

Boise State University  
Department of Construction Management

2016-2017  
Quality Assessment Report  
and Action Plan

October 9, 2017

## **Executive Summary**

The Construction Management program is accredited by the American Council for Construction Education (ACCE). The most recent visit from that body occurred in the spring of 2013. As laid out in our data collection plan the following Student/Program Learning Outcomes were to be evaluated in the 2016-2017 school year:

1. Create written communications appropriate to the construction discipline.
2. Create oral presentations appropriate to the construction discipline.
6. Analyze professional decisions based on ethical principles.
7. Analyze construction documents for planning and management of construction processes.
9. Apply construction management skills as an effective member of a multi-disciplinary team.
15. Understand construction quality assurance and control.
17. Understand the legal implications of contract, common, and regulatory law to manage a construction project.

To do this four instruments were used:

- American Institute of Constructors Level 1 (Associate Constructor) Exam
- Review of Student Work
- Graduating Senior Exit Survey
- Industry/Employer survey from the fall of 2015

Based on the data collected, all of the Outcomes reviewed this continue to be met. Student perception of their abilities continues to raise some minor concerns. The students continue to demonstrate a level of understanding of the concepts and material that often surpasses their opinions about their own abilities. Efforts continue to be made to reinforce their attitudes about their level of understanding.

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## **PART I – PROGRAM ORGANIZATION**

### Mission

To provide comprehensive educational opportunities, applied research, and service-oriented outreach for the development of future professional constructors who, through innovation, character and ability are prepared to meet the construction needs of society and provide leadership to the construction industry.

### Vision

To be recognized and respected for providing consistent, creative, high quality, student centric education, applied research, and community focused outreach, with a clear emphasis on ethics, sustainability and leadership.

### Student & Program Learning Outcomes

The Student Learning Outcomes and the Program Learning Outcomes are defined as the knowledge and skills we expect our students to possess at the time of graduation.

Upon successful completion of the Construction Management course of study, graduates can be expected to:

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 system.

## Program Objectives

Program Objectives are defined as the abilities we expect our alumni to exhibit three to five years after graduation.

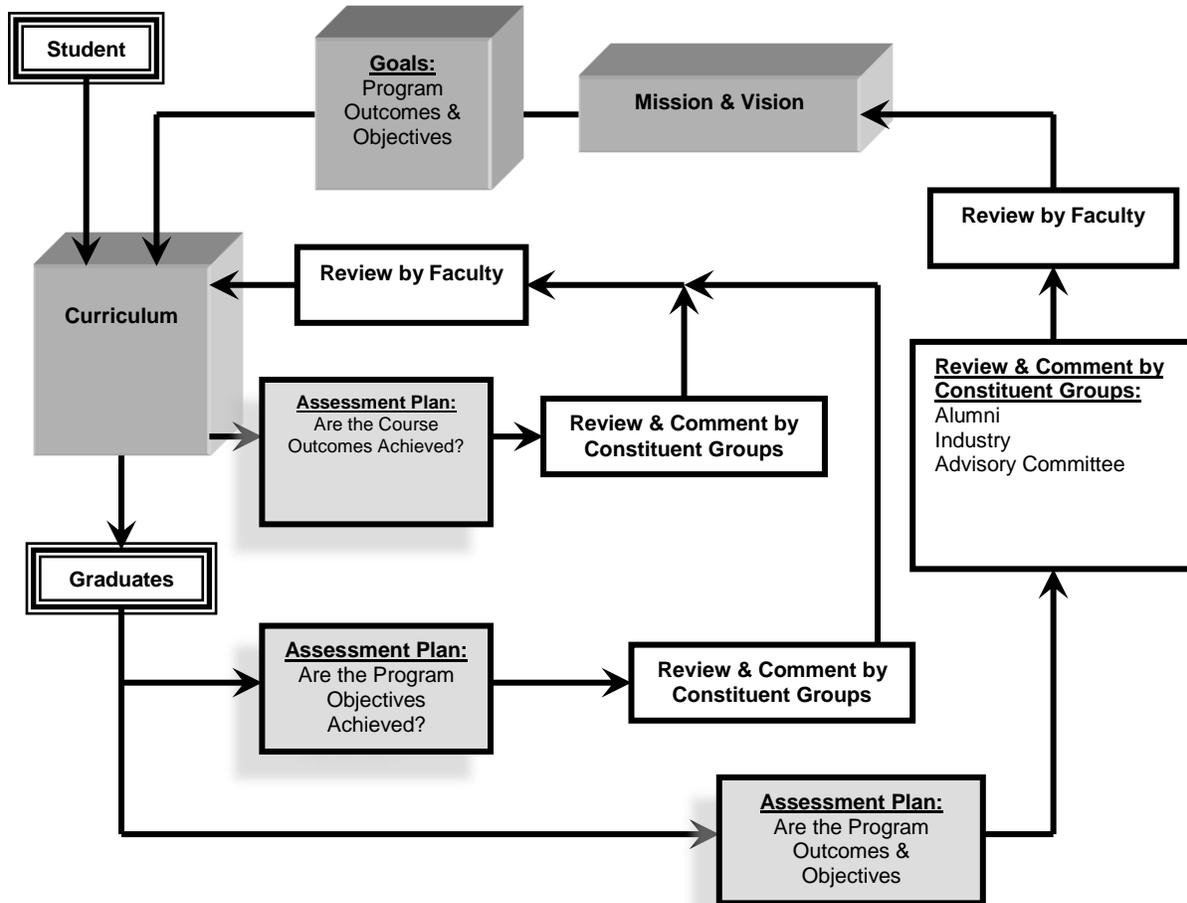
Students who are granted the Bachelor of Science in Construction Management will demonstrate knowledge and understanding in the following areas:

1. **General Education** - Graphic, oral and written communications, and the understanding of human factors.
2. **Math and Science** – Principles of mathematics, statistics and physics in order to appropriately anticipate the behavior of the materials, equipment, and methods used in construction.
3. **Business and Management** – The demands of working in a global environment including: knowledge of sustainability, accounting, finance, business regulations, contract law, labor law, and marketing practices. The fundamentals of contemporary management and business practices appropriate to the construction profession.
4. **Construction Science** – The contribution of other professional disciplines to the construction process. The ability to lead, coordinate, communicate and interact with professionals in various disciplines to solve project challenges.
5. **Construction** – The total project process including: concept, design, procurement, construction, and delivery of the functioning project. The constructor's professional responsibility as a leader and member of a multi-disciplinary team, working in diverse environments, assessing risks, and showing definitive progress, all while maintaining priorities in safety, sustainability, purpose, business, and societal issues.
6. **Life-Long Learning** – An appreciation of the need for, and the value of, leadership, collaboration, productivity, and professionalism in sustaining or developing one's own career growth.

## Program Quality Assessment

The Construction Management department has an established process of assessment and improvement, as depicted in the figure below.

Each course offered by the department has established a series of Course Outcomes that are measurable learning outcomes specific to each course. Course Outcomes must support the Program Outcomes and Objectives. In turn, the Program Outcomes and Objectives must support the Mission and Vision of the program.



**Figure 1 – Program Assessment Process**

Performance of our current students and graduates is measured in a number of ways, including:

- results of the comprehensive American Institute of Constructors (AIC) Exam;
- review of student work;
- graduating senior exit survey;
- alumni and industry surveys; and
- input from the program’s industry advisory board.

This assessment information is compared to our desired performance, which is articulated in the Program Outcomes and Objectives. Any gap or discrepancy between our actual and desired performance indicates that a modification is needed, either within the curriculum, or to the Program Outcomes or Objectives. This process is driven by program faculty both directly (through day-to-day involvement with course design, delivery, assessment, and evaluation), and indirectly (through the influence of service and research).

Assessment of Student/Program Learning Outcomes

The table below lists our planned assessment methods for each Student/Program Learning Outcome listed previously (page 1).

*Table 1 – Student/Program Learning Outcomes Assessment Plan*

<b>Assessment Measure:</b>	<b>Outcomes Addressed: (list by number)</b>	<b>How is the information used</b>	<b>Timeline</b>
<p><b>American Institute of Constructors Level 1 (Associate Constructor) Exam</b> This comprehensive exam, which covers all aspects of construction project management, is required to be taken and passed with a score of 70% or better by all students in our program.</p>	6, 7, 8, 12, 13, 14, 15, 16, 17, 18, 19, & 20	Scores are an assessment of student learning in the test subject areas in comparison to national averages. Scores equal to or higher than national averages indicate the learning goals are being achieved. Scores below the national averages or indicating a weakness lead to a faculty review of the curriculum to identify classes where course content can be revised to address the weakness.	Twice per year (November and April)
<p><b>Review of Student Work</b> This is a review of student performance on tests and assignments relative to the stated learning objectives for every CMGT course. This is an ongoing assessment.</p>	All	Faculty review student performance on selected assignments, projects or exams to measure whether the program outcomes are being achieved and at what level. Faculty address weaknesses by revising content or course objectives as appropriate.	The 20 Program Outcomes are reviewed on a 3-year cycle
<p><b>Graduating Senior Exit Survey</b> These questionnaires are designed to evaluate the level at which graduating seniors believe they have achieved the CM Program Outcomes.</p>	All	Faculty review questionnaires completed by graduating students to identify areas in the curriculum which the students feel are not being addressed to their satisfaction. Faculty address weaknesses by revising course objectives or content as appropriate.	At the end of every semester
<p><b>Industry/Employer Surveys</b> These questionnaires are designed to evaluate the relevance and achievement of CM Program Outcomes with respect to current industry requirements.</p>	All	Faculty review questionnaires completed by Industry and Employers to identify areas in the curriculum which members of industry feel are not being adequately taught based on graduate knowledge and job performance. If the Respondent does not employ Boise State CM grads, they may provide feedback about the relevance of the Program Outcomes. Faculty address weaknesses by revising program outcomes, or course objectives or content as appropriate.	Every three years.  Last conducted – Fall 2015  Next survey - Fall 2018

Assessment of Program Objectives

The table below lists our planned assessment methods for each Program Objectives listed previously (page 2).

*Table 2 - Program Objectives Assessment Plan*

<b>Assessment Measure:</b>	<b>Objectives Addressed: (list by number)</b>	<b>How is the information used</b>	<b>Timeline</b>
<p><b>Alumni Surveys</b> These questionnaires are designed to evaluate the achievement of CM Program Objectives (at 3 to 5 years post-graduation).</p>	<p>All</p>	<p>Faculty review questionnaires completed by alumni to identify areas in which the graduates, upon exposure to industry requirements, feel did not adequately prepare them for employment. Faculty address weaknesses by revising course objectives or content as appropriate.</p>	<p>Every three years.  Last conducted – Fall 2014  Next survey - Fall 2017</p>

## **PART II – DATA AND ANALYSIS FOR THE 2016-17 SCHOOL YEAR**

During the most recent assessment cycle the following Program Learning Outcomes were to be assessed.

1. Create written communications appropriate to the construction discipline.
2. Create oral presentations appropriate to the construction discipline.
6. Analyze professional decisions based on ethical principles.
7. Analyze construction documents for planning and management of construction processes.
9. Apply construction management skills as an effective member of a multi-disciplinary team.
15. Understand construction quality assurance and control.
17. Understand the legal implications of contract, common, and regulatory law to manage a construction project.

In order to do that data was collected using the following instruments:

- American Institute of Constructors Level 1 (Associate Constructor) Exam
- Review of Student Work
- Graduating Senior Exit Survey
- Industry/Employer survey from the fall of 2015

The following sections provide a summary presentation and analysis of data collected during the most recent assessment cycle, first by Outcome then by instrument.

**Student/Program Learning Outcome 1**

*“Create written communications appropriate to the construction discipline.”*

Summary

This Outcome is to be achieved at level 6 – Create.

**Direct Measurements:**

**Student Work** (1-Remember, 2-Understand, 3-Apply, 4-Analyze, 5-Evaluate, 6-Create)

Course	Level of Achievement (1 - 6)	Achievement of Outcome (Y/N)
CMGT 374 – Construction Operations & Improvement	6	Y
CMGT 385 – Construction Contracts & Law	6	Y
CMGT 475 – Construction Project Management	6	Y

**Indirect Measurements:**

**Senior Exit Survey** (1 to 5, 5 high)

Question	Fall 2016 n = 13		Spring 2017 n = 19	
	Importance	Achievement	Importance	Achievement
Create written communications appropriate to the construction discipline.	4.69	4.15	4.58	4.16

**Industry/Employer Survey** (1 to 5, 5 high)

Question	Fall 2015 n = 9
Do you feel that Boise State Construction Management Graduates have the ability to create written communications appropriate to the construction discipline?	4.11

The data collected indicates that this Outcome is being met. It is understood by the students that this is an important aspect of their careers. The size of the gap illustrated in the Senior Exit Survey conducted both semesters suggests that the students would like more coverage on this topic. Our Industry/Employer survey also indicates that our students and graduates are doing well in this area.

The discrepancy between the perceived importance and the perceived achievement in the area was discussed by the faculty, and efforts are being made to address the student’s concerns.

**Student/Program Learning Outcome 2**

*“Create oral presentations appropriate to the construction discipline.”*

Summary

This Outcome is to be achieved at level 6 – Create.

**Direct Measurements:**

**Student Work** (1-Remember, 2-Understand, 3-Apply, 4-Analyze, 5-Evaluate, 6-Create)

<b>Course</b>	<b>Level of Achievement (1 - 6)</b>	<b>Achievement of Outcome (Y/N)</b>
CMGT 374 – Construction Operations & Improvement	6	Y
CMGT 475 – Construction Project Management	6	Y

**Indirect Measurements:**

**Senior Exit Survey** (1 to 5, 5 high)

<b>Question</b>	<b>Fall 2016 n = 13</b>		<b>Spring 2017 n = 19</b>	
	<b>Importance</b>	<b>Achievement</b>	<b>Importance</b>	<b>Achievement</b>
Create oral presentations appropriate to the construction discipline.	4.31	4.23	4.32	4.00

**Industry/Employer Survey** (1 to 5, 5 high)

<b>Question</b>	<b>Fall 2015 n = 9</b>
Do you feel that Boise State Construction Management Graduates have the ability to create written communications appropriate to the construction discipline?	4.11

The data collected for this Outcome indicates that it is being met. Our students gain a significant appreciation for oral communications through the ASC competitions each February, as well as through work activities during internships and summer employment. They understand this Outcome and strive to achieve it.

## Student/Program Learning Outcome 6

*“Analyze professional decisions based on ethical principles.”*

### Summary

This Outcome is to be achieved at level 4 – Analyze.

#### **Direct Measurements:**

**Student Work** (1-Remember, 2-Understand, 3-Apply, 4-Analyze, 5-Evaluate, 6-Create)

Course	Level of Achievement (1 - 6)	Achievement of Outcome (Y/N)
CMGT 385 – Construction Contracts & Law	6	Y
CMGT 475 – Construction Project Management	6	Y
<b>AIC Exam by Outcome</b> (Average BSU Score)		
	Fall 2016	Spring 2017
6. Analyze professional decisions based on ethical principles.	80%	79.7%

#### **Indirect Measurements:**

**Senior Exit Survey** (1 to 5, 5 high)

Question	Fall 2016 n = 13		Spring 2017 n = 19	
	Importance	Achievement	Importance	Achievement
Analyze professional decisions based on ethical principles.	4.62	4.00	3.84	4.21

**Industry/Employer Survey** (1 to 5, 5 high)

Question	Fall 2015 n = 9
Do you feel that Boise State Construction Management Graduates have the ability to analyze professional decisions based on ethical principles?	4.30

Data collected from each of the tools used to review this Outcome agree that the Outcome is being met. The interesting data comes from the Senior Exit Survey where students in the fall felt that they had not achieved this Outcome anywhere close to the level they felt it should be achieved. Whereas the students in the spring not only felt they had achieved this Outcome to a greater extent than its' importance merited, but this Outcome was significantly less important than what the fall graduates felt.

Ethics is a very important concept that flows through most, if not all of our coursework. The students do understand that this is both serious and significant. The greater concern for the program is the drop of almost 0.8 points (out of 5) in the student perception of importance of this Outcome.

### Student/Program Learning Outcome 7

*“Analyze construction documents for planning and management of construction processes.”*

#### Summary

This Outcome is to be achieved at level 4 – Analyze.

#### **Direct Measurements:**

**Student Work** (1-Remember, 2-Understand, 3-Apply, 4-Analyze, 5-Evaluate, 6-Create)

Course	Level of Achievement (1 - 6)	Achievement of Outcome (Y/N)
CMGT 385 – Construction Contracts & Law	6	Y
CMGT 417 – Project Scheduling	4	Y
<b>AIC Exam by Outcome (Average BSU Score)</b>		
	Fall 2016	Spring 2017
7. Analyze construction documents for planning and management of construction processes.	76%	78.7%

#### **Indirect Measurements:**

**Senior Exit Survey** (1 to 5, 5 high)

Question	Fall 2016 n = 13		Spring 2017 n = 19	
	Importance	Achievement	Importance	Achievement
Analyze construction documents for planning and management of construction processes.	4.62	3.92	4.58	4.26

**Industry/Employer Survey** (1 to 5, 5 high)

Question	Fall 2015 n = 9
Do you feel that Boise State Construction Management Graduates have the ability to analyze construction documents for planning and management of construction processes?	3.80

Data collected from all of the instruments used indicate that this Outcome continues to be met. There is some concern about student perception of achievement of this Outcome, especially based upon the fall exit survey. The students at that time felt that there was a significant gap between how important this Outcome is, and how well they were able to achieve it. A smaller, but still significant gap appears in the spring, which leads to the conclusion that more work needs to be done to assure the students of their understanding of this Outcome.

**Student/Program Learning Outcome 9**

*“Apply construction management skills as an effective member of a multi-disciplinary team.”*

Summary

This Outcome is to be achieved at level 3 – Apply.

**Direct Measurements:**

**Student Work** (1-Remember, 2-Understand, 3-Apply, 4-Analyze, 5-Evaluate, 6-Create)

Course	Level of Achievement (1 - 6)	Achievement of Outcome (Y/N)
CMGT 475 – Construction Project Management	6	Y

**Indirect Measurements:**

**Senior Exit Survey** (1 to 5, 5 high)

Question	Fall 2016 n = 13		Spring 2017 n = 19	
	Importance	Achievement	Importance	Achievement
Apply construction management skills as an effective member of a multi-disciplinary team.	4.69	4.15	4.32	4.05

**Industry/Employer Survey** (1 to 5, 5 high)

Question	Fall 2015 n = 9
Do you feel that Boise State Construction Management Graduates have the ability to apply construction management skills as an effective member of a multi-disciplinary team?	4.10

Based upon the data from the various instruments, this Outcome is being met. In the fall of 2016 there exists a significant gap between how important the students feel this Outcome is, and how well they understand it by the time of graduation. This is another Outcome that is reinforced beyond the classroom, with many of our students seeing its’ importance through either the ASC competitions in the spring, or through work related experiences, or both. The faculty have noted this gap by the students, and are in the process of addressing the issue.

In the future, more courses will be used to help determine the achievement of this Outcome. This will also allow the program to address the student concerns about achievement in a more focused manner by using these courses to reinforce the teamwork concepts.

**Student/Program Learning Outcome 15**

*“Understand construction quality assurance and control.”*

Summary

This Outcome is to be achieved at level 2 – Understand.

**Direct Measurements:**

**Student Work** (1-Remember, 2-Understand, 3-Apply, 4-Analyze, 5-Evaluate, 6-Create)

Course	Level of Achievement (1 - 6)	Achievement of Outcome (Y/N)
CMGT 245 – Drawings, Specifications & Codes	2	Y
CMGT 374 – Construction Operations & Improvements	6	Y
<b>AIC Exam by Outcome</b> (Average BSU Score)	<b>Fall 2016</b>	<b>Spring 2017</b>
15. Understand construction quality assurance and control.	73%	73.4%

**Indirect Measurements:**

**Senior Exit Survey** (1 to 5, 5 high)

Question	Fall 2016 n = 13		Spring 2017 n = 19	
	Importance	Achievement	Importance	Achievement
Understand construction quality assurance and control.	4.25	3.54	4.05	3.95

**Industry/Employer Survey** (1 to 5, 5 high)

Question	Fall 2015 n = 9
Do you feel that Boise State Construction Management Graduates have the ability to understand construction quality assurance and control?	3.80

The data from all of the instruments used to evaluate this Outcome indicate that this Outcome is being met. The student perception from the fall exit exam indicates that the students are looking for a level of understanding much greater than “understand”, and that this is an opportunity for our program to increase discussion on this topic.

**Student/Program Learning Outcome 17**

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

Summary

This Outcome is to be achieved at level 2 – Understand.

**Direct Measurements:**

**Student Work** (1-Remember, 2-Understand, 3-Apply, 4-Analyze, 5-Evaluate, 6-Create)

Course	Level of Achievement (1 - 6)	Achievement of Outcome (Y/N)
CMGT 385 – Construction Contracts & Law	6	Y
CMGT 475 – Construction Project Management	6	Y
<b>AIC Exam by Outcome</b> (Average BSU Score)	<b>Fall 2016</b>	<b>Spring 2017</b>
17. Understand the legal implications of contract, common, and regulatory law to manage a construction project.	75%	74.6%

**Indirect Measurements:**

**Senior Exit Survey** (1 to 5, 5 high)

Question	Fall 2016 n = 13		Spring 2017 n = 19	
	Importance	Achievement	Importance	Achievement
Understand the legal implications of contract, common, and regulatory law to manage a construction project	4.15	3.77	4.16	3.95

**Industry/Employer Survey** (1 to 5, 5 high)

Question	Fall 2015 n = 9
Do you feel that Boise State Construction Management Graduates have the ability to understand the legal implications of contract, common, and regulatory law to manage a construction project?	3.60

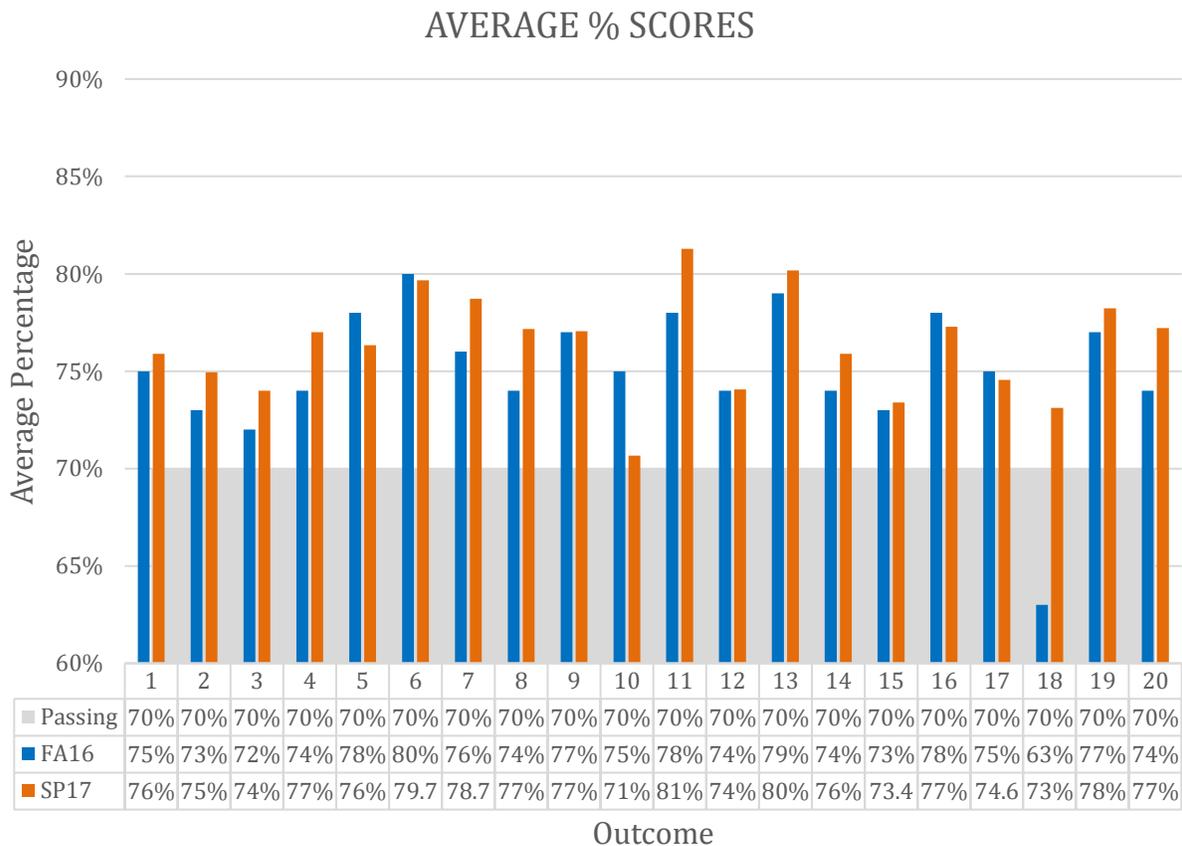
This Outcome continues to be met, but with room for improvement. Our students feel that this Outcome is important, but not as important as several of the others. Industry feels that our students and alumni are reasonably well prepared in this area, but not exceptionally well prepared. As a result, more work to strengthen this Outcome will be put into the curriculum.

### PART III – INSTRUMENTS USED FOR DATA COLLECTION AND ANALYSIS

Two of the instruments used to evaluate our program, the American Institute of Constructors Level 1 Exam, and the Graduating Senior Exit Survey, collect data concerning more than just the selected Student and Program Learning Outcomes for a given year. By collecting this data biannually, we are able to monitor the health, and identify areas of concern across the program on a yearly basis. This section describes the data collected, and the follow-up actions taken by the program to address any issues which have been identified.

#### American Institute of Constructors Level I Exam

Since the fall of 2015, AIC has reported student results by ACCE Outcome. ACCE has determined that any Outcome that has a required level of achievement of 6 (Create) or 3 (Apply) may not be used as a measure of student achievement. All other Outcomes may directly be evaluated by use of the AIC Level 1 exam. The average result for each Outcome is shown in Figure 2. Scores of 70% or higher are deemed to be acceptable.



**Figure 2 - Average AIC Results by Outcome**

In the fall of 2016 there were 22 students who took the test, with 16 passing. All 16 of those passing the test were taking the test for the first time. In the spring of 2017, 18 students took the test with 16 passing. All 16 of those passing the test were taking the test for the first time.

Between the two semesters, the average score of only one Outcome fell below the 70% mark. Outcome 18 (sustainable construction), an Outcome not specifically evaluated this year, continues to be an issue. Outcome 18, as well as Outcomes 8, 12, 15, 19, and 20 were seen as points of concern based on the results from the 2015-16 school year. It was determined last year to monitor student progress in these areas, and this year the results show a marked improvement in all but Outcome 18 in the fall. It is noted that by spring, the results for Outcome 18 had joined the rest of the results in being in the acceptable range. Adjustments have been made in courses to increase our student's awareness of sustainable construction, and while we plan to continue monitoring this Outcomes specifically, we feel we are moving in the right direction.

#### Follow-up Action

The results of the AIC exam, both those sections relevant to this year's Student/Program Outcomes as well as all the other sections were reviewed by the faculty. While the results from this year show our students readily demonstrating their understanding in each of the Outcomes, including Outcome 18 based upon the results from the spring, it is noted that just a year ago the results looked significantly different. These results can be volatile, and we do not have enough test data broken into the 20 Outcome format to determine trends for several of the Outcomes.

Last year the possibility of creating an additional course focused on sustainability and sustainable construction was discussed. This has not been done, and will not be done for the next couple years as we address resource issues. The shift of emphasis in the Mechanical, Electrical and Plumbing systems areas from design to a more construction oriented outlook has been begun. No measurable results have yet been achieved.



Data was collected from the courses highlighted in grey shown in Figure 3 for each of the Program Outcomes under review this year. The results of the analysis of the seven Outcomes reviewed this year may be found in the Outcome Summaries on pages seven to 13 above. All of the Outcomes reviewed this year continue to be met.

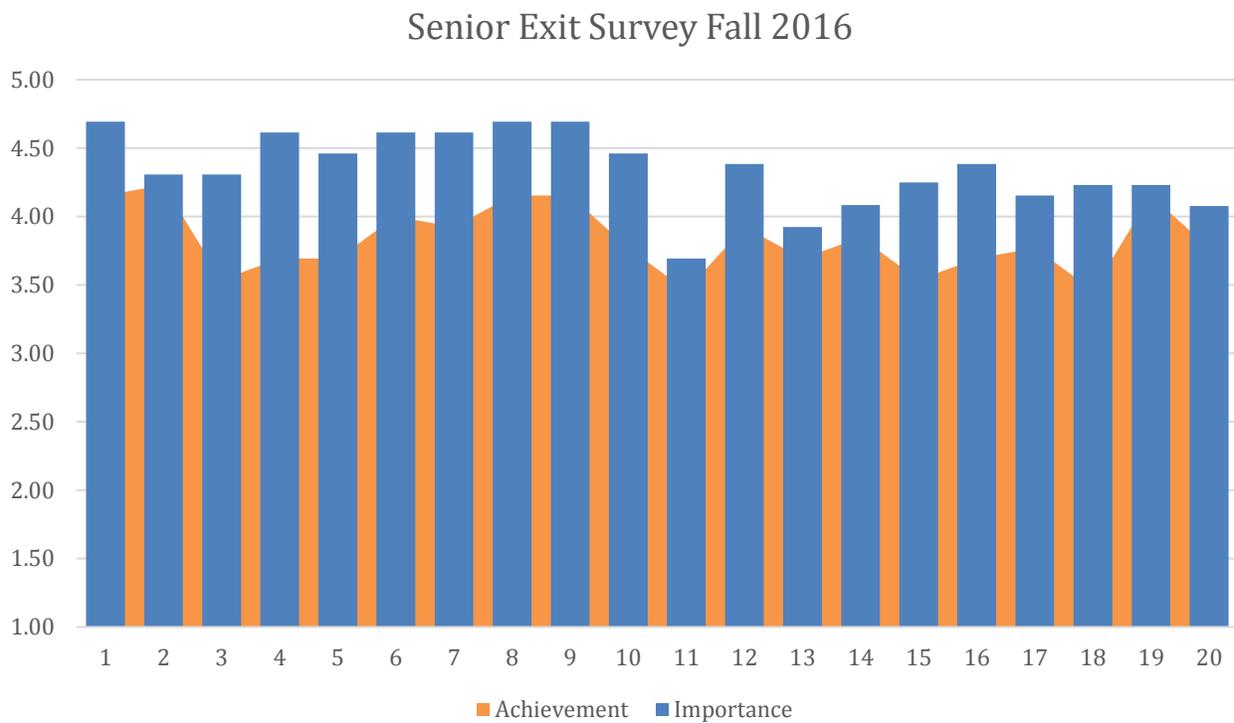
Follow-up Action

This data was reviewed by the faculty on September 18. It was agreed that the Outcomes being measured this year, as well as the other Outcomes continue to be met by the students. The students continue to doubt their own abilities in some areas. This may be interpreted as a desire on their part for more in-depth or advanced coverage of certain topics. The department is working to add some additional opportunities for the students.

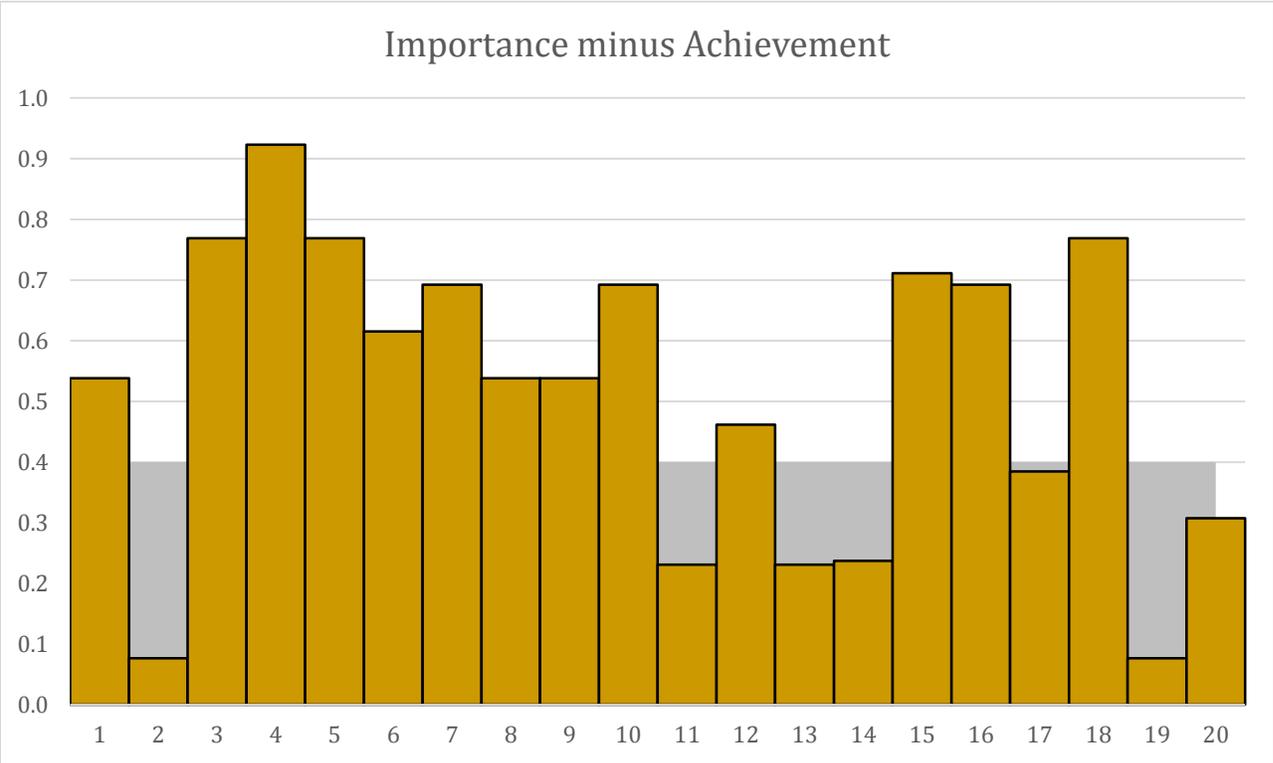
Graduating Senior Exit Surveys

At the end of each semester graduating seniors are polled by questionnaire to assess student perception of their achievement of the Student/Program Learning Outcomes.

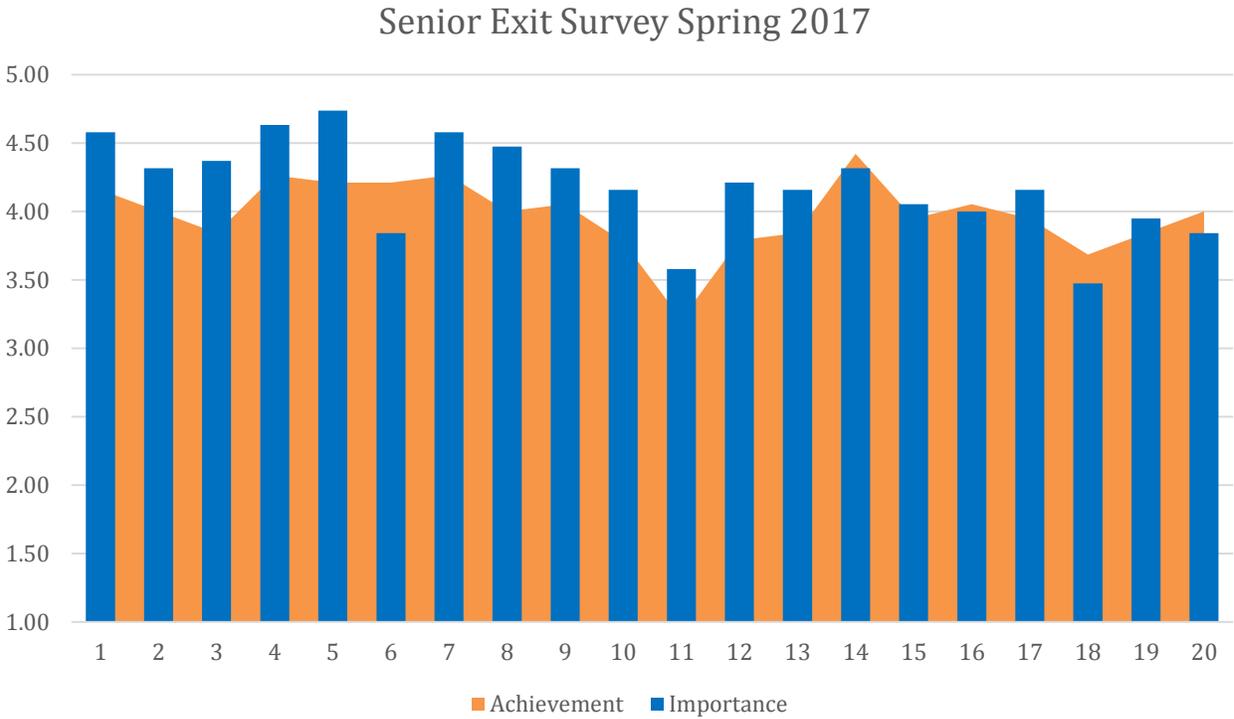
The questions the students were asked directly related to each of the Student/Program Learning Outcomes. The Figures 4 and 6 present the results of these questions where the students were asked how important are the Program Learning Outcomes, and how well they were able to achieve them by the time of graduation. The surveys used a five point scale, with one being low and five being high.



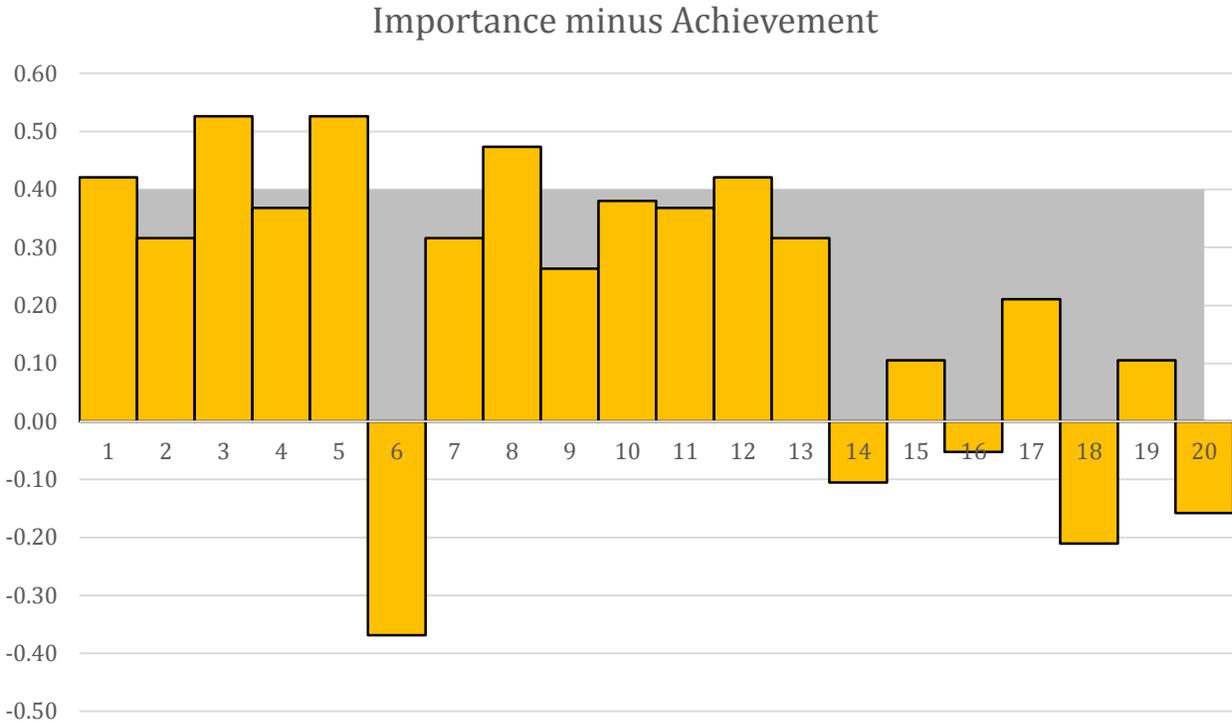
**Figure 4 - Student Perception of Program Learning Outcomes Fall 2016**



**Figure 5 - Difference between Achievement and Importance of Student/Program Learning Outcomes in the Fall of 2016**



**Figure 6 - Student Perception of Program Learning Outcomes Spring 2017**



**Figure 7 – Difference between Achievement and Importance of Student/Program Learning Outcomes in the Spring of 2017**

The students felt strongly that all of the Outcomes were important to their education. Figures 5 and 7 above present the difference in perception of the students between Importance of the Program Learning Outcomes and the Achievement of those same Outcomes. When reviewing this data the faculty expect there to be a difference between how significant the students feel an Outcome to be and how well they achieve it. Generally values on Figures 5 and 7 greater than 0.4 will be seen to warrant close scrutiny.

*Follow-up Action*

The Senior Exit Survey data for each semester was reviewed by the faculty, and it was noted that Outcomes 1 (written communications), 3 (safety plan), 5 (project schedules), 8 (materials, methods & equipment) and 12 (project delivery) showed signs of concern on the part of the students both semesters. A number of additional Outcomes were of concern to the students graduating in the fall. Upon review of student work, as well as student achievement on the AIC exam, it was determined that these Outcomes actually are being met, but the students do not understand this point.

In order to address some of the student perceptions in the coming year continued efforts will be made to reassure the students of their skills.

## Additional Assessment Measures

### Construction Competition Results

Boise State Construction Management student teams participating in the annual Associated Schools of Construction (ASC) Region VI and VII competition were competitive with student teams from other construction management programs in attendance. The Commercial team placed 1<sup>st</sup>, while several other teams performed well. Success in the student competition requires outstanding performance in teamwork, time management, and oral presentations in front of a live industry judging panel, as well as comprehensive knowledge and understanding of construction materials and methods, drawings, contract documents, cost estimating, scheduling, and project management and administration.