

Boise State University  
Department of Construction Management

2014-2015  
Quality Assessment Report  
and Action Plan

October 21, 2015

## **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 2014-2015 school year:

3. Create a construction project safety plan.
4. Create construction project cost estimates.
8. Analyze methods, materials, and equipment used to construct projects.
11. Apply basic surveying techniques for construction layout and control.
13. Understand construction risk management.
18. Understand the basic principles of sustainable construction.
20. Understand the basic principles of mechanical, electrical and piping system.

To do this three instruments were used:

- American Institute of Constructors Level 1 (Associate Constructor) Exam
- Review of Student Work
- Graduating Senior Exit Survey

Based on the data collected all of the Outcomes continue to be met. Collection of data using the Graduating Senior Exit Survey will need to be increased, but a mechanism has been put in place to address that. Student perception of their abilities also needs to be addressed. Students continue to demonstrate their understanding of the material, but feel unsure about themselves. Efforts will be made to reinforce their attitudes about their level of understanding.

## Table of Contents

PART I – PROGRAM ORGANIZATION.....	1
Mission.....	1
Vision.....	1
Student & Program Learning Outcomes.....	1
Program Objectives.....	2
Program Quality Assessment.....	2
Assessment of Student/Program Learning Outcomes.....	4
Assessment of Program Objectives .....	5
PART II – DATA AND ANALYSIS FOR THE 2014-15 SCHOOL YEAR .....	6
Student/Program Learning Outcome 3 .....	7
Student/Program Learning Outcome 4 .....	8
Student/Program Learning Outcome 8 .....	9
Student/Program Learning Outcome 11 .....	10
Student/Program Learning Outcome 13 .....	11
Student/Program Learning Outcome 18 .....	12
Student/Program Learning Outcome 20 .....	13
PART III – INSTRUMENTS USED FOR DATA COLLECTION AND ANALYSIS .....	14
American Institute of Constructors Level I Exam .....	14
Review of Student Work.....	16
Graduating Senior Exit Surveys.....	17
Alumni Surveys .....	18
Additional Assessment Measures .....	19
Advisory Committee Feedback.....	19
Construction Competition Results .....	19

## Table of Figures

Figure 1 – Program Assessment Process.....	3
Figure 2– AIC Results, BSU vs Minimum Score.....	14
Figure 3– AIC Results, BSU vs National Average.....	15
Figure 4– Courses vs Program Outcomes.....	16
Figure 5 - Student Perception of Program Learning Outcomes Spring 2015 .....	17
Figure 6 – Difference between Achievement and Importance of Student/Program Learning Outcomes in the Spring of 2015.....	18
Figure 7 – Perception of Importance and Achievement of Program Objectives by Alumni Fall 2014 .....	19

**Table of Tables**

Table 1 - Program Outcomes Assessment Plan..... 4

Table 2- Program Objectives Assessment Plan..... 5

## **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.

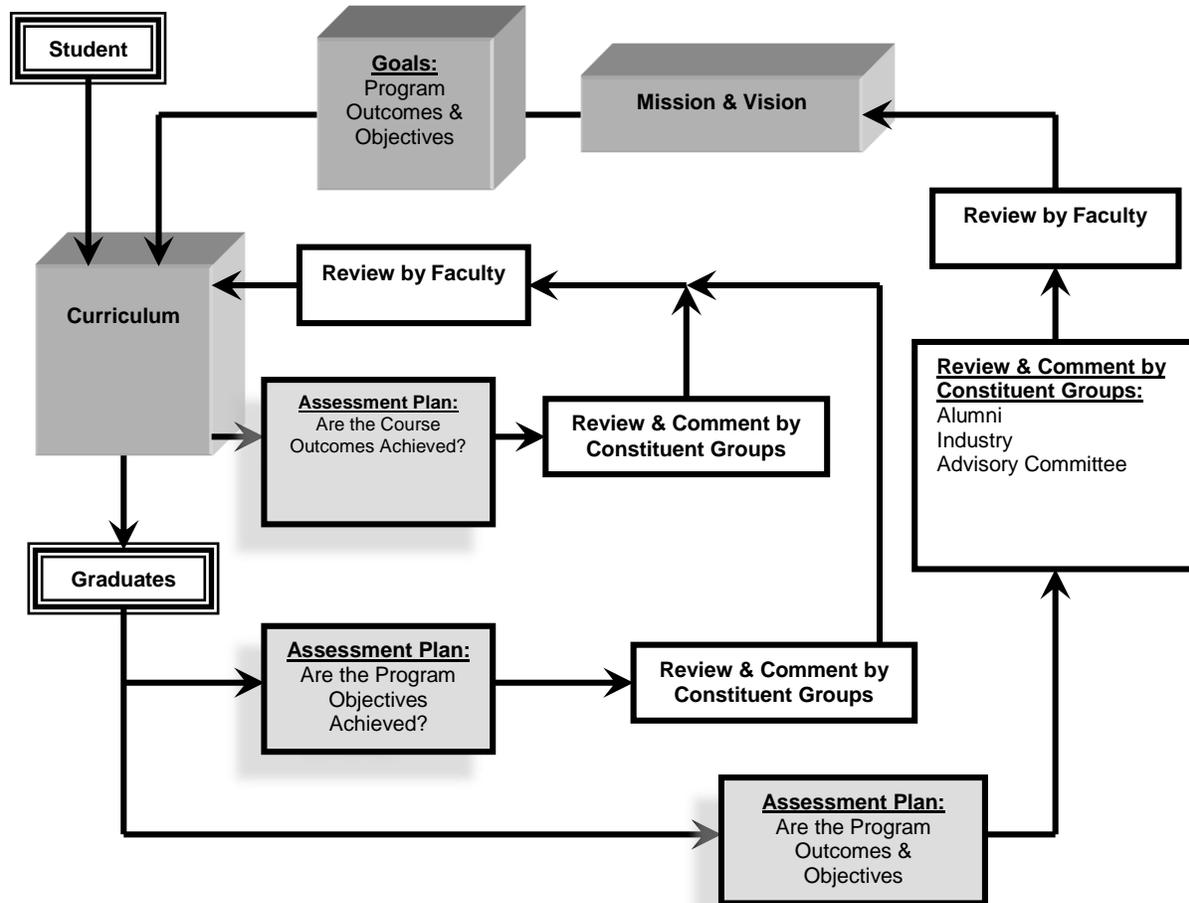
Students who are granted the Bachelor of Science in Construction Management will demonstrate knowledge and understanding in the following areas:

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>	<p>Direct: 6, 7, 8, 12, 13, 14, 15, 16, 17, 18, 19 &amp; 20</p> <p>Indirect: 1, 3, 4, 5 &amp; 11</p>	<p>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.</p>	<p>Twice per year (November and April)</p>
<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>	<p>All</p>	<p>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.</p>	<p>The 8 Program Outcomes are reviewed on a 3-year cycle</p>
<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>	<p>All</p>	<p>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.</p>	<p>At the end of every semester</p>
<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>	<p>All</p>	<p>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.</p>	<p>Every three years.</p> <p>Last conducted – Fall 2012</p> <p>Next survey - Fall 2015</p>

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 - Summer 2017</p>

## **PART II – DATA AND ANALYSIS FOR THE 2014-15 SCHOOL YEAR**

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

3. Create a construction project safety plan.
4. Create construction project cost estimates.
8. Analyze methods, materials, and equipment used to construct projects.
11. Apply basic surveying techniques for construction layout and control.
13. Understand construction risk management.
18. Understand the basic principles of sustainable construction.
20. Understand the basic principles of mechanical, electrical and piping system.

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

The Industry/Employer survey was not used since it is next scheduled to be deployed in 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 3

*"Create a construction project safety plan."*

#### 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 111 – Construction Materials & Methods Lab	3	N
CMGT 475 – Construction Project Management Project Plan assignment	6	Y

#### Indirect Measurements:

**AIC Exam** (BSU Score vs. AIC Minimum Score – normalized values shown, see Figure 2)

Category	Fall 2014	Spring 2015
8. Construction Safety	-0.02	0.12

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

Question	Fall 2014 n = NA		Spring 2015 n = 10	
	Importance	Achievement	Importance	Achievement
Create a construction project safety plan.	NA	NA	4.20	3.40

The data from the CMGT 111 course, often the first construction course taken by the students, demonstrates that many new students were uncomfortable with the concept of the project safety plan, however the data collected in the CMGT 475 course, one of the last courses taken by the students, as well as the results of the spring 2015 AIC exam, it is seen that the students to understand how to create a construction project safety plan.

The data from the fall 2014 AIC exam shows our students taking the exam at that time were not comfortable with the concepts involved with this Outcome. Upon review by the faculty it was noted that very few students took the AIC exam at that time, and that 25% of those taking the exam failed. In addition, when looking at the results of the spring 2015 senior exit survey and observing a large confidence gap expressed by our students, it evident that this is an area needing to be addressed.

On August 20, 2015 the faculty meet to discuss the data collected for the 2014-15 school year. It was felt that our students are much better prepared, and understand this material than they believe. Efforts will be made to address these perception issues in the coming year.

Overall it is felt that Outcome 3 continues to be met by the construction management program.

### Student/Program Learning Outcome 4

*“Create construction project cost estimates.”*

#### 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 367 – Construction Estimating Multiple Homework Assignments	6	Y
CMGT 460 – Project Cost Controls Homework Assignment	5	Y

#### **Indirect Measurements:**

**AIC Exam** (BSU Score vs. AIC Minimum Score – normalized values shown, see Figure 2)

Category	Fall 2014	Spring 2015
4. Bidding & Estimating	-0.01	0.08
5. Budgeting, Costs & Cost Controls	0.07	0.18

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

Question	Fall 2014 n = NA		Spring 2015 n = 10	
	Importance	Achievement	Importance	Achievement
Create construction project cost estimates.	NA	NA	4.60	3.60

Data collected for this Outcome, both from the AIC exam as well as student work, demonstrated that our students understand the concepts of this Outcome, and are able to apply the concepts. The perception gap demonstrated by the senior exit survey from the spring of 2015 does not appear to agree with these demonstrated results.

On August 20, 2015 the faculty met to discuss the data collected for the 2014-15 school year. It was felt that our students are much better prepared, and understand this material than they believe. Efforts will be made to address these perception issues in the coming year.

Overall it is felt that Outcome 4 continues to be met by the construction management program.

## Student/Program Learning Outcome 8

*“Analyze methods, materials, and equipment used to construct projects.”*

### Summary

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

#### **Direct Measurements:**

**AIC Exam** (BSU Score vs. AIC Minimum Score – normalized values shown, see Figure 2)

Category	Fall 2014	Spring 2015
4. Materials, Methods, & Project Modeling & Visualization	-0.12	0.00

**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 111 – Construction Materials & Methods Lab Homework Assignment	6	Y
CMGT 475 – Construction Project Management Exam 1, Question 7	6	Y

#### **Indirect Measurements:**

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

Question	Fall 2014 n = NA		Spring 2015 n = 10	
	Importance	Achievement	Importance	Achievement
Analyze methods, materials, and equipment used to construct projects.	NA	NA	4.40	3.30

The data collected from the courses associated with this outcome indicate that the students are able to readily meet this Outcome. The faculty agree with this upon review of the data. The results of the AIC exams do not present a strong a case, with students in the spring being able to just meet the defined minimum requirements. It is again the student perception as illustrated by the senior exit survey in the spring of 2015 that causes concern about meeting this Outcome.

On August 20, 2015 the faculty meet to discuss the data collected for the 2014-15 school year. It was felt that our students are much better prepared, and understand this material than they believe. Efforts will be made to address these perception issues in the coming year.

Overall it is felt that Outcome 8 continues to be met by the construction management program.

**Student/Program Learning Outcome 11**

*“Apply basic surveying techniques for construction layout and control.”*

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 111 – Construction Materials & Methods Lab Homework Assignment	3	Y

**Indirect Measurements:**

**AIC Exam** (BSU Score vs. AIC Minimum Score – normalized values shown, see Figure 2)

Category	Fall 2014	Spring 2015
9. Construction Geomatics	0.02	0.04

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

Question	Fall 2014 n = NA		Spring 2015 n = 10	
	Importance	Achievement	Importance	Achievement
Apply basic surveying techniques for construction layout and control.	NA	NA	3.80	2.90

For this Outcome, both the course work as well as the AIC exam results agree that our students are well able to handle the components of this Outcome. Once again, however, the student perception of their ability does not align with the demonstrated results. In order to meet the requirements of this Outcome, students are to demonstrate capabilities at level 3 – Apply. It is felt that many students feel they should be able to achieve a higher level of ability, and thus do not feel they have properly achieved the level of proficiency they would like. The student perception issue was discussed at a faculty meeting on August 20, 2015, and efforts are to be made in the coming year to address this concern.

Overall it is felt that Outcome 11 continues to be met by the construction management program.

**Student/Program Learning Outcome 13**

*“Understand construction risk management.”*

Summary

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

**Direct Measurements:**

**AIC Exam** (BSU Score vs. AIC Minimum Score – normalized values shown, see Figure 2)

<b>Category</b>	<b>Fall 2014</b>	<b>Spring 2015</b>
3. Management Concepts	0.02	0.07
5. Budgeting, Costs & Cost Controls	-0.01	0.08
7. Planning, Scheduling & Schedule Control	0.17	0.18
8. Construction Safety	-0.02	0.12
10. Project Administration	0.08	0.16

**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 385 – Construction Contracts & Law Homework Assignment #5	4	Y

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

<b>Question</b>	<b>Fall 2014 n = NA</b>		<b>Spring 2015 n = 10</b>	
	<b>Importance</b>	<b>Achievement</b>	<b>Importance</b>	<b>Achievement</b>
Understand construction risk management.	NA	NA	4.40	3.90

Risk Management covers concepts spanning many different aspects of the construction process. Our students continue to demonstrate their ability in this area through both their course work as well as the results of the AIC exam. Student perception of success again lags behind where the students feel they would like to be. This perception again does not match with students’ demonstrated ability in the field. Efforts will be made in the coming year to address the student perception issues.

Overall it is felt that Outcome 13 continues to be met by the construction management program.

**Student/Program Learning Outcome 18**

*“Understand the basic principles of sustainable construction.”*

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 475 – Construction Project Management Homework Assignment	6	Y

**Indirect Measurements:**

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

Question	Fall 2014 n = NA		Spring 2015 n = 10	
	Importance	Achievement	Importance	Achievement
Understand the basic principles of sustainable construction.	NA	NA	3.80	3.10

Sustainable construction principles are presented to our students in a number of courses. In the one course we selected to review for this Outcome, the students were well able to demonstrate their understanding of these principles. Once again the student perception of what they understand does not match with their demonstrated ability in the area. Efforts will be made in the coming year to address the student perception issues.

Overall it is felt that Outcome 18 continues to be met by the construction management program.

**Student/Program Learning Outcome 20**

*“Understand the basic principles of mechanical, electrical and piping system.”*

Summary

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

**Direct Measurements:**

**AIC Exam** (BSU Score vs. AIC Minimum Score – normalized values shown, see Figure 2)

<b>Category</b>	<b>Fall 2014</b>	<b>Spring 2015</b>
4. Materials, Methods, & Project Modeling & Visualization	-0.12	0.00

**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 350 – Mechanical & Electrical Installations Test 1, Question 3	4	Y

**Indirect Measurements:**

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

<b>Question</b>	<b>Fall 2014 n = NA</b>		<b>Spring 2015 n = 10</b>	
	<b>Importance</b>	<b>Achievement</b>	<b>Importance</b>	<b>Achievement</b>
Understand the basic principles of mechanical, electrical and plumbing systems.	NA	NA	4.40	3.90

The course used to evaluate this Outcome has been specially designed to address the issues and components of this Outcome. This is a rigorous course which goes far beyond level 2 – Understand level of competency. The results of the AIC exams do not illustrate the students’ level of instruction as well as the course, but between the two measures the students continue to demonstrate their understanding of the material. Once more the student perception of what they understand does not match with their demonstrated ability. Efforts will be made in the coming year to address the student perception issues.

Overall it is felt that Outcome 20 continues to be met by the construction management program.

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

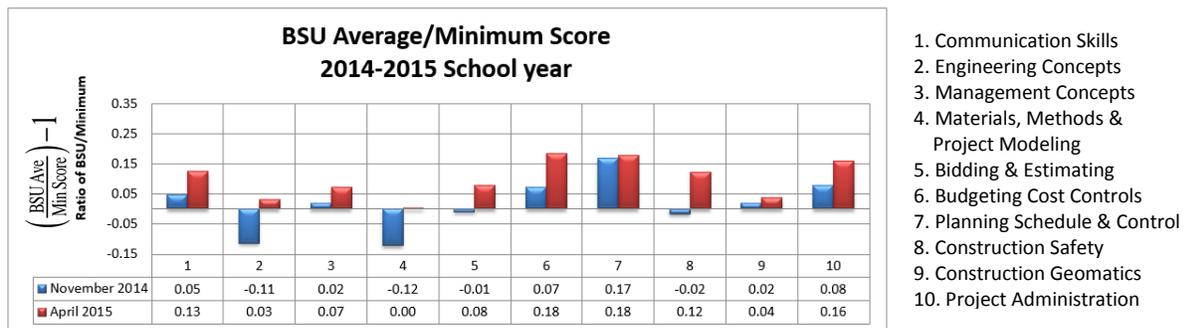
Two of the instruments used to evaluate our program, the American Institute of Constructors Level 1 Exam, and the Graduating Senior Exit Survey, collect data concerning more than just the selected Student and Program Learning Outcomes for a given year. By collecting this data biannually, we are able 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

The bar charts below show the results of the November 2014 and April 2015 AIC Level I Exams. The values shown in the first chart are based on a comparison of the average score obtained by Boise State students compared to the scores that AIC considers to be the minimum acceptable using the following relationship:

$$\left( \frac{\text{BSU Average}}{\text{Minimum Score}} \right) - 1$$

Using this relationship all 10 sections of AIC Level I Exam are normalized to zero. Scores greater than zero mean our students are performing above the minimum acceptable value, and scores below zero means our students are performing below the minimum acceptable value.



1. Communication Skills
2. Engineering Concepts
3. Management Concepts
4. Materials, Methods & Project Modeling
5. Bidding & Estimating
6. Budgeting Cost Controls
7. Planning Schedule & Control
8. Construction Safety
9. Construction Geomatics
10. Project Administration

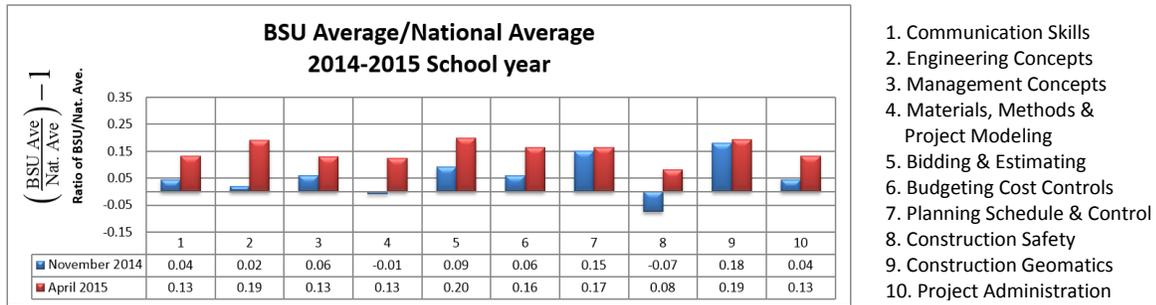
**Figure 2– AIC Results, BSU vs Minimum Score**

When reviewing the data from the AIC exam it was noted that the relevant portions of the exam for the seven Program Outcomes under consideration this year, almost all show that our students, on average, are scoring above the minimum required score. Those areas used this year are:

3. Management Concepts
4. Materials, Methods & Project Modeling
5. Bidding & Estimating
7. Planning Schedule & Control
8. Construction Safety
9. Construction Geomatics
10. Project Administration

In the fall of 2014 there were 12 students who took the test, with nine passing. Eight of those nine passing the test were taking the test for the first time. In the spring of 2014, 20 students took the test with 18 passing. Of those 20, 17 were first time test takers, all of whom passed.

Students taking the test in the fall of 2014 had considerably more difficulty with this test than their counterparts taking the test in the spring of 2015. In the fall our students had problems with the content areas of 2. Engineering Concepts, 4. Materials, Methods and Project Modeling, 5. Bidding and Estimating and 8. Construction Safety, all of which fell below the AIC minimum acceptable score. It is also noted that all of these area showed significant improvement in the spring. There were also significant improvements on several other areas in the spring compared to the fall.



**Figure 3- AIC Results, BSU vs National Average**

When comparing the work of Boise State students to the National Average it is seen that even in the areas of concern listed above Boise State students outperform the National Average significantly in most areas. 8. Construction Safety continues to be an area of concern, both at Boise State as well as nationally.

**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 on September 21, 2015. Two sections of the test stood out as being areas of concern, Engineering Concepts and Materials, Methods, and Project Modeling and Visualization. Since these two sections are poorly defined in the current review manual as to their content, it is difficult to determine specific areas of weakness.

The significant improvement from the fall to spring was again noted. When looking at the test results for the past four years it is noted that students taking the test in the spring do notably better than those taking the test in the fall. It was felt that this related to which courses had been completed and which courses were being taken at the time of the exam. Overall the faculty felt the results did not prompt any need for change of what was delivered in our courses. It decided that the review sessions should continue, with the idea of generating some review material ourselves rather than relying solely on the review manual. It was also determined that the students most likely to fail are those taking the test for the second or third time. First time test takers have an 85% pass rate over the past four years.



least 70%. The results of this analysis may be found in the Outcome Summaries on pages nine to 15 above. All but one course assignment was found to successfully demonstrate that the students were able to do work related to a specific Outcome. The failure of the one assignment in question, from CMGT 111, was found to be related to the age and experience of the students. CMGT 111 is often one of the first two or three construction classes taken by our students, and it was felt that they had some difficulty understanding the significance of the concepts. In later classes, after gaining perception on the construction industry, students were readily able to handle the Outcome in question.

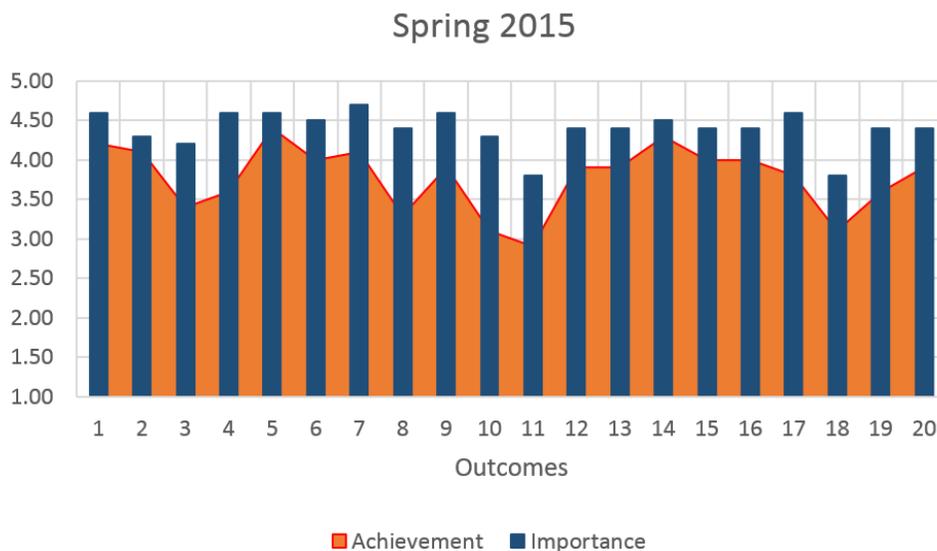
Follow-up Action

This data was reviewed by the faculty beginning with a faculty meetings on October 19, 2015. The review is to continue throughout the 2015-16 school year. During these meetings the faculty will define the meaning of the Student/Program Learning Outcomes, and to refine the matrix shown in Figure 4. The faculty continue to feel that this method of gaining an overview of the various Outcomes in the program functions well, and that the frequency of this analysis did not need to be increased.

Graduating Senior Exit Surveys

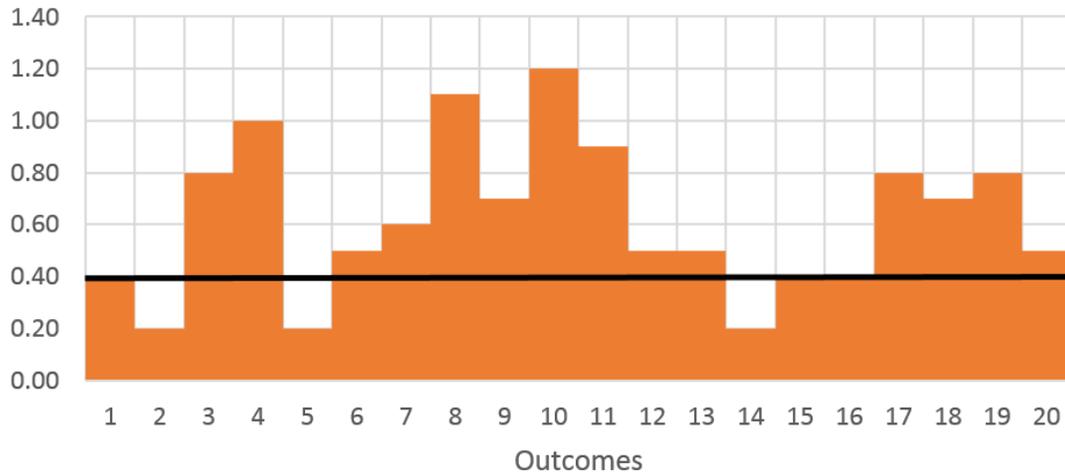
At the end of each semester graduating seniors are polled by questionnaire to assess student perception of their achievement of the Student/Program Learning Outcomes. In 2014 the Program Learning Outcomes were revised. Along with that revision a new survey was devised and executed in the fall of 2014. While only seven students graduated in the fall of 2014, all of the data was lost due to problems with the software used to conduct the survey. Twenty students graduated in the spring of 2015, with ten surveys being completed.

The questions the students were asked directly related to each of the Student/Program Learning Outcomes. The Figures 5 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 5 - Student Perception of Program Learning Outcomes Spring 2015**

## Difference between Achievement and Importance of Program Learning Outcomes



***Figure 6 – Difference between Achievement and Importance of Student/Program Learning Outcomes in the Spring of 2015***

The students felt strongly that all of the Outcomes were important to their education. Figure 6 above presents 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 Figure 6 greater than 0.4 will be seen to warrant close scrutiny.

### Follow-up Action

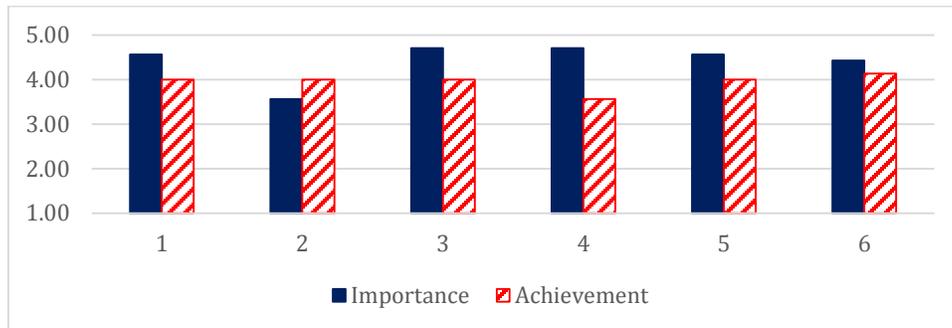
This data was reviewed by the faculty on August 20, 2015. Concern was expressed at the sample size (n = 10), and that a single student could skew the results. It was felt that the perceptions of the students did not align with demonstrated results. Evaluation of student work in classes showed our students to be very capable of meeting the program Outcomes, as did the results of the AIC exams. In addition our students, especially in the spring, did very well on the AIC exam with all of our first-time takers passing the test. These same students performed very well at the Associated Schools of Construction Region VI and VII competition in the spring, and virtually all had employment offers at graduation.

In order to address some of the student perceptions in the coming year efforts will be made to reassure the students of their skills, demonstrate our use of technology and to increase the number of students responding to the survey. There will also be a change in collecting data from the students by returning to a more one-on-one approach of an exit interview along with the survey.

### Alumni Surveys

The most recent alumni survey was conducted in Fall of 2014 of alumni who graduated from the

program between the Fall of 2008 and the Spring of 2011 (graduating roughly three to five years prior to the survey). About 15% (n = 7) of those queried responded to the survey. The participants were asked to evaluate the Importance of the six Program Objectives (see page 2) and to then evaluate how well they feel they have achieved those objectives on a scale of one to five, with five being best. The average of all the responses is shown in Figure 8 below.



**Figure 7 – Perception of Importance and Achievement of Program Objectives by Alumni Fall 2014**

The average response indicates that our alumni either agree or strongly agree that our Program Objectives are important to the discipline. They also indicate that they feel they have been able to achieve those objectives or are in the process of doing so.

The respondents indicated that the majority of them have earned promotions since joining the work force. Most have changed companies at least once since graduation, and approximately half have gone on to earn a second degree, usually in business.

Follow-up Action

Data indicates the program is on the correct course. The next survey will be conducted during the summer of 2017 of alumni who graduated from the program between the Fall of 2011 and the Spring of 2014. In the interim strategies will be discussed and developed to obtain a greater response rate for future surveys with both the faculty and with the Industrial Advisory Board..

Additional Assessment Measures

Advisory Committee Feedback

In Fall 2011, Construction Management Advisory Council members were tasked with reviewing the course objectives for each CMGT course and providing feedback on importance and relevancy. This is intended to be an ongoing activity, although the cycle frequency has not yet been determined.

Follow-up Action

A new Industrial Advisory Board was created in the Spring of 2015. One of the first tasks that will be placed before the Board in the Fall of 2015 will be to review the program. The Industrial Advisory Board will also be asked to help design a new Strategic Plan for the program.

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 Determining Risk team placed 1<sup>st</sup>, The Design Build team placed 2<sup>nd</sup>, and the Mixed Use team placed 3<sup>rd</sup>. 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.