

2014 Construction Management Program Information

This document summarizes program assessment information for the UNLV Construction Management program. The program is accredited by the American Council for Construction Education (ACCE). Our most recent accreditation visit occurred in April 2014 and the program received full-term reaccreditation in at ACCE's Board of Trustees meeting in July 2014.

1. UNLV BS in Construction Management Program Objectives

The UNLV BS in Construction Management focuses on four (4) specific objectives. These objectives are:

1. Prepare students for careers in construction management, including:
 - a. Contemporary knowledge in project estimating, planning, scheduling and control,
 - b. Contemporary knowledge of construction sciences and practices,
 - c. Contemporary knowledge of risk management, safety, litigation and documentation,
 - d. State-of-the-art skills in computerization and information technology,
 - e. Ability to define and solve problems,
 - f. Sound written and verbal communication skills,
 - g. Sound interpersonal and leadership skills,
 - h. Ability to function on interdisciplinary teams,
 - i. Understanding of professional and ethical responsibilities,
 - j. Understanding of professional customer service and quality,
2. Provide academic background to succeed in certification
3. Provide academic background to succeed in graduate studies
4. Provide a program that meets ACCE accreditation criteria

2. Admission Requirements for Construction Management Students

University admission requirements are described in detail at the following links:

Freshmen Students: <http://www.unlv.edu/admissions/requirements/freshmen>

Transfer Students: <http://www.unlv.edu/admissions/requirements/freshmen>

International Students: <http://www.unlv.edu/admissions/requirements/international>

Graduate Students: <http://graduatecollege.unlv.edu/admissions/>

Howard R. Hughes College of Engineering has additional admission requirements which are described at: <http://engineering.unlv.edu/advising/prospective/admission.html>

The Department of Civil & Environmental Engineering and Construction does not have any additional admission requirements.

3. UNLV BS in Construction Management (BSCM) Quality Improvement Plan

A continuous improvement process ensures that the BSCM program provides students with the best possible undergraduate education in construction and prepares them to become successful construction managers. In that pursuit, the Construction Management Program strives to provide the following learning outcomes:

1. Graduates have a fundamental grounding in mathematics, physics, and statistics.
2. Graduates have a strong grounding in business (business, law, economics, engineering economics, and management).
3. Graduates have the ability to communicate effectively in written format and to provide professional presentation appropriate to the situation and audience.
4. Graduates have the ability to use modern construction management tools in construction management practice.
5. Graduates are aware of basic principles of ethical and professional conduct in providing for safety and health to construction practice.
6. Graduates fulfill a broad construction management curriculum to include required courses in construction management and construction science.

Direct and indirect assessment measures are employed to regularly evaluate our success in achieving these learning outcomes. These assessments collect information from all of our constituents – current students, graduates, alumni, employers, and interested community

members. These data are evaluated by the CM faculty with help from key Advisory Board members to identify curricular and program changes to better attain the learning outcomes. Discussions of potential programmatic changes are initiated by CM faculty, presented to the Department's Undergraduate committee, and then voted on by the entire CEEC faculty. Once approved by the faculty, changes must also be approved by College and University Curriculum Committees prior to implementation.

This Quality Improvement Plan is a continuous process and assessment results are analyzed immediately upon receipt. However, organized annual evaluations of all available assessment results are conducted to ensure that the process leads to a continuously improving program.

4. Program Assessment Measures and Results

A range of instruments are employed to assess how well our program accomplishes the learning objective and program outcomes. The measures employed and the schedule of their deployment is as follows:

Assessment Instrument	Learning Outcomes	Person(s) Responsible	Data Collection
American Institute of Constructors' Associated Constructor Level I Exam	All	CEM 455 Instructor	Spring Semester
Student Exit Interviews & Surveys	All	Dept. Chair	Graduation Semester
Student course evaluations	All	Dept Chair	Every Course
Alumni Surveys	All	Advisory Board	Biannual
Employer Surveys	All	Advisory Board	Biannual

Additional assessments are employed as appropriate. The most recent data and assessments from each instrument are provided below.

a. American Institute of Constructors' Associated Constructor Level I Exam

Construction Management Seniors takes the American Institute of Constructors' Associated Constructor Level I – Construction Fundamentals examination as part of CEM 455 Construction Management Practice. This course is taken in the student's final semester. All students must take the exam and the results comprise a portion of their course grade.

The program uses this examination as a measure of academic quality. The goal established by the program is to exceed the national average pass rate on the exam. Historically, the performance of UNLV CM students has exceeded that goal; the data are shown in the table below.

Historical UNLV Student Results on American Institute of Constructors'
Associated Constructor Level I Exam

Year	UNLV Students			National (% Passing)
	Taking	Passing	% Passing	
2014	8	6	75	49
2013	13	11	85	53
2012	8	6	75	58
2011	5	4	80	61
2010	19	17	89	62
2009	12	11	92	67
2008			82	58
2007			88	65
2006			80	58
2005			62	61
2004			82	51
2003			67	48

The American Institute of Constructors' Associated Constructor Level I Exam provides significantly more information than just the pass rate. The table below shows the 2014 results from the 8 UNLV students who took the exam. UNLV students scored, on average, better than the national average in every subject area. Still, several subjects were considered to be areas of weakness by AIC. These include Engineering Concepts; Materials, Methods, and Project Modeling and Visualization; Bidding and Estimating; and Construction Geomatics. These subjects are also considered areas of weakness nationally (based upon the national average score) because the National Average is less than the minimum acceptable score.

2014 Subject Area scores for UNLV students compared to the national average.

Subject Area	UNLV Avg.	National Avg.	Maximum Possible	Minimum Acceptable
Communication Skills	22.78	20.22*	31	22
Engineering Concepts	10.22*	9.08*	15	11
Management Concepts	27.11	25.00*	36	25
Materials, Methods, and Project Modeling and Visualization	21.22*	20.49*	31	22
Bidding and Estimating	31.22*	28.62	45	32
Budgeting, Costs, and Cost Control	26.11	23.11	33	23
Planning, Scheduling, and Schedule Control	33.78	32.37	45	32
Construction Safety	16.89	15.12	21	15
Construction Geomatics	4.89*	4.59*	7	5
Project Administration	28.00	26.27	36	25

*considered to be an area of weakness by AIC

b. Fall 2013 CM Course/Curriculum Review

Assessment results from 2011-2013, casual inquiries within the community, and the continual need to improve the program suggested that a comprehensive review of all existing CM courses in the program could potentially be useful. This review conducted by the IAB Curriculum Committee on November 1, 2013. Dr. Hayes and Dr. Shields along with the nine members of the local construction community met at UNLV for 3 hours to review all 21 CEM undergraduate courses. The 9 industrial participants were:

- Greg Desart, Geotechnical and Environmental Services
- Jerry Englehart, Aggregate Industries
- Kevin Love, Carollo Engineers
- Cynthia Moore, CJM Innovations
- Bryan Richards, PENTA
- Jonna Samson, CEEC
- Charles Thomas, Timet
- Adam Werner, Clark County Water Reclamation District
- Jeff Wood, McCarthy Construction

This intensive review of the CM curriculum provided useful insights into what local employers are looking for in BSCM graduates. It also served to better inform the participants of the rigor within the current program. Many verbal comments were made about how “surprised” they were about the depth and breadth of the curriculum; they found it to be much more than they expected based upon their previous understanding. It also served to provide a foundation for our future discussion on program changes.

The review revealed that our required construction graphics course, AAD 267, is now using Rhino 3D as the software platform. Our expectation was that they were teaching REVIT. Discussions at the meeting showed little interest in Rhino 3D within our community and a strong preference for a rigorous Building Information Modeling/REVIT course.

c. Alumni and Employer Surveys

The IAB’s Curriculum Committee developed and deployed Alumni and Employer surveys in Spring 2013. These surveys included the Construction Management and Civil Engineering programs. The surveys were designed so that each could be deployed as singular surveys (Alumni and Employer) to simplify delivery. The Employer Survey garnered 30 responses while the Alumni Survey garnered 17; CM-related responses were the majority of both with 19 and 10, respectively.

While the 2012 survey results did not provide any startling results, there were some clear take away messages for the program. Overall, employers are satisfied with the program and our graduates. Alumni also are generally satisfied. Most respondents chose “Agree” for most positively stated questions rather than “Strongly Agree.” On the surface, this looks like all good news. However, we hoped for a much higher level of satisfaction from the biased audiences who took this survey. This tempered response likely results from a combination of factual observations, i.e. they truly have found areas in which we need to improve, and perception resulting from historical communication with the University. This lack of overwhelmingly positive results led to a complete review of the CM curriculum conducted in Fall 2013.

Revised Alumni/Employer surveys will be distributed in Spring 2015.

d. Individual Course Assessments

Internal reviews monitor performance of faculty and students on a routine basis to identify issues and concerns quickly and ensure program delivery remains at a high level. Every course includes formal, anonymous evaluation by the students. The evaluation consists of three parts, course content, faculty performance, and student comments. These reviews are compiled by the College of Engineering and student comments transcribed to electronic form to ensure anonymity. The results are provided individually to each faculty member and collectively to the Department Chair. The Department Chair uses the information to identify potential strengths, weaknesses, and concerns, then address those with individual instructors as appropriate. Actions are taken by the Department Chair, in consultation with the Dean, to remedy identified concerns as appropriate. Recently, course evaluation results have been summarized and distributed to all faculty in the following form:

CEEC Spring 2014 Teaching Evaluation Summary

5.00	4.86	4.66	4.57	4.39	4.10	3.72
5.00	4.80	4.65	4.53	4.37	4.06	3.70
5.00	4.79	4.64	4.53	4.25	4.03	3.57
4.99	4.77	4.62	4.50	4.21	4.02	3.26
4.96	4.72	4.58	4.49	4.21	3.91	3.24
4.91	4.71	4.57	4.49	4.18	3.90	3.23
4.91	4.71	4.57	4.41	4.14	3.90	3.08
4.91	4.71	4.57	4.40	4.11	3.75	

These results are provided with this explanation of the color key:

- Green - Instructor did well; if you are at the low end of the spectrum, please continue your efforts to improve.

- Yellow - Instructor should commit themselves to improving your instruction and course management. However, if your course is unusually rigorous and that leads to a lower evaluation score, please continue to place quality over popularity.
- Red - Instructor needs to improve. Instructors in this category must prepare a written self-assessment of their performance in the course along with a goal for the next evaluation and specific strategies/changes to achieve that goal. This plan must be submitted to the Chair and a meeting held to discuss the plan. (none in this review)

Providing the data in this manner allows faculty to compare their performance with others in the department while respecting instructors' privacy. No distinction is made between CM and CEE courses or full-time faculty and part-time instructors.

In addition to routine program assessments, many instructors conduct their own assessments. The results are used to improve course delivery and content, but are not typically shared with other faculty or the Department Chair.

e. Senior Exit Interviews and Surveys

Senior exit surveys and interviews are also important components of program assessment. They provide essential student input on the program, its strengths, weaknesses, and areas of concern. The Department Chair interviews each graduate individually. Students are asked for their input related to all aspects of the program, including coursework, faculty, advising, career guidance, and any other related subject they may wish to raise. The Chair attempts to limit questions to clarification of specific points or as necessary to stimulate a productive conversation. These unstructured, open-ended discussions typically last 30-60 minutes each. Since data collected in this form is subject to bias, there is no attempt to gather quantifiable data. Instead, the Department Chair produces a summary of the interviews that is distributed to the faculty and Dean. The summary focuses primarily on synergistic issues raised by multiple graduates, although a critical issue raised by a single graduate could be sufficient to raise the concern to the faculty. Responses vary by issue, but the faculty attempt to respond to each issue appropriately.

The primary issue raised by the CEM graduates during the Spring 2014 exit interviews was course scheduling; they want more courses at night. This is an important issue that merits careful consideration. While I understand their concerns, it is not clear whether night or day courses are best for the program's growth. Currently, we start out with day classes at the freshman level, then transition our CEM courses to later in the day with the senior level courses all being in the evening.

The Exit Surveys provided more quantifiable information from the graduating students. The results are summarized in the figure below. In general, it shows widespread satisfaction with the CM program. It also shows that students believe that they successfully accomplished the learning objectives established for the program.

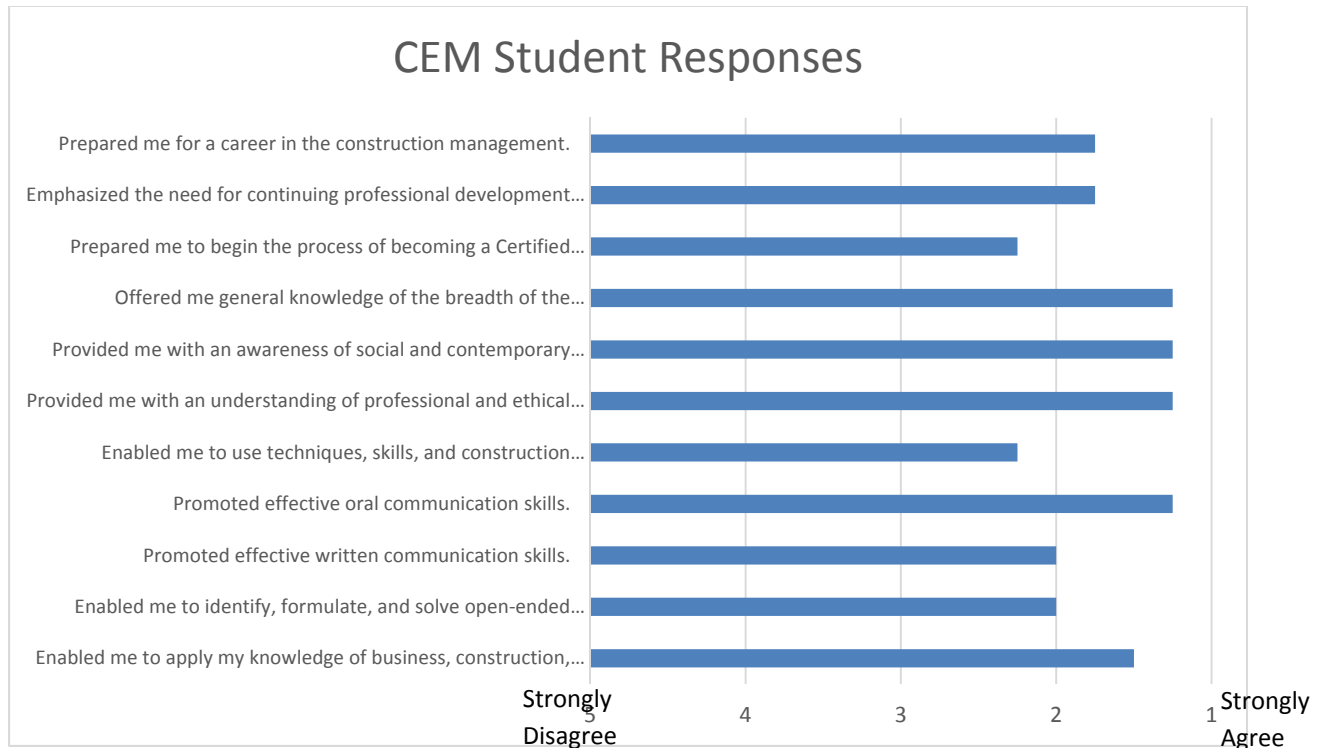


Figure 1. CEM student responses to questions about the CEM curriculum.

5. Actions Taken as a Result of Assessments

Program assessments provide insightful information into the performance of the program and its success in meeting the objectives and learning outcomes. However, this information is only valuable if it is used to modify the program and improve the results. Several specific actions have resulted from our recent assessment efforts.

1. It was determined that one of our Part Time Instructors (PTI) missed a large number of courses due to work commitments (travel) and had a co-worker substitute. We do our best to accommodate our PTIs since the ones in the highest demand are the ones that we really want teaching our students. However, some investigation showed that this had been a growing problem. After some discussion with the instructor, it was decided that it was best for all involved to find a new PTI for that course.
2. As mentioned above, it was determined that AA 267 was not meeting the needs of our program. We have identified a course (ADT 201) at the College of Southern Nevada

(CSN) which serves our needs well. Discussions with CSN and the course instructor showed that the course content is appropriate, the instructor is well qualified to teach REVIT/BIM, and the course has plenty of capacity to accommodate our students. CSN is our local community college partner. While outsourcing a required program course is not ideal, it temporarily satisfies our need until we can find a solution at UNLV.