



# Washington State University Construction Management

## Academic Quality Improvement Plan Report for AY 19/20 Bachelor of Science in Construction Management

Page | 1

This report highlights the findings of the AY 2019/20 assessment cycle. It serves as the basis for the faculty and the Construction Management Advisory Board (CMAB) review during the fall of 2020. Recommendations and any plans for updates will be documented in "Appendix C - Observations & Recommendations Report".

### 1. Strategic Plan for the Educational Unit

The strategic plan for the Washington State University's Construction Management program is found in a separate document titled "CM Strategic Plan 2020-2025" dated November 17, 2020.

### 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 WSU Construction Management programs mission is to educate, prepare, and provide opportunities for our students to become valuable resources to our economy, the construction management profession, and the built environment.

#### 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 should be between 50-55: **Fall 2019 @ 56**
- Placement rate of graduates should be above 95%: **Spring 2020 @ 91% and Summer 2020 @ 100%**
- Accreditation by American Council for Construction Education (ACCE) is maintained: **Yes, 3-year report**
- Provide experiential learning opportunities for students: **Internship rates @ 90% for 3<sup>rd</sup> year and 85% for 2<sup>nd</sup> year students in addition to required course projects/requirements (estimate/schedule/capstone proposal)**

#### 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 (SLO's) will be assessed, reviewed, and results acted on annually. Student work was assessed for a minimum level of conformance and the standard of the programs performance criteria. Individual assessment tools for specific SLO's are found in their respective electronic folders.

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



# Washington State University Construction Management

## Academic Quality Improvement Plan Report for AY 19/20 Bachelor of Science in Construction Management

### 2.4 Assessment Tools for Student Learning Outcomes 2019/20

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 (30), IA = Indirect Assessment (20)

		1 WRITING	2 ORAL	3 SAFETY	4 ESTIMATE	5 SCHEDULE	6 ETHICS	7 DOCS	8 METHODS	9 MULTI TEAM	10 TECHNOLOGY	11 SURVEY	12 DELIVERY	13 RISK	14 ACCTG	15 QA/QC	16 CONTROLS	17 LAW	18 SUSTAIN	19 STRUCTURES	20 MEP	
CstM 102	Intro to Built Environment																					
CstM 201	Materials I								DA													
CstM 202	Materials II								DA													
CstM 222	Culture of CM																					
CstM 252	Admin & Const. Documentation	DA						DA			DA					DA						
CstM 254	Construction Graphics										DA											
CE 302	Intro to Surveying											DA										
CstM 332	Bldg. Science I																		DA			DA
CstM 333	Bldg. Science II																		DA			DA
CstM 356	Earthwork & Equipment								DA													
CstM 362	Law																		DA			
CstM 368	Safety			DA																		
CstM 370	Estimating I				DA		DA															
CstM 371	Estimating II				DA																	
CstM 451	Delivery Systems												DA									
CstM 460	Const. Cost Management													DA	DA							
CstM 462	Schedule					DA					DA											
CstM 473	Human Factors																					
CstM 475	Capstone		DA							DA												
Arch 351	Structures I																					
Arch 352	Structures II																					DA
Arch 463	Structures III																					DA
Survey	Sr. Exit Survey	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA	IA



# Washington State University

## Construction Management

### Academic Quality Improvement Plan Report for Bachelor of Science in Construction Management

#### 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.



# Washington State University Construction Management

## Academic Quality Improvement Plan Report for Bachelor of Science in Construction Management

### 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. A historical (and graphical) representation of this direct assessment data can be found in Appendix A - Detailed Direct Assessment Data and Appendix B - Detailed Indirect Assessment Data. This data will be discussed and reviewed for trends thereby resulting in identification of potential changes.

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

Where assessed/ Who	Assessment item	Performance Criteria	AY 2018/19	AY 2019/20	AY 2020/21	AY 2021/22
CstM 252 - Construction Administration & Documentation / Gunderson	Individual Course Assignment #2 & #5	At least 80% of students earn a C (70%) or better	89%	87%		
Exit Survey/ Program Head	Question on how well students feel they can accomplish SLO	Greater than 3.5 on scale of 1 to 5	4.57	4.45		

#### 2. Create oral presentations appropriate to the construction discipline

Where assessed/ Who	Assessment item	Performance Criteria	AY 2018/19	AY 2019/20	AY 2020/21	AY 2021/22
CstM 473 - Human Productivity in Construction / Adjunct	Oral Negotiations Assignment	At least 70% of students earn a C (70%) or better	not assessed	no longer assessed in course	no longer assessed in course	no longer assessed in course
CstM 475 - Senior Capstone / Cherf	Final Team Presentations - each student individually evaluated	At least 80% of students earn a C (70%) or better	85%	82%		
Exit Survey/ Program Head	Question on how well students feel they can accomplish SLO	Greater than 3.5 on scale of 1 to 5	4.23	4.29		

#### 3. Create a construction project safety plan

Where assessed/ Who	Assessment item	Performance Criteria	AY 2018/19	AY 2019/20	AY 2020/21	AY 2021/22
CstM 368 - Safety & Health / Cherf	Jobsite Safety Hazard Analysis plan for a specific project.	At least 80% of students earn a C (70%) or better	92%	86%		
Exit Survey/ Program Head	Question on how well students feel they can accomplish SLO	Greater than 3. on scale of 1 to 5	3.89	4.04		



# Washington State University Construction Management

## Academic Quality Improvement Plan Report for Bachelor of Science in Construction Management

4. Create construction project cost estimates

Where assessed/ Who	Assessment item	Performance Criteria	AY 2018/19	AY 2019/20	AY 2020/21	AY 2021/22
CstM 370 - Estimating I / Peschel	Final Exam - complete	At least 80% of students earn a C (70%) or better	85%	86%		
CstM 371 - Estimating II / Peschel	Series of Questions on Final Exam	At least 80% of students earn a C (70%) or better	51%	77%		
Exit Survey/ Program Head	Question on how well students feel they can accomplish SLO	Greater than 3.5 on scale of 1 to 5	4.26	4.18		

5. Create construction project schedules

Where assessed/ Who	Assessment item	Performance Criteria	AY 2018/19	AY 2019/20	AY 2020/21	AY 2021/22
CstM 102 - Intro to the Built Environment / Cherf	Individual Assignment #1 Test #2	At least 80% of students earn a C (70%) or better	95%	no longer assessed in course	no longer assessed in course	no longer assessed in course
CstM 462 - Planning & Scheduling / Gunderson	Individual Scheduling Projects B, C, and D	At least 80% of students earn a C (70%) or better	79%	77%		
Exit Survey/ Program Head	Question on how well students feel they can accomplish SLO	Greater than 3.5 on scale of 1 to 5	4.17	4.20		

6. Analyze professional decisions based on ethical principles

Where assessed/ Who	Assessment item	Performance Criteria	AY 2018/19	AY 2019/20	AY 2020/21	AY 2021/22
CstM 370 - Estimating I / Peschel	Individual Assignment (ia) #6 - Ethics Case Studies	At least 80% of students earn a C (70%) or better	94%	moved to CstM 473	moved to CstM 473	moved to CstM 473
CstM 473 - Human Productivity in Construction / Call	Series of Questions on Quizzes	At least 70% of students earn a C (70%) or better	not assessed	87%		
Exit Survey/ Program Head	Question on how well students feel they can accomplish SLO	Greater than 3.5 on scale of 1 to 5	4.47	4.43		



# Washington State University Construction Management

## Academic Quality Improvement Plan Report for Bachelor of Science in Construction Management

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

Where assessed/ Who	Assessment item	Performance Criteria	AY 2018/19	AY 2019/20	AY 2020/21	AY 2021/22
CstM 252 - Construction Administration & Documentation / Gunderson	Individual Lab Final/Exam	At least 80% of students earn a C (70%) or better	61%	94%		
Exit Survey/ Program Head	Question on how well students feel they can accomplish SLO	Greater than 3.5 on scale of 1 to 5	4.55	4.55		

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

Where assessed/ Who	Assessment item	Performance Criteria	AY 2018/19	AY 2019/20	AY 2020/21	AY 2021/22
CstM 201 - Materials I / Cherf	Series of Questions on <i>Quizzes + Homework + Final Exam</i>	At least 70% of students earn a C (70%) or better	92%	88%		
CstM 202 - Materials II / Call	Series of Questions on <i>Quizzes + Final Exam</i>	At least 70% of students earn a C (70%) or better	86%	99%		
CstM 356 - Earthwork & Equipment / Tafazzoli	Series of Questions on <i>Quizzes + Homework + Final Exam</i>	At least 70% of students earn a C (70%) or better	86%	92%		
Exit Survey/ Program Head	Question on how well students feel they can accomplish SLO	Greater than 3.5 on scale of 1 to 5	4.3	4.22		

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

Where assessed/ Who	Assessment item	Performance Criteria	AY 2018/19	AY 2019/20	AY 2020/21	AY 2021/22
CstM 475 - Senior Capstone / Cherf	Industry judges evaluation of students during the Capstone Competition.	At least 80% of students earn a C (70%) or better	83%	89%		
Exit Survey/ Program Head	Question on how well students feel they can accomplish SLO	Greater than 3.5 on scale of 1 to 5	4.32	4.29		



# Washington State University Construction Management

## Academic Quality Improvement Plan Report for Bachelor of Science in Construction Management

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

Where assessed/ Who	Assessment item	Performance Criteria	AY 2018/19	AY 2019/20	AY 2020/21	AY 2021/22
CstM 252 - Construction Administration & Documentation / Gunderson	Individual Assignment #2, #5, and #6	At least 80% of students earn a C (70%) or better	98%	no longer assessed in course	no longer assessed in course	no longer assessed in course
CstM 254 - Construction Graphics / Anderson	Midterm Exam (Lab), Final Project (Lab), and Homework Assignment – Bluebeam Revu	At least 80% of students earn a C (70%) or better	94%	86%		
CstM 462 - Planning & Scheduling / Gunderson	Individual Scheduling Projects B, C, and D	At least 80% of students earn a C (70%) or better	79%	77%		
Exit Survey/ Program Head	Question on how well students feel they can accomplish SLO	Greater than 3.5 on scale of 1 to 5	4.43	4.45		

11. Apply basic surveying techniques for construction layout and control

Where assessed/ Who	Assessment item	Performance Criteria	AY 2018/19	AY 2019/20	AY 2020/21	AY 2021/22
CE 302 - Introduction to Surveying / Olsen	Lab Exam – Exercises 1-3	At least 70% of students earn a C (70%) or better	41%	64%		
Exit Survey/ Program Head	Question on how well students feel they can accomplish SLO	Greater than 3.5 on scale of 1 to 5	3.38	3.29		

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 2018/19	AY 2019/20	AY 2020/21	AY 2021/22
CstM 451 - Delivery Systems / Gunderson	Individual Course Assignment #3 + Series of Questions on Quiz #'s 1-4 & Exam #'s 1 and 2	At least 80% of students earn a C (70%) or better	95%	91%		
Exit Survey/ Program Head	Question on how well students feel they can accomplish SLO	Greater than 3.5 on scale of 1 to 5	4.13	4.04		



# Washington State University Construction Management

## Academic Quality Improvement Plan Report for Bachelor of Science in Construction Management

### 13. Understand construction risk management

Where assessed/ Who	Assessment item	Performance Criteria	AY 2018/19	AY 2019/20	AY 2020/21	AY 2021/22
CstM 460 - Construction Cost Management / Call	Individual Assignment #1 + Series of Questions on Test #'s 1 and 3	At least 80% of students earn a C (70%) or better	92%	95%		
Exit Survey/ Program Head	Question on how well students feel they can accomplish SLO	Greater than 3.5 on scale of 1 to 5	4.17	4.14		

### 14. Understand construction accounting and cost control

Where assessed/ Who	Assessment item	Performance Criteria	AY 2018/19	AY 2019/20	AY 2020/21	AY 2021/22
CstM 460 - Construction Cost Management / Call	Individual Assignment #1 + Series of Questions on Test #'s 1 and 3	At least 80% of students earn a C (70%) or better	89%	83%		
Exit Survey/ Program Head	Question on how well students feel they can accomplish SLO	Greater than 3.5 on scale of 1 to 5	not assessed	4.00		

### 15. Understand construction quality assurance and control

Where assessed/ Who	Assessment item	Performance Criteria	AY 2018/19	AY 2019/20	AY 2020/21	AY 2021/22
CstM 252 - Construction Administration & Documentation / Gunderson	Series of Questions on Exam #2	At least 80% of students earn a C (70%) or better	93%	78%		
Exit Survey/ Program Head	Question on how well students feel they can accomplish SLO	Greater than 3.5 on scale of 1 to 5	4.23	4.35		





# Washington State University Construction Management

## Academic Quality Improvement Plan Report for Bachelor of Science in Construction Management

16. Understand construction project control processes

Where assessed/ Who	Assessment item	Performance Criteria	AY 2018/19	AY 2019/20	AY 2020/21	AY 2021/22
CstM 252 - Construction Administration & Documentation / Gunderson	Series of Questions on Exam #2	At least 80% of students earn a C (70%) or better	90%	87%		
CstM 460 - Construction Cost Management / Call	Individual Assignment #1 + Series of Questions on Test #'s 2 and 3	At least 80% of students earn a C (70%) or better	94%	83%		
Exit Survey/ Program Head	Question on how well students feel they can accomplish SLO	Greater than 3.5 on scale of 1 to 5	4.23	4.10		

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

Where assessed/ Who	Assessment item	Performance Criteria	AY 2018/19	AY 2019/20	AY 2020/21	AY 2021/22
CstM 362 - Construction Law / Austin	Three Non-Cumulative Exams and Two Writing Assignments	At least 80% of students earn a C (70%) or better	100%	100%		
Exit Survey/ Program Head	Question on how well students feel they can accomplish SLO	Greater than 3.5 on scale of 1 to 5	4.23	4.20		

18. Understand the basic principles of sustainable construction

Where assessed/ Who	Assessment item	Performance Criteria	AY 2018/19	AY 2019/20	AY 2020/21	AY 2021/22
CstM 332 - Building Science I / Day	Series of Questions on Quiz #'s 8 and #9 + Assignment #6	At least 80% of students earn a C (70%) or better	98%	90%		
CstM 333 - Building Science II / Day	Series of Questions on Midterm Exam + Series of Questions on Final Exam	At least 80% of students earn a C (70%) or better	97%	97%		
Exit Survey/ Program Head	Question on how well students feel they can accomplish SLO	Greater than 3.5 on scale of 1 to 5	4.28	4.22		



# Washington State University Construction Management

## Academic Quality Improvement Plan Report for Bachelor of Science in Construction Management

19. Understand the basic principles of structural behavior

Where assessed/ Who	Assessment item	Performance Criteria	AY 2018/19	AY 2019/20	AY 2020/21	AY 2021/22
Arch 352 - Structures II / Ibrahim (Adjunct)	Series of Questions on Midterm Exam	At least 80% of students earn a C (70%) or better	not assessed	not assessed		
Arch 463 - Structures III / Ibrahim (Adjunct)	Series of Questions on Midterm Exam	At least 80% of students earn a C (70%) or better	not assessed	98%		
Exit Survey/ Program Head	Question on how well students feel they can accomplish SLO	Greater than 3.5 on scale of 1 to 5	4.02	3.94		

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

Where assessed/ Who	Assessment item	Performance Criteria	AY 2018/19	AY 2019/20	AY 2020/21	AY 2021/22
CstM 332 - Building Science I / Day	Series of Questions on Quiz #'s 1-7 and 8-10 + Assignment #'s 2-8 and 10 + Series of Questions on Final Exam	At least 80% of students earn a C (70%) or better	98%	90%		
CstM 333 - Building Science II / Day	Series of Questions on Midterm Exam + Series of Questions on Final Exam	At least 80% of students earn a C (70%) or better	97%	97%		
Exit Survey/ Program Head	Question on how well students feel they can accomplish SLO	Greater than 3.5 on scale of 1 to 5	3.91	4.24		



# Washington State University

## Construction Management

### Academic Quality Improvement Plan for Bachelor of Science in Construction Management

Page | 11

#### 3. Assessment Implementation Plan

Assessment evaluation data was due to the program coordinator by the 15<sup>th</sup> of each month after a semester. The senior exit survey was conducted online via Qualtrics and results were made available by July 15<sup>th</sup> of same year. The program coordinator collated the program assessment data and degree program objectives data into a report for review at both a fall faculty retreat/meeting and the fall Construction Management Advisory Board (CMAB) meeting. Recommendations, improvements, corrective actions, and changes will be recorded (or appended as necessary) and reflected in future appendices (Appendix C) to this report.

#### 4. Program Findings & Recommendations

AY 2017/18 was spent in preparation of and completion of our assessment plan but also included a finalization of curriculum mapping and assessment tool + rubric development. AY 2018/19 was our first complete year of collecting data after development of our current assessment plan. The information below outlines our data analysis, observations, and recommendations. We have worked to address 1. Conformance with ACCE assessment guidelines; 2. SLO development and data collection; 3. Performance level accomplishment and/or trends for direct assessment tools/areas; and 4. Performance level accomplishment and/or trends for indirect assessment tools/areas. The AY 2018/2019 assessment cycle led to the modification of several assessment tools, a reduction of four (4) direct assessment tools, and adjustment to where specific SLO's were assessed. These changes were based upon input from the faculty and further analysis of curriculum in relation to our curriculum mapping. It is believed that the adjustments have proven successful.

Further information can be found in Appendix C - Observations & Recommendations Report.

**Findings:** This process continues to be challenging to incorporate into an already busy workload of the CM faculty plus faculty from Architecture, Landscape Architecture, and Civil Engineering. We have had regular meetings to reinforce the assessment protocols and procedures which have resulted in a high level of buy-in. It seems that everyone is growing accustomed to the assessment system that we have established. Considering that this is our second complete cycle, the outcome has been positive and faculty have learned that changes could be made in a variety of courses relative to assessment tools. Although we have had some challenges in collecting data (data not received) for courses taught by adjunct faculty in Architecture we are still following the ACCE guidelines. It is worth noting that permanent faculty require minimal reminders to input data by the required deadlines each semester. Moving forward, the entire process is becoming more fluid.

In reviewing the data and results, the following observations were made:

- 26 of 27 required SLO direct assessment tools were completed as of May 15. All but one (1) tool was completed. As mentioned prior this was due to challenges associated with adjunct faculty teaching courses in the 2019/20 AY.
- 20 of 20 required SLO indirect assessment tools were completed by May 15.
- All of the direct assessment performance criteria were met except:
  - SLO #4 (estimate) – one of two tools
  - SLO #5 (schedule) – zero of one tools
  - SLO #10 (technology) – one of two tools
  - SLO #11 (surveying) – zero of one tools
  - SLO #15 (quality) - zero of one tools



# Washington State University Construction Management

## Academic Quality Improvement Plan for Bachelor of Science in Construction Management

Page | 12

- All of the indirect assessment performance criteria were met except:
  - SLO #11 (surveying) – students do not feel they can apply basic surveying for construction layout.

#### **4. CMAB Responses & Recommendations**

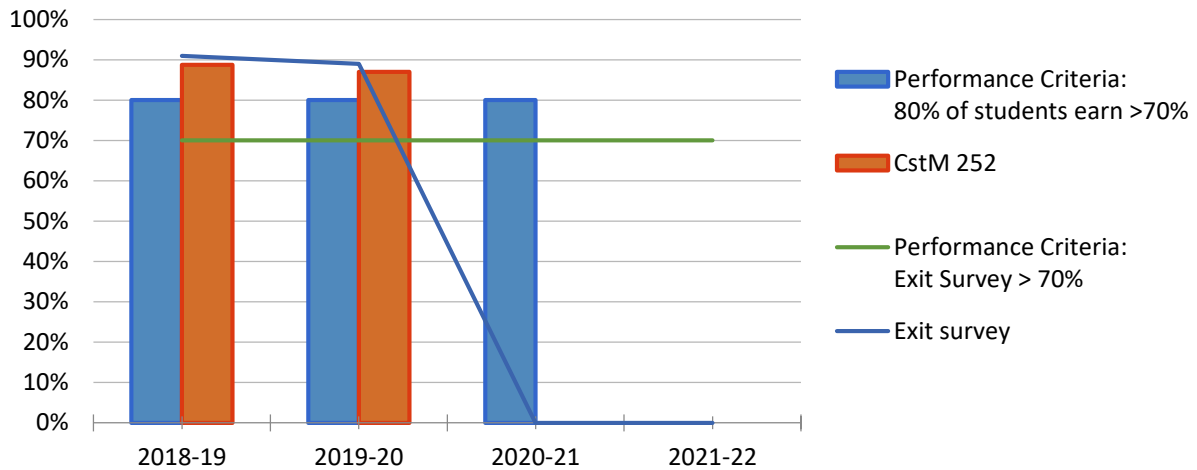
The outcomes of our assessment efforts including, but not limited to, the Observations & Recommendations Report are presented to the CMAB at a fall meeting for discussion and/or further recommendations. The minutes covering this portion of the meeting have been affixed to Appendix C - Observations & Recommendations Report.



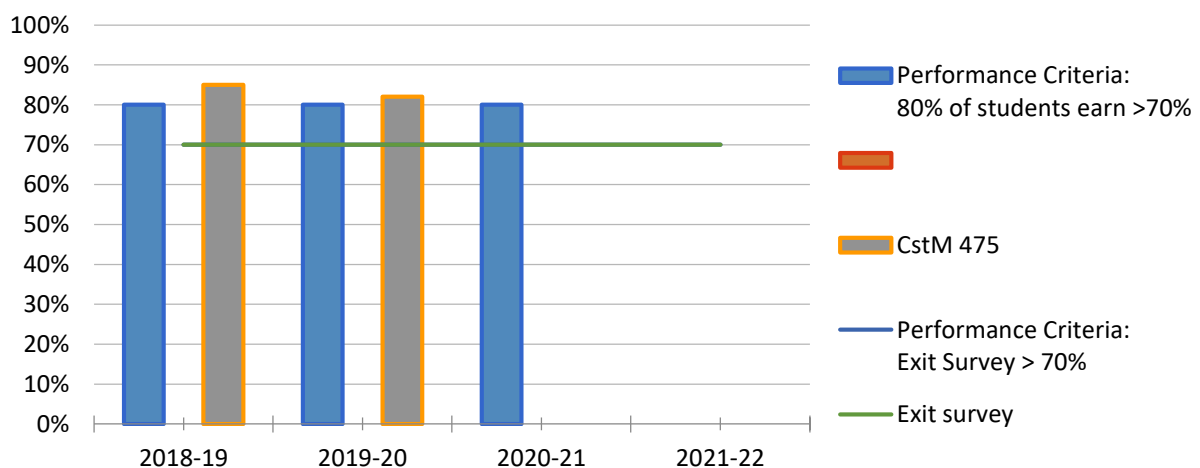
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## Appendix A Detailed Direct Assessment Data

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



### SLO 2: Create oral presentations appropriate to the construction discipline

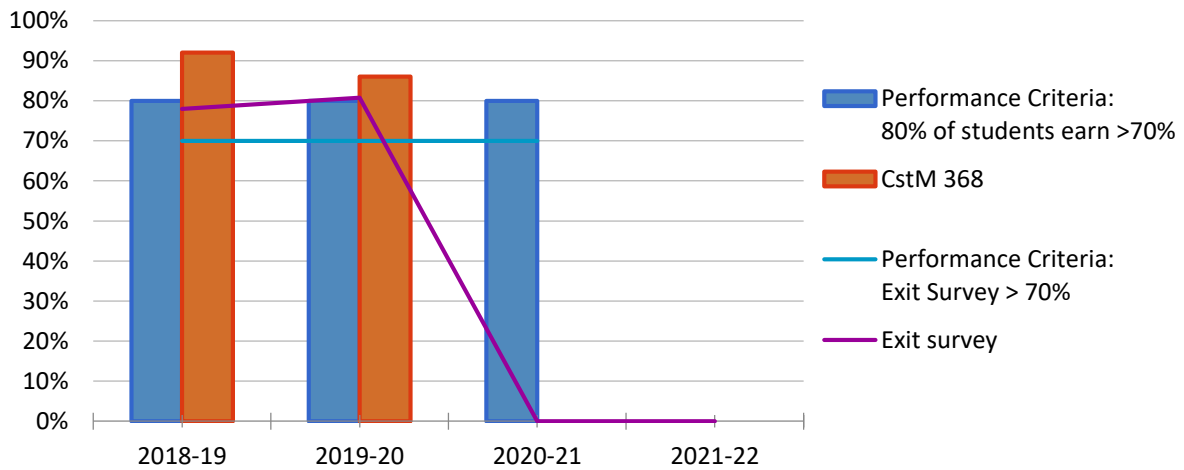




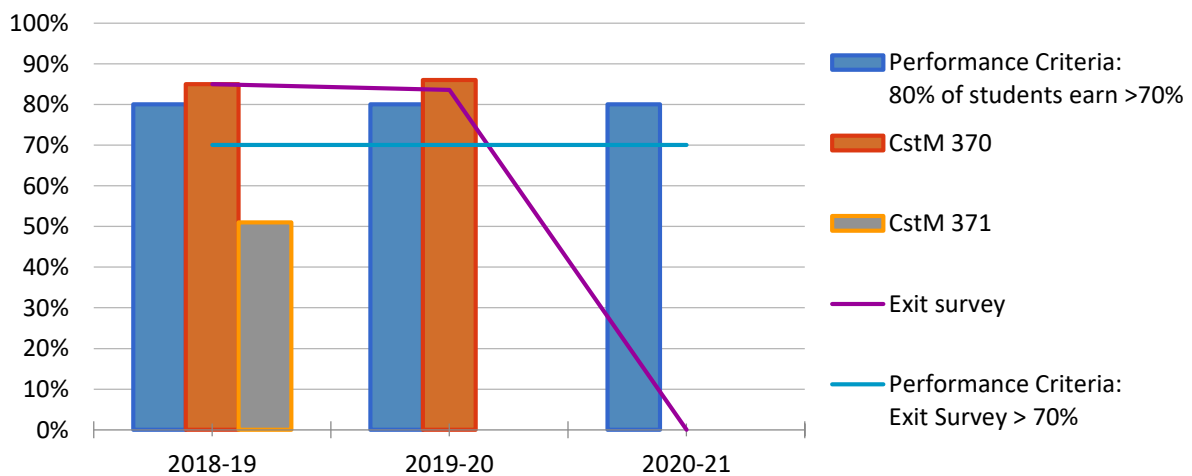
# Washington State University Construction Management

## Academic Quality Improvement Plan for Bachelor of Science in Construction Management

### SLO #3: Create a construction project safety plan



### SLO #4: Create construction project cost estimates

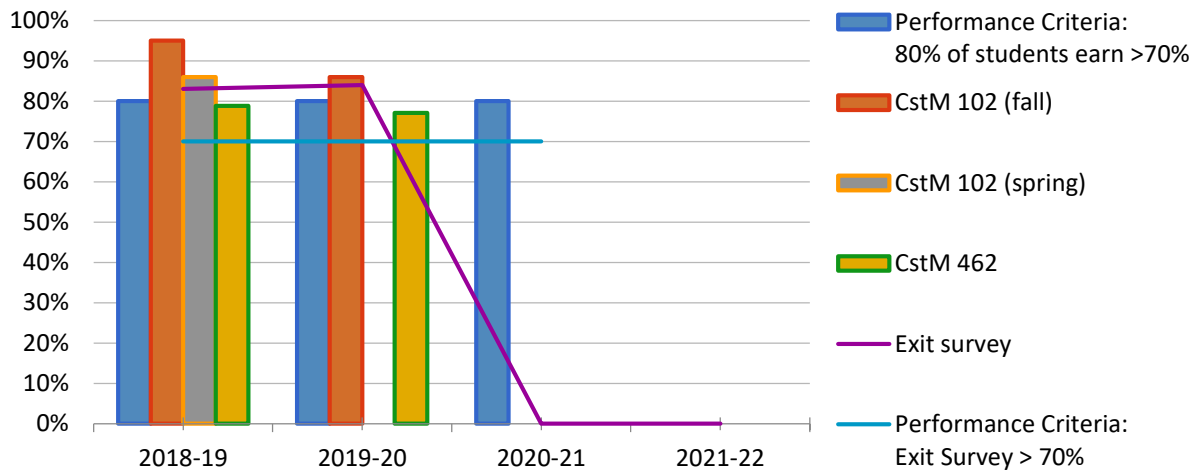




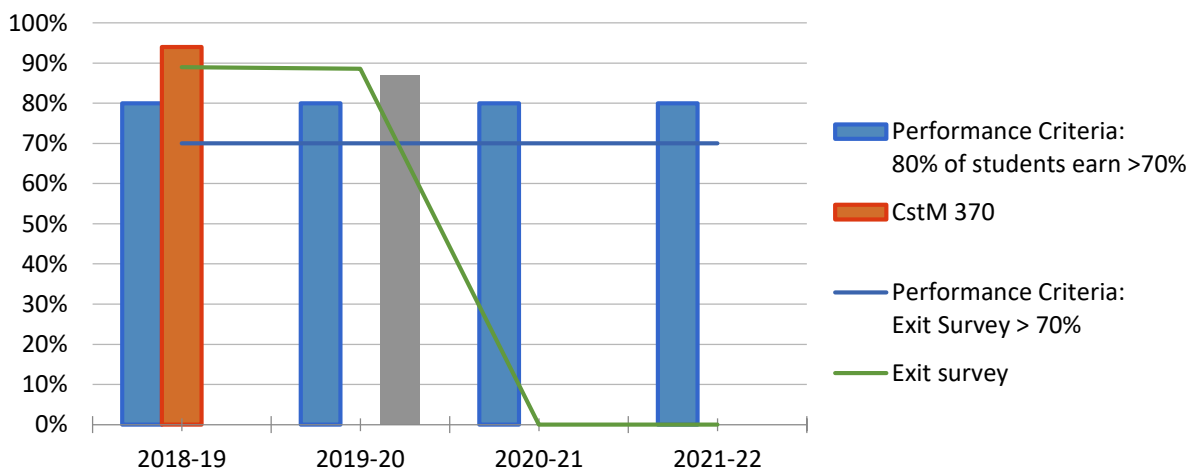
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## Academic Quality Improvement Plan for Bachelor of Science in Construction Management

### SLO #5: Create construction project schedules



### SLO #6: Analyze professional decisions based on ethical principles

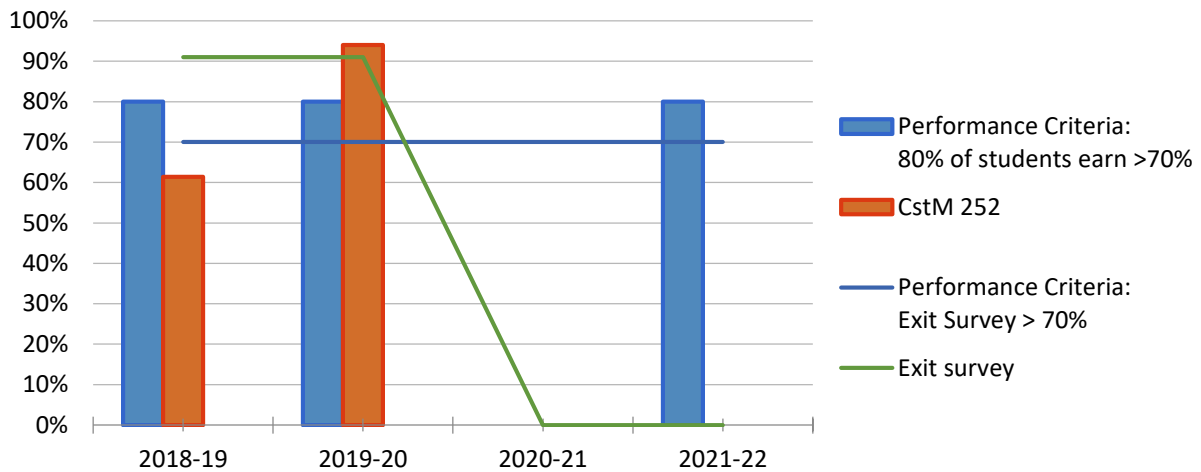




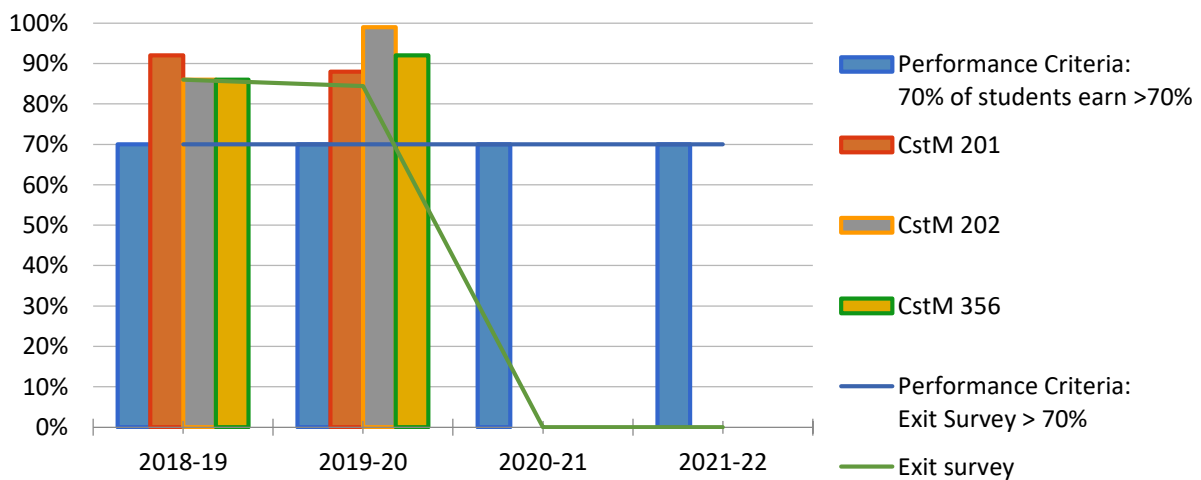
# Washington State University Construction Management

## Academic Quality Improvement Plan for Bachelor of Science in Construction Management

### SLO #7: Analyze construction documents for planning and management of construction process



### SLO #8: Analyze methods, materials, and equipment used to construct projects

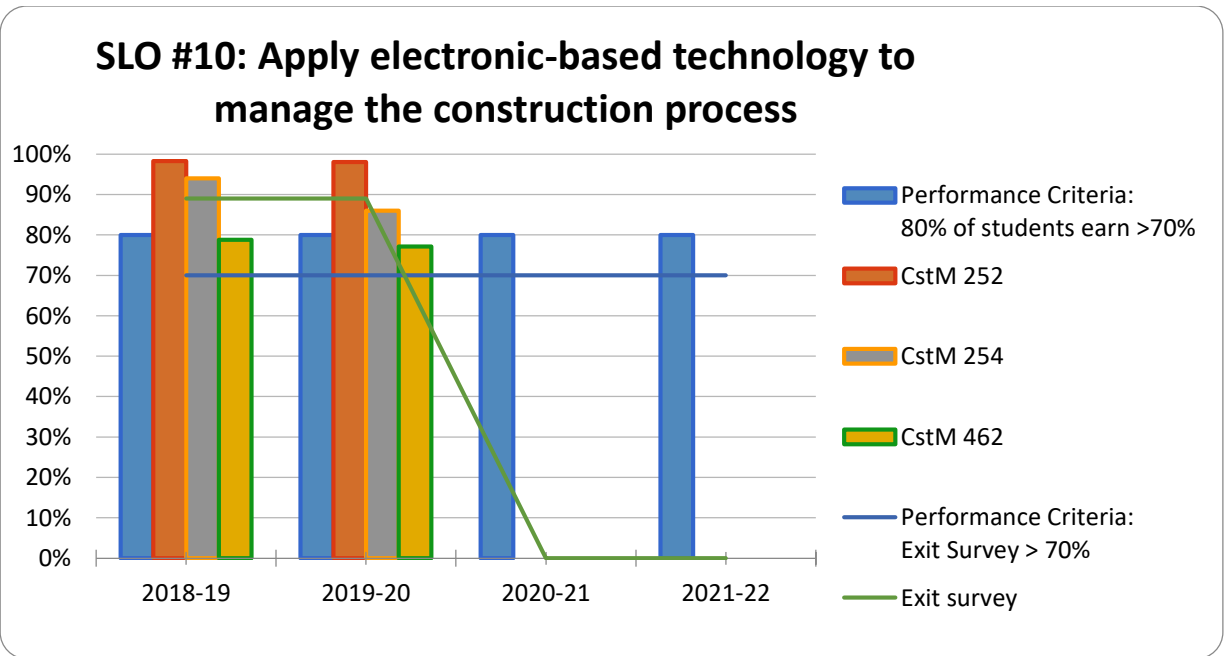
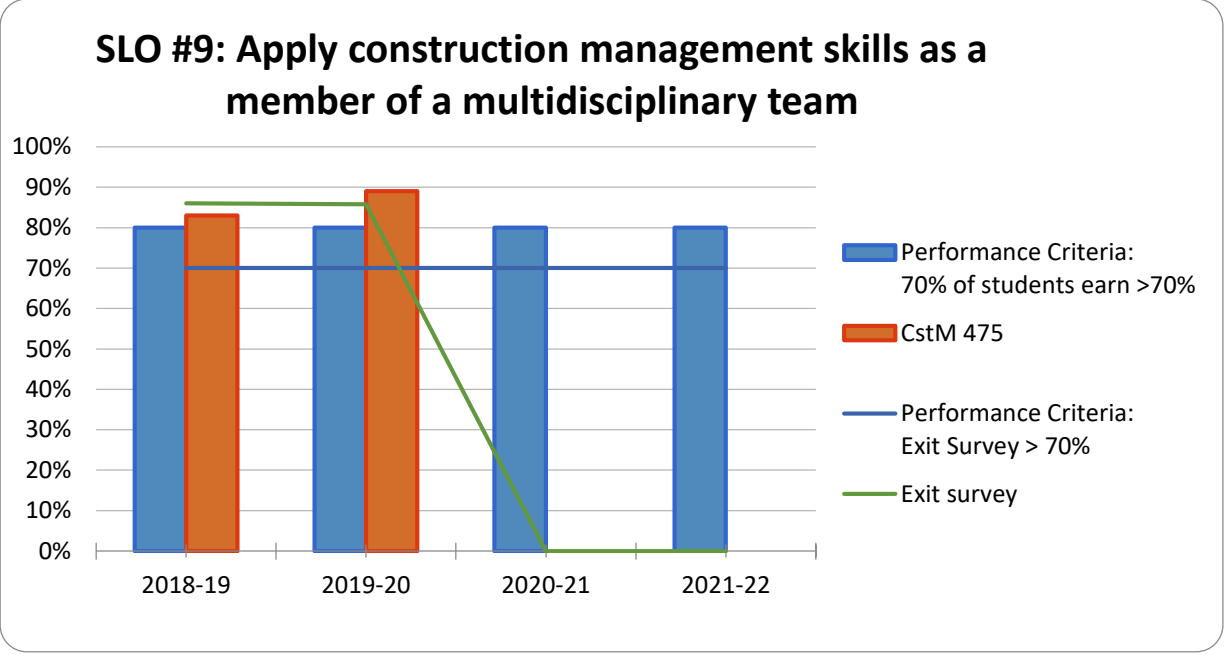






# Washington State University Construction Management

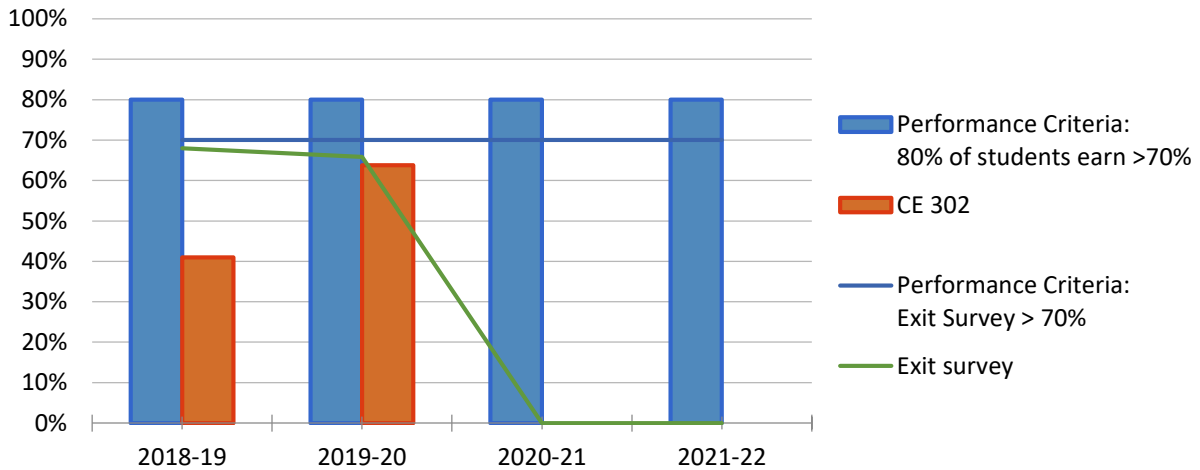
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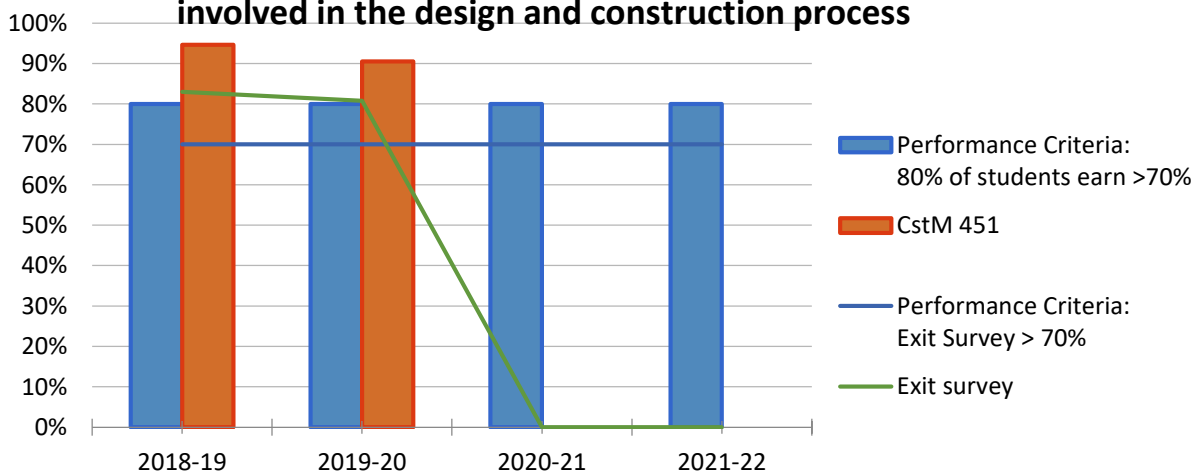


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## SLO #11: Apply basic surveying techniques for construction layout and control



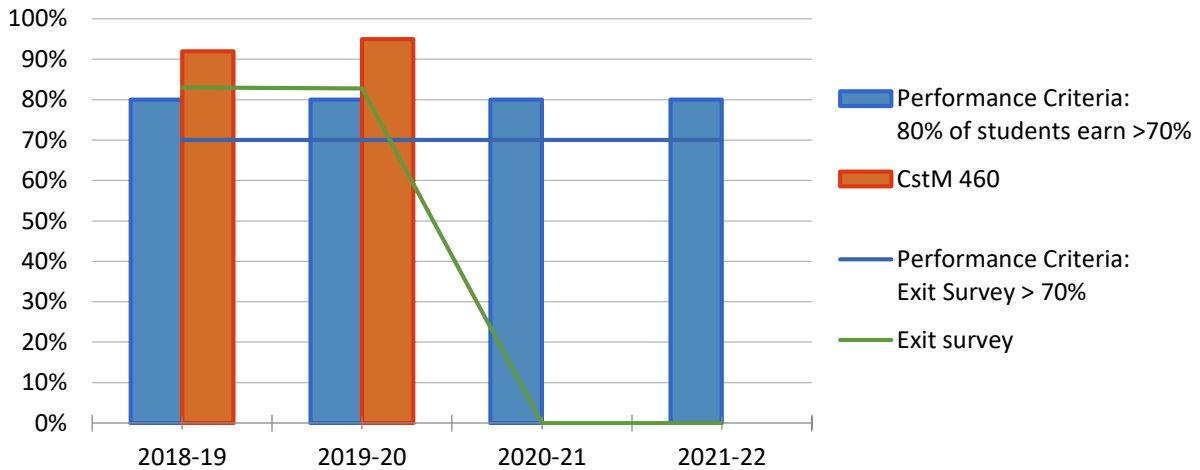
## SLO #12: Understand different methods of project delivery and the roles and responsibilities of all constituencies involved in the design and construction process



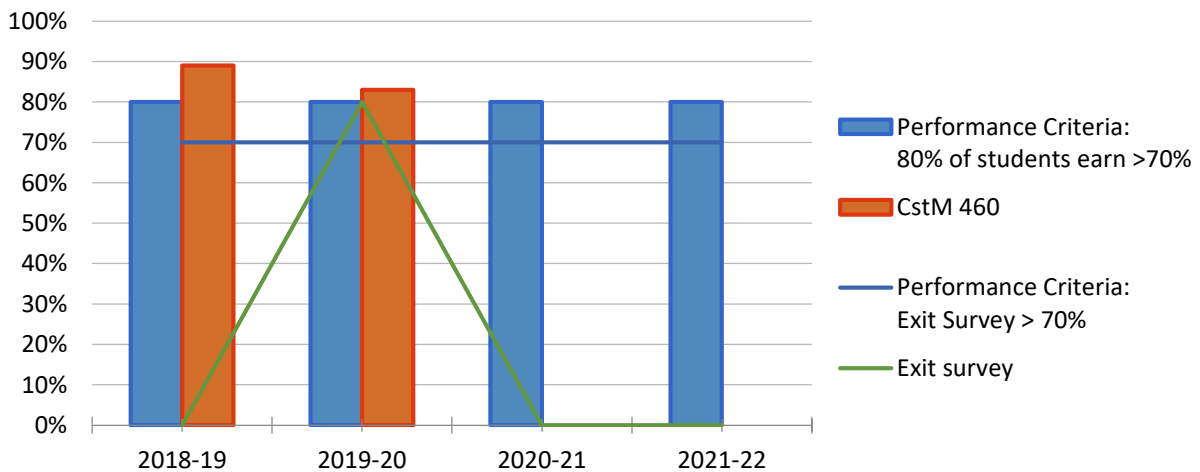


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## SLO #13: Understand construction risk management



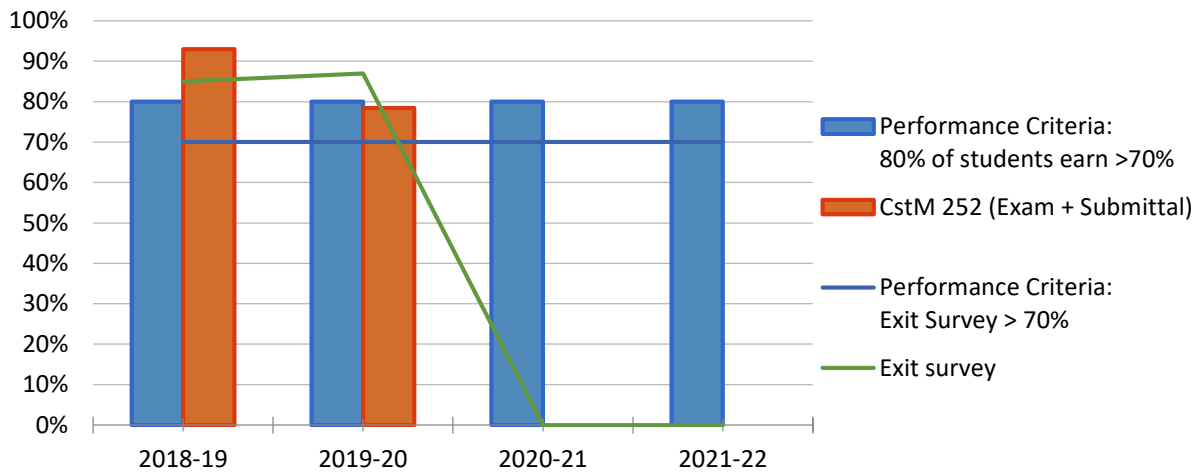
## SLO #14: Understand construction accounting and cost control



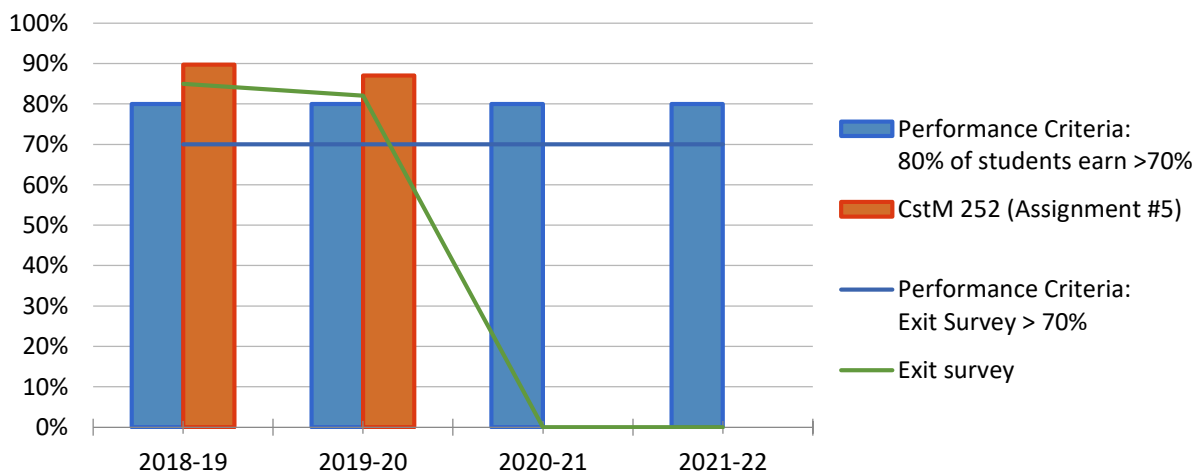


# Washington State University Construction Management Academic Quality Improvement Plan for Bachelor of Science in Construction Management

## SLO #15: Understand construction quality assurance and control

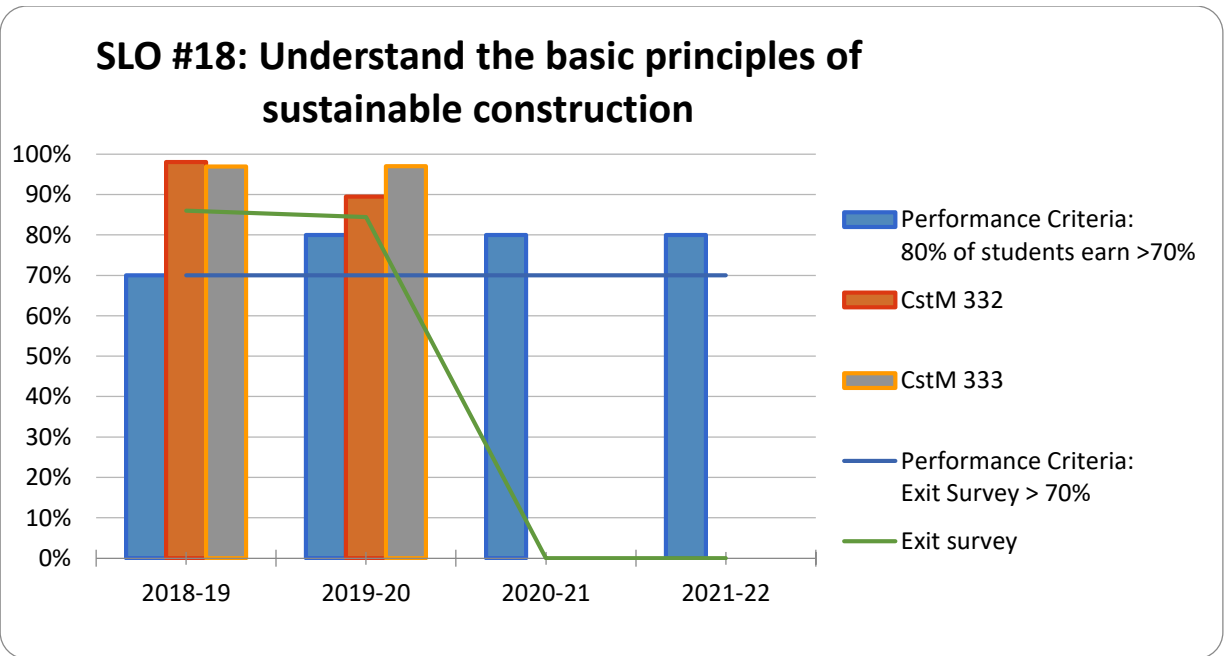
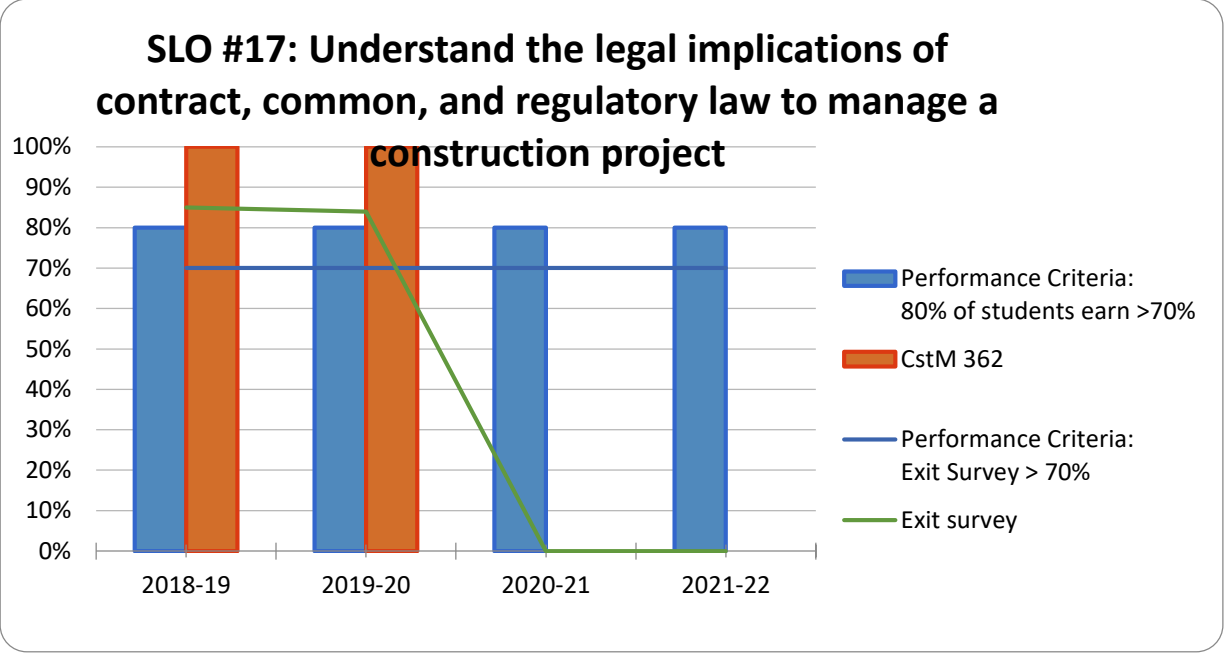


## SLO #16: Understand construction project control processes





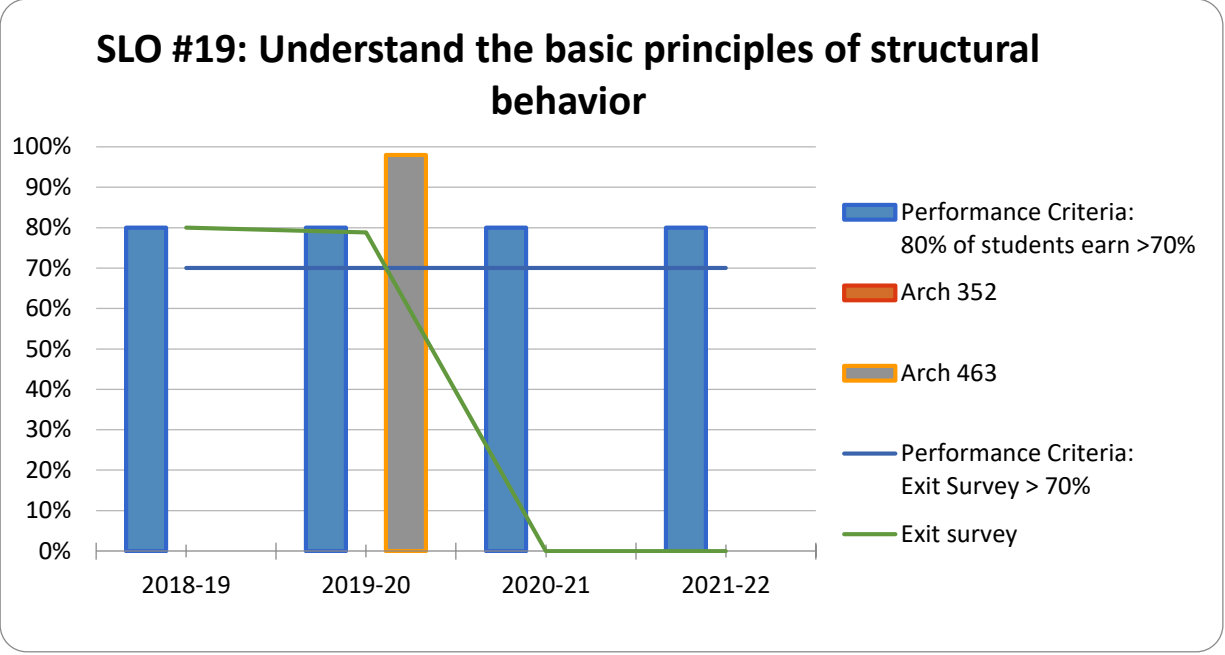
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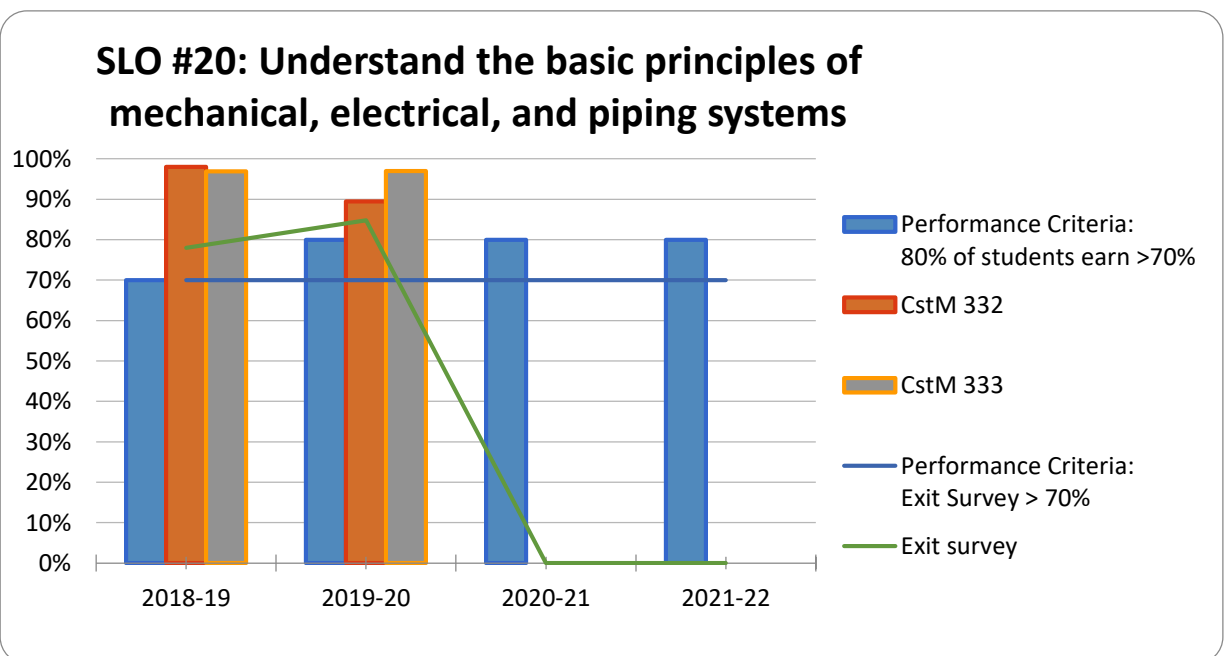


# Washington State University Construction Management

## Academic Quality Improvement Plan for Bachelor of Science in Construction Management



**NOTE:** Due to coordination issues with an adjunct faculty member for this course, SLO #18 was not assessed in Arch 352. A semi-permanent faculty member will be teaching the course in the 2019 - 2020 academic year and assessment data will be obtained.

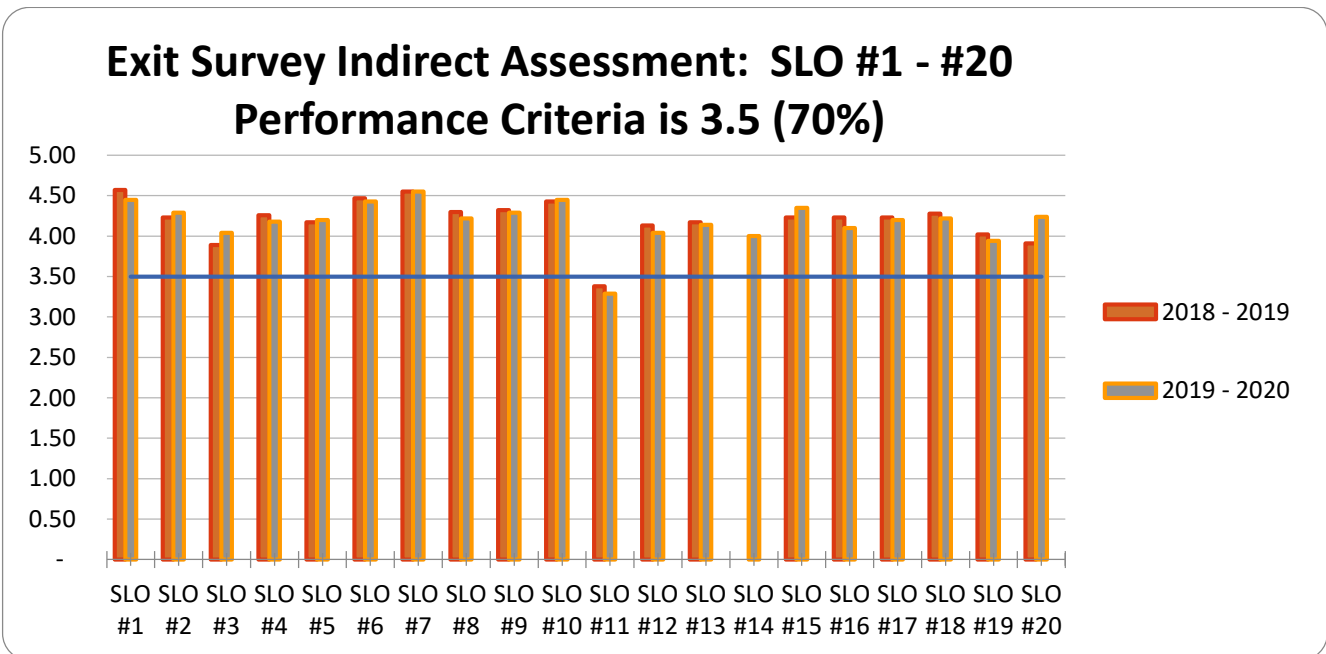




# Washington State University Construction Management Academic Quality Improvement Plan for Bachelor of Science in Construction Management

## Appendix B Detailed Indirect Assessment Data Senior Exit Survey

As an indirect assessment tool, this survey is designed to determine graduating senior’s opinion on how well they accomplished the SLO. Below is a historical (and graphical) representation of the Senior Exit Survey results as it relates to the questions used for this Detailed Indirect Assessment Tool.



**NOTE:** Due to an error on the 2019 Senior Exit Survey, question #14 regarding SLO #14 was not included. This error has been corrected (see below) and data was obtained for the 2019 - 2020 academic year.



# Washington State University

## Construction Management

### Academic Quality Improvement Plan for Bachelor of Science in Construction Management

Page | 24

The information below identifies the scale and the questions used for this indirect assessment tool.

*On a scale of 1 to 5, please rate your level of agreement with each of the 21 statements below as to how well the CM program prepared you with the necessary knowledge and skill. Select the most appropriate rating/number for each statement (with 1 = strongly disagree, 2 = disagree, 3 = mixed feelings, 4 = agree, and 5 = strongly agree):*

- 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 accurately estimate and price work to create a construction project estimates.*
- 5. I am able to create a construction project schedule using CPM and computer/software.*
- 6. I am able to analyze professional decisions based on ethical principles.*
- 7. I am able to analyze (read & interpret) construction documents for the 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 an effective member of a multi-disciplinary team.*
- 10. I am able to apply electronic-based technology to manage the construction process (e.g., Procore, Bluebeam, etc.).*
- 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 (parties) 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 plumbing systems.*
- 21. The CM program of study was very good preparation for my career.*





# Washington State University

## Construction Management

### Academic Quality Improvement Plan for Bachelor of Science in Construction Management

#### Appendix B.1

##### Other Senior Exit Survey + Senior Exit Interview Findings

The findings below are a compilation of feedback provided by the seniors via the Senior Exit Survey (SES). Due to the transition to online/remote learning as a result of COVID-19, the program coordinator was unable to meet with the senior class in person (or remotely) to discuss what parts of the CM program they liked and what could be improved. It is anticipated that the program coordinator will be able to facilitate this meeting in the spring 2021 semester. The following is a summarized compilation of feedback from the seniors:

WSU CM students are generally pleased with the courses and instruction offered and as would be expected, the students provided feedback and suggestions for improvement for future students.

#### 1. Miscellaneous items

- a. More space for students to work outside of class + having faculty located in Carpenter Hall.
- b. Desire for more engagement/application within courses...learn more via project based learning
- c. More field trips...coordinated with classes if possible
- d. Tie info sessions to guest lectures, etc. to increase attendance
- e. More work with Revit...forget a lot from 2<sup>nd</sup> year + more BIM (Assemble, etc.)
- f. Better access to printing services.
- g. Emphasized importance of student competitions
- h. Internships...should get course credit - required or elective



# Washington State University

## Construction Management

### Academic Quality Improvement Plan for Bachelor of Science in Construction Management

Page | 26

#### Appendix C Faculty Observations & Recommendations Report

The CM faculty met on October 20, 2020 (delayed due to COVID-19) for a faculty meeting/retreat focused primarily on observations and recommendations associated with the prior year's (2019-2020 academic year) direct and indirect assessment results. In this meeting, each SLO and their respective assessment tool/item, performance criteria, and student performance was discussed. While this was a lengthy process the result was a robust discussion coupled with an honest reflection of both student and faculty performance. The following summarizes the observations and recommendations for each SLO (via direct assessment):

*SLO #1 - Create written communications appropriate to the construction discipline.*

CstM 252 - Construction Administration & Documentation. Tool(s) used for assessment is appropriate however, student performance is likely higher than realistic. Instructor noted that grading is not tough enough due to time constraints and insufficient TA support in order to provide proper feedback in a timely manner.

*SLO #2 - Create oral presentations appropriate to the construction discipline.*

CstM 475 - Senior Capstone. The tool(s) used for assessment is appropriate and the results are satisfactory. No changes at this time.

*SLO #3 - Create a construction project safety plan.*

CstM 368 - Safety & Health. The tool(s) used for assessment have been modified to better reflect the assessment of a project safety plan. The results are satisfactory. No other changes at this time.

*SLO #4 - Create construction project cost estimates.*

CstM 370 - Estimating I. The tool(s) used for assessment are appropriate and the grading rubric has been revised to better reflect student ability to create an estimate. The results are satisfactory. No other changes at this time.

CstM 371 - Estimating II. The tool(s) used for assessment are appropriate after changes were made to the exam allowing the students enough time to complete the work. However, due to the abrupt change to online/remote education and the use of Blackboard LMS for the exam issues remain. The grading schema within the LMS allows for limited flexibility with correct or partially correct answers thereby having a negative impact on actual results. The exam will be modified for the next course offering.

*SLO #5 - Create a construction project schedule.*

CstM 462 - Planning & Scheduling. The tool(s) used for assessment are appropriate and the results are satisfactory. No changes at this time.

*SLO #6 - Analyze professional decisions based on ethical principles.*

CstM 473 - Human Productivity. The tool(s) used for assessment are appropriate and the results are satisfactory. No changes at this time.



# Washington State University

## Construction Management

### Academic Quality Improvement Plan for Bachelor of Science in Construction Management

Page | 27

*SLO #7 - Analyze construction documents for the planning and management of construction processes.*

CstM 252 - Construction Administration & Documentation. The tool(s) used for assessment are appropriate and the results are satisfactory. The exam (lab final) was modified to be a two-part exam resulting in a better assessment of student knowledge. No changes at this time.

*SLO #8 - Analyze methods, materials, and equipment used to construct projects.*

CstM 201 - Materials I. The tool(s) used for assessment are appropriate and the results are satisfactory. No changes at this time.

CstM 202 - Materials II. The tool(s) used for assessment are appropriate and the results are satisfactory. No changes at this time.

CstM 356 - Earthwork & Equipment. The tool(s) used for assessment are appropriate and the results are satisfactory. No changes at this time.

*SLO #9 - Apply construction management skills as an effective member of a multi-disciplinary team.*

CstM 475 - Senior Capstone. The tool(s) used for assessment are appropriate and the results are satisfactory. Additional tools were added relative to meeting evaluations and peer evaluations. No changes at this time.

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

CstM 252 - Construction Administration & Documentation. The tool(s) used for assessment are of concern as they are basically "pass/fail" in nature via Procore. Further discussion bore out that this course is not a good fit for evaluation this SLO. It was determined that this SLO will no longer be assessed in this course.

CstM 254 - Construction Graphics. The tool(s) used for assessment are appropriate and the results are satisfactory. No changes at this time.

CstM 462 - Planning & Scheduling. The tool(s) used for assessment are appropriate and the faculty member is incorporating more hands-on with P6 and industry folks as a resource in the class via guest lectures, etc. to enhance the use of the software. The tool(s) used for assessment are appropriate and the results are satisfactory. No changes at this time.

*SLO #11 - Apply basic surveying techniques for construction layout and control.*

CE 302 - Surveying. Results are concerning and assessment tool(s) may not be appropriate considering the number of group/team assignments which is a result of the large class size. Instructor is incorporating at least one (1) new assessment tool for the next course offering. We will continue to monitor the student performance.

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

CstM 451 - Delivery Systems. The tool(s) used for assessment tools are appropriate and the results are satisfactory. The course has been "revamped" to omit DBIA core curriculum resulting in modified assessment tools. No changes at this time.



# Washington State University

## Construction Management

### Academic Quality Improvement Plan for Bachelor of Science in Construction Management

Page | 28

*SLO #13 - Understand construction risk management.*

CstM 460 - Construction Cost Management. The tool(s) used for assessment are appropriate and the results are satisfactory. It was discussed that there is a need to add some construction risk items to the Safety & Health for spring 2021 as an additional assessment tool thereby providing a diverse approach to risk management.

*SLO #14 - Understand construction accounting and cost control.*

CstM 460 - Construction Cost Management. The tool(s) used for assessment are appropriate and the results are satisfactory. No changes at this time.

*SLO #15 - Understand construction quality assurance and control.*

CstM 252 - Construction Administration & Documentation. The tool(s) used for assessment are appropriate. Instructor added additional course content and assessment tools. It was discussed that it would be more appropriate to assess this content in the CstM 201 - Materials I course. This change will be implemented starting fall 2021.

*SLO #16 - Understand construction project control processes.*

CstM 252 - Construction Administration & Documentation. The tool(s) used for assessment are appropriate and results are satisfactory. No change needed at this time.

CstM 460 - Construction Cost Management. The tool(s) used for assessment are appropriate and the results are satisfactory. No changes at this time.

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

CstM 362 - Construction Law. The tool(s) used for assessment are appropriate however, the results (100%) are of concern. With two (2) data points there is now justification to make changes. We will work with the instructor of this course to adjust assessment tool. Discussions with the instructor determined that the inclusion of the writing assignments (used for the writing in the major requirement) may be inadvertently buoying the results. Moving forward, the assessment will focus solely on the three exams in the course.

*SLO #18 - Understand the basic principles of sustainable construction.*

CstM 332 - Building Science I. The tool(s) used for assessment are appropriate and the results are satisfactory. The performance criteria were changed to 80% of students earn a C or better in lieu of 70%. No changes at this time.

CstM 333 - Building Science II. The tool(s) used for assessment are appropriate and the results are satisfactory. The performance criteria were changed to 80% of students earn a C or better in lieu of 70%. No changes at this time.

*SLO #19 - Understand the basic principles of structural behavior.*

Arch 352 - Structures II. This SLO was not assessed due to coordination issues with an adjunct faculty member. A new, semi-permanent faculty member has been hired to teach this course and it will be assessed in the 2019-2020 academic year.

Arch 463 - Structures III. The tool(s) used for assessment are appropriate and the results are satisfactory. No changes at this time.



# Washington State University

## Construction Management

### Academic Quality Improvement Plan for Bachelor of Science in Construction Management

Page | 29

*SLO #20 - Understand the basic principles of mechanical, electrical and plumbing systems.*

CstM 332 - Building Science I. The tool(s) used for assessment are appropriate and the results are satisfactory. The tool(s) used for assessment are appropriate and the results are satisfactory. The performance criteria were changed to 80% of students earn a C or better in lieu of 70%. No changes at this time.

CstM 333 - Building Science II. The tool(s) used for assessment are appropriate and the results are satisfactory. The tool(s) used for assessment are appropriate and the results are satisfactory. The performance criteria were changed to 80% of students earn a C or better in lieu of 70%. No changes at this time.

The following summarizes the observations and recommendations for each SLO (via indirect assessment):

The sentiment amongst the faculty relative to the indirect assessment results (via Senior Exit Survey) was generally positive. It was noted that the student's perception of their abilities and or comprehension of concepts was more in line with the direct assessment results this year. A concern noted this year is that the results may not be appropriate as they are taking the Senior Exit Survey, potentially, several semesters after they have taken the course. While that is understandable, it was noted that this type of indirect assessment at the end of the senior year is common. As a way to acquire additional indirect assessment for the next assessment cycle, the program will be conducting a similar survey of our industry partners.

The results were shared with the Construction Management Advisory Board (CMAB) Curriculum Committee on October 10, 2020. The following pages include the meeting minutes and summarizes the observations and recommendations from the Construction Management Advisory Board (CMAB) Curriculum Committee:

The Advisory Board for the Washington State University Construction Management program as assembled from our ranks a group of industry professionals to serve on a curriculum review committee. This committee consists of Dave Harrison (Skanska USA), Todd Williams (Excel Pacific), Marjorie Chang Fuller (Hoffman Construction), Marc Everson (Abbott Construction), and Corey Anderson (Fisher Construction Group). On October 28<sup>th</sup>, 2020 our committee was convened to review the 2019/2020 AQI plan report for the CM program. The discussions covered many, but not all, of the student learning outcomes. If no discussion was had, the course results were generally favorable. The following is a summary of our discussions:

- SLO 1-3 were reviewed and found to have acceptable and consistent ratings when compared to the 2018/2019 results
- SLO 4 'Create construction project cost estimates', in past years had a notably low success rate as compared to the performance criteria in CstM 371. The program head attributes this to the exam being too difficult and too long for the allotted time. Adjustments were made to this final exam and the result increased from 51% to 77% of the students achieving at least 80% of students earn a C (70%) or better. The board will continue to monitor this course with the program to ensure efficacy of this class.
- SLO 6 learning outcome focuses on 'Ethical Principles'. The evaluation criteria were narrowed to CstM 473 which the program feels is a better measurement metric. CstM 473 was not evaluated last year so no year over year comparative data exists yet. With an 87% success on the performance criteria, this SLO is satisfactory this year.



# Washington State University

## Construction Management

### Academic Quality Improvement Plan for Bachelor of Science in Construction Management

Page | 30

- SLO 7 'measures the student's ability to analyze construction documents for planning and management of construction processes'. Success of the performance criteria jumped from 61% to 94%. The board views this as tremendous progress. Our program head reports that this increase was achieved by adjustments to the exam and coursework.
- SLO 10 'Apply electronic-based technology to manage the construction process'. CstM 252 was removed as it was deemed not to be a good representation of this SLO. The evaluated coursework was narrowed to CstM 254 and 460 which offer construction graphics and scheduling coursework within industry recognized software. The professor of the scheduling class is reported to have gained more experience with the scheduling software which is expected to increase the learning outcomes next year as outcomes are generally lower here than last year.
- SLO 11 'Apply basic surveying techniques for construction layout and control'. This course was flagged as a concern last year as the students achieving the performance criteria was 41%. This year is improved at 64% but still not as high as the board would like to see it. The head of our program reports that this class is administered by the Civil Engineering program and is geared more towards those students. The faculty in this program have made some changes to accommodate students outside of the CE program. It is also stated that the course requires the use of AutoCAD and Civil 3D software as part of many of the lab work. The CE students have the skillsets to be successful with the software where the CM students do not. Jason Peschel – CM program head stated he would investigate the issue regarding the AutoCAD and Civil 3D use.
- SLO 12-13 were reported to be going well and showing improvement.
- SLO 14 'Understand construction accounting and cost control'. An indirect assessment via the exit survey was not done last year for this class due to an error but was completed this year. The percent of success dipped a bit but is still acceptable.
- SLO 15 'Understand construction quality assurance and control'. This SLO reported a significant decrease in success. The professor reports that he is not too concerned about this dip but will watch it to ensure it is a blip and not a trend.
- SLO 17 'Understand the legal implications of contract, common, and regulatory law to manage a construction project'. CstM 362 reports 100% of the students meeting the performance criteria for the past 2 years. This is a concern to the board as we feel this course may be too easy. The program head will investigate the nature of the coursework and final to see if there is a concern.
- SLO 19 'Understand the basic principles of structural behavior'. No assessment of this SLO was completed last year so this year's data is the only point of reference. The results of this single data point are high at 98%. Coursework reported to potentially include a number of group assignments and group exams. This should not be the case for a Structures III level class. Program head will investigate.

Our review of the above Student Learning Outcomes (SLO) find that most classes have an acceptable or better than acceptable rating percentage. This is good trending with high percent results, many in the 80-90% range. The faculty should keep an eye on the consistently low and consistently high percentages to look for improvement and/or modification opportunities. With 2 years of data now in hand, next year's results will be particularly interesting as the trending can then be established. We are excited to have year over year data in hand as we evaluate the coursework, syllabus outlines, and assessment data in the future.



# Washington State University Construction Management

## Academic Quality Improvement Plan for Bachelor of Science in Construction Management

Page | 31

A discussion of this coursework and syllabus review was had, and it was agreed that a 2-year timeframe was appropriate between reviews. The board also expressed an interest in direct interaction with the accreditation board when they come through next fall if they desire to meet with us.

This committee is very pleased with the efforts of the faculty to create and use this measurement tool, and their commitment to improvement of the program. We are happy to be included as a part of this continuous improvement effort on behalf of the faculty and the University to continue to produce the high-quality student graduates that we, the industry, rely upon.

Authored by: Corey Anderson - Fisher Construction Group

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Dave Harrison - Skanska USA

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