										DA										
CM 423	Law																		DA		
CM 431	Capstone		DA	DA		DA															
CM 432	Soils																				DA
CM 434	Lean																DA				
ARCH 321	Structures									DA											

Appendix D Map SLO to CLO

ACCE SLO			Course Learning Outcomes (CLO)
No	ACCE Student Learning Outcome	ACCE Direct and Indirect Assessment	
1	Create written communications appropriate to the construction discipline.	CM 301 DA Exit Survey	CM 301, CM 412, CM 431, CM 432
2	Create oral presentations appropriate to the construction discipline.	CM 431, Exit Survey	CM 331, CM 413, CM 431
3	Create a construction project safety plan.	CM 333 DA, CM 431 DA, Exit Survey	CM 333, CM 421 CM 431
4	Create construction project cost estimates.	CM 331 DA, CM 410 DA Exit Survey	CM 312, CM 331, CM 410, CM 415, CM 421, CM 431
5	Create construction project schedules.	CM 411 DA, CM 431 DA, Exit Survey	CM 411, CM 421, CM 422, CM 431
6	Analyze professional decisions based on ethical principles.	CM 412 DA, Exit Survey	CM 310, CM 331, CM 410, CM 421, CM 412
7	Analyze construction documents for planning and management of construction processes.	CM 311 DA, Exit Survey	CM 311, CM 312, CM 321, CM 322, CM 331, CM 335, CM 410, CM 411, CM 421, CM 422, CMCM 431
8	Analyze methods, materials, and equipment used to construct projects.	CM 323 DA, CM 332, Exit Survey	CM 313, CM 323, CM 332, CM 415, CM 428, CM 431
9	Apply construction management skills as a member of a multi-disciplinary team.	CM 313 DA, ARCH 321 DA, Exit Survey	CM 313, CM 331, CM 335, CM 410, CM 413, CM 426
10	Apply electronic-based technology to manage the construction process.	CM 414 DA, CM 422 DA, Exit Survey	CM 410, CM 411, CM 422, CM 414
11	Apply basic surveying techniques for construction layout and control.	CM 334 DA, Exit Survey	CM 334

12	Understand different methods of project delivery and the roles and responsibilities of all constituencies involved in the design and construction process.	CM 310 DA, Exit Survey	CM 310, CM 313, CM 421
13	Understand construction risk management.	CM 412 DA, Exit Survey	CM 333, CM 412, CM 421, CM 431
14	Understand construction accounting and cost control.	CM 312 DA, Exit Survey	CM 312, CM 410, CM 421, CM 431
15	Understand construction quality assurance and control.	CM 323 DA, CM 421 DA, Exit Survey	CM 313, CM 323, CM 421
16	Understand construction project control processes.	CM 411 DA, CM 434 DA, Exit Survey	CM 312, CM 411, CM 421, CM 422
17	Understand the legal implications of contract, common, and regulatory law to manage a construction project.	CM 423 DA, Exit Survey	CM 310, CM 423, CM 431
18	Understand the basic principles of sustainable construction.	CM 335 DA, Exit Survey	CM 313, CM 335
19	Understand the basic principles of structural behavior.	CM 420 DA, CM 432 DA, Exit Survey IA	ARCH 320, ARCH 321, CM 432, CM 420
20	Understand the basic principles of mechanical, electrical and plumbing systems.	CM 321 DA, CM 322 DA, Exit Survey	CM 311, CM 321, CM 322