Boise State University
Department of Construction Management

2010-2011 Quality Assessment Report and Action Plan

October 3, 2011
Executive Summary

In 2010-2011, the Construction Management Department collected data from a number of sources in order to assess the achievement of our stated Program Outcomes and Objectives. This report presents and provides an analysis of data from:

- American Institute of Constructors Level I Exam (November 2010 and April 2011)
- Graduating Senior Exit Surveys
- Alumni Surveys

In addition, the report provides information on assessment measures scheduled for 2011-2012, including an ongoing review of student work and an industry / employer survey.

Data gathered in 2010-2011 indicate that graduates are performing at a higher level than national averages in similar programs in content areas related to our stated Program Outcomes. A continuing need for improvement exists in the area of written communications. Changes in the curriculum are proposed for implementation in Fall 2012 to address this.

Graduating senior exit surveys do not directly request feedback that can be tied to specific Program Outcomes. It is recommended that the faculty review the survey questions for the 2011-2012 assessment cycle.

Alumni survey responses indicate possible ambiguity in the stated Program Objectives. It is recommended that the faculty review these in 2011-2012 in light of the results of this survey.
Mission
To provide a comprehensive education for the development of professional constructors who, through innovation, character and ability are prepared to meet the construction needs of society.

Vision
To be recognized for providing consistent, high quality education for construction management professionals.

Program Outcomes
Program 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. Demonstrate a proficiency in all forms of communication
2. Be able to read and interpret contract plans, specifications and documents
3. Be able to accurately estimate construction projects with the use of modern tools
4. Be knowledgeable of the necessity for professional integrity and ethical responsibility
5. Be knowledgeable of materials, and be able to employ appropriate methods for their use and application
6. Use their knowledge of productivity, utilization and efficiency to determine the selection of appropriate equipment for various types of projects
7. Have the knowledge and ability to schedule projects using modern tools
8. Understand and apply the basic principles of business and economics
9. Be knowledgeable of the major issues concerning contract law
10. Demonstrate an understanding of the various aspects of project management and administration
11. Be knowledgeable of safety regulations and safe project management and control
12. Perform well in a multi-disciplinary team environment
13. Demonstrate knowledge of engineering principles for construction applications

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.

Course Outcomes are the specific, measurable learning outcomes identified for each course offered by the department. 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.
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;
- graduating senior exit interviews;
- 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 Program Outcomes**

The table below lists our planned assessment methods for each Program Outcome listed previously (page 3).

**PROGRAM OUTCOMES ASSESSMENT PLAN**

<table>
<thead>
<tr>
<th>Assessment Measure</th>
<th>Goals Addressed: (list by number)</th>
<th>How is the information used?</th>
<th>Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Institute of Constructors Level 1 (Associate Constructor) Exam</td>
<td>2, 4, 5, 6, 7, 9, 11, 12</td>
<td>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.</td>
<td>Twice per year (November and April)</td>
</tr>
<tr>
<td>Review of Student Work</td>
<td>All</td>
<td>Faculty review student performance on selected assignments, projects or exams to measure whether the learning objectives for each course are being achieved and at what level. Faculty address weaknesses by revising course objectives or content as appropriate.</td>
<td>Ongoing</td>
</tr>
</tbody>
</table>
**Assessment of Program Objectives**

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</table>
| Graduating Students Exit Interviews  
These questionnaires are designed to evaluate the level at which graduating seniors believe they have achieved the CM Program Outcomes. Graduating Student Exit Interviews are conducted at the end of each semester. | 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 |
| Industry/Employer Surveys  
These questionnaires are designed to evaluate the relevance and achievement of CM Program Outcomes with respect to current industry requirements. | 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. |
PROGRAM OBJECTIVES ASSESSMENT PLAN

<table>
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<th>How is the information used?</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Alumni Surveys</td>
<td>All</td>
<td>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.</td>
<td>Alumni: Every three years</td>
</tr>
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<td>All</td>
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<td>Every three years</td>
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Summary of the most recent assessment cycle

Consistent with the Assessment Plan, the following sections provide a summary presentation and analysis of data collected during the most recent assessment cycle.

American Institute of Constructors Level I Exam
The table below shows the results of the November 2010 and April 2011 AIC Level I Exam, along with national averages, and the scores that AIC considers to be the minimum acceptable. Although Boise State Construction Management students consistently perform above the national averages in all areas covered, scores in the content area of Communication Skills remain below the AIC minimum acceptable score.

Follow-up Action
To address this continuing weakness, the program has developed a new course in Construction Communications, for implementation in Fall 2012.
AIC LEVEL I EXAM RESULTS 2010-2011

<table>
<thead>
<tr>
<th>Content Area</th>
<th>Minimum Acceptable Score</th>
<th>November 2010 Boise State (14 tested, 14 passed)</th>
<th>November 2010 National Average</th>
<th>April 2011 Boise State (22 tested, 21 passed)</th>
<th>April 2011 National Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication skills</td>
<td>12</td>
<td>10.71**</td>
<td>10.68</td>
<td>11.45**</td>
<td>10.69</td>
</tr>
<tr>
<td>Engineering Concepts</td>
<td>19</td>
<td>23.36</td>
<td>18.91</td>
<td>21.27</td>
<td>18.76</td>
</tr>
<tr>
<td>Management Concepts</td>
<td>9</td>
<td>11.50</td>
<td>9.54</td>
<td>10.73</td>
<td>9.48</td>
</tr>
<tr>
<td>Materials, Methods, and Plan Reading</td>
<td>22</td>
<td>24.71</td>
<td>22.88</td>
<td>24.36</td>
<td>22.75</td>
</tr>
<tr>
<td>Bidding and Estimating</td>
<td>36</td>
<td>42.21</td>
<td>35.49</td>
<td>39.86</td>
<td>35.62</td>
</tr>
<tr>
<td>Budgeting, Costs, and Cost Control</td>
<td>21</td>
<td>25.29</td>
<td>21.74</td>
<td>24.64</td>
<td>21.59</td>
</tr>
<tr>
<td>Planning, Scheduling, and Control</td>
<td>34</td>
<td>39.29</td>
<td>35.34</td>
<td>39.91</td>
<td>35.50</td>
</tr>
<tr>
<td>Construction Safety</td>
<td>15</td>
<td>16.07</td>
<td>15.81</td>
<td>17.09</td>
<td>15.99</td>
</tr>
<tr>
<td>Surveying and Project Layout</td>
<td>4</td>
<td>5.14</td>
<td>4.52</td>
<td>5.14</td>
<td>4.53</td>
</tr>
<tr>
<td>Project Administration</td>
<td>39</td>
<td>46.21</td>
<td>39.49</td>
<td>42.55</td>
<td>39.56</td>
</tr>
</tbody>
</table>

**Area of Weakness

Review of Student Work
Student Work was not reviewed in 2010-2011.

Follow-up Action
A new system and structure for reviewing student work on an ongoing basis is being implemented for 2011-2012. Course binders have been set up for every course taught by Construction Management faculty (all CMGT courses plus ENGR 310). Attachment 1 has an example Table of Contents showing the materials that are to be included for review in each Course Binder. Attachment 2 has examples of the ongoing measurement of Course Objectives and accompanying Reflective Notes. One cycle of review for every course will be completed and the data presented in the 2011-2012 department assessment report.

Graduating Student/Post-Graduate Student Questionnaires
A questionnaire is given by Boise State’s office of Institutional Analysis, Assessment and Reporting to graduating seniors from all departments within the College of Engineering to assess student perception of their particular program and achievement and importance of various general learning objectives. Fifteen student responses are included in the Fall 2010-Spring 2011 survey results. These results show that the two areas where students felt they had achieved the most learning between entering and exiting the program were
communicating effectively in speech (related to Program Outcome #1) and making ethical choices in daily life (related to Program Outcome #4).

The department chair conducted individual exit interviews with graduating seniors to get personal feedback on students’ overall experience in the program. With respect to the curriculum, a number of students expressed interest in adding instruction on building information modeling (BIM). As a result, the department arranged to offer a 1-credit BIM workshop, to be offered in October 2011.

**Follow-up Action**
The current format of the graduating senior exit interviews does not directly request feedback about achievement of the individual Program Outcomes. This is something for the faculty to consider changing for the 2011-2012 assessment cycle.

**Alumni Surveys**
In June 2011, alumni who had graduated from the program between Fall 2005 and Spring 2008 were contacted by email and provided with a link to an online survey. Thirteen responses were received. Survey results are summarized and presented in Attachment 3.

Survey responses showed the greatest agreement that alumni had achieved Program Objective #2: *knowledge of mathematics, statistics and physics in order to appropriately anticipate the behavior of the materials, equipment, and methods used in construction.* There was the least confidence and / or disagreement in the achievement of Objective #5: *knowledge of the total project process;* and Objective #6: *an appreciation of the need for, and the value of, ... sustaining or developing one’s own career growth.* It may be that these responses indicate some ambiguity in how Objectives 5 and 6 are written. A goal for 2011-2012 will be for the faculty to review the Program Objectives for clarity and relevance.

Alumni made the following suggestions for improving the curriculum:
- more rigorous math
- collaboration with civil engineering
- construction (as opposed to engineering) surveying
- capstone project

Alumni also expressed interest in adding content in the following areas:
- electrical engineering
- energy construction
- soft skills
- design documents
- organizational behavior
- civil construction
- contract negotiation
- innovation and entrepreneurship

**Follow-up Action**
The majority of these suggestions underscore the changes that have already been made in the curriculum since these alumni graduated three to five years ago. For example, current CMGT courses have substantial emphasis on soft skills (CMGT 240), design documents (CMGT 245), civil construction (CMGT 320, CMGT 410 and CMGT 420), and contract
negotiation (CMGT 385 and CMGT 475). CMGT 475 is now designed as a capstone project class, and plans are being made to teach a construction surveying “boot camp” in 2012. Faculty will continue to review these comments in conjunction with the related comments from the Industry / Employer survey when it is conducted.

*Industry / Employers Questionnaires*

The industry/employer questionnaire is administered every 3 years and is scheduled for 2011-2012. In addition, Construction Management Advisory Council members have been tasked with reviewing the course objectives for each CMGT course and providing feedback on importance and relevancy. This feedback will also be received and reviewed by the faculty in 2011-2012. An example feedback form is provided in Attachment 4.

**Additional Assessment Measures**

*Construction Competition Results:*

Boise State Construction Management student teams participating in the annual Associated Schools of Construction (ASC) Region VI competition were competitive with student teams from other construction management programs in our region. The Heavy Civil team placed first, the Design Build team placed 2nd, and the Multi-family team also placed 2nd. 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.
Attachment 1

Example Table of Contents for Course Review Binders

(Implemented in 2011-2012)
Attachment 2

Examples of Course Objectives Measurement and Reflective Notes

(Implemented in 2011-2012)
Attachment 4

Example Constituent Feedback Form

(Implemented in 2011-2012)