Annual Assessment Report

for

Construction Science and Management

for the academic year 2013-2014

Prepared by Professor James Goddard

The Program Student Learning Outcomes are based upon GOAL 1: EDUCATIONAL PROGRAM – We will provide an education that will promote a leadership role in construction and prepare the student to become a responsible member of society.

Students will possess the abilities or an understanding of the Program Student Learning Outcomes (PLO's) detailed in the Outcomes below:

Outcome 1. Technical Knowledge Program Learning Outcome – Graduates must be able to apply engineering, science, and math fundamentals to solve construction problems.

Outcome 2. Construction Process Program Learning Outcomes – Graduates shall be able to:

- **2.a.** Understand and analyze the construction process, materials, system assemblies, equipment and requirements.
- **2.b.** Read, understand, and analyze contracts and contractual relationships.
- **2.c.** Develop and prepare quantity take-offs and construct cost estimates.
- **2.d.** Understand and analyze cost control systems.
- **2.e.** Understand and evaluate administrative and operational, and legal aspects of the construction process.
- **2.f.** Compose and revise a project plan and schedule.
- **2.g.** Understand and interpret structural, mechanical, electrical, and plumbing systems.
- **2.h.** Understand and analyze construction safety standards and programs and create a project safety plan.
- **2.i.** Evaluate and interpret construction laws, codes, and regulations.
- **2.j.** Understand material procurement and management.
- **2.k.** Understand and analyze contract documents.
- **2.l.** Understand and select appropriate project delivery systems.

Outcome 3. Communication Program Learning Outcomes – To communicate effectively, graduates shall be able to:

- **3.a** Create appropriate oral presentations.
- **3.b**. Create appropriate written documents.
- **3.c**. Use appropriate graphic depiction.

Outcome 4. Leadership, Management and Teamwork Program Learning Outcome – Graduates shall be able to apply Construction Management skills by effectively working with cross-disciplinary teams.

Outcome 5. Technology Program Learning Outcomes – Graduates shall be able to:

- **5.a.** Apply technology (computers) for analysis and communication.
- **5.b**. Apply technology and instrumentation in field layout.

Outcome 6. Professional Development/Life Long Learning Program Learning Outcome – Graduates shall use self-directed inquiry as a basis for Life-Long Learning.

Outcome 7. Ethics Program Outcomes – Graduates shall be able to analyze and evaluate ethical and professional behavior in preparation for an effective industry career.

The relationship of these program learning outcomes to the university outcomes and assessment are indicated in the Outcomes Matrix Link.

Assessment Methods(s)
Briefly describe the assessment tools, measures, or forms of evidence that will be utilized to demonstrate students' accomplishment of the learning outcomes and who will be assessed.

Assessments and expected level of performance

The ACCE criteria for accrediting construction education programs requires that each program must have an assessment process which documents that their graduates have achieved the educational objectives and program objectives of a quality construction education.

The Program Learning Outcomes (PLO) listed above have been determined by the department faculty and college to satisfy ACCE requirements and are adapted to the context of program learning outcomes for the construction science and management program. Each of the PLO's listed above are measured each semester or annually depending upon the desired data source.

The assessment process utilizes a variety of sources and multiple methods of obtaining data for each of the PLO's. This data is generally collected and evaluated by the faculty on a semester basis to provide a broad base of information relative to performance and achievement of our educational objectives and desired program learning outcomes for the student and graduates. The sources and methods include the following:

Direct Measures

Employer Feedback Surveys – Surveys specific to PLO's are administered to employers recruiting each semester to provide feedback in regard to graduate and internship performance relative to program educational objective and each of the PLO's, as well as other information useful to the department. This survey is conducted by QUALTRICS Survey with notifications sent through email. This information is collected in the spring semester only (once per year).

ACCE Accreditation Review – A national peer review is made every six years by the American Council for Construction Education (ACCE) which establishes national standards for construction education programs. The last review was conducted in October 2009 and the CNSM program received the full 6-year accreditation. The next review will be conducted in 2015. Progress reports are required after one year and three years. During each 6 year accreditation visit, the ACCE Visiting Team also reviews the course materials in detail. This is why we consider the accreditation visit/review as a direct measure of student learning.

Academic Performance and Classroom Assessment – Department faculty are involved in assessing and progressively developing assessment techniques tied to program learning outcomes (Goals) and Course Learning Outcomes (CLO) in specific courses. For each required class in Construction Science and Management the instructor develops a Course Learning Outcomes map linking to the specific PLO's such that attainment of specific PLO's can be measured each semester by course work and performance in class. This information is collected in the Instructor Course Learning Outcome Report each semester that a course is taught.

Indirect Measures

Alumni Surveys – The program uses two (2) Alumni Surveys to collect assessment data from Alumni (2 yrs and 5 yrs after graduation). These surveys are very program specific and allows us to evaluate the input from two and five year alumni in the context of the PLO's. These surveys directly address the PLO and provide a reliable measure of attainment of PLO's because of the focus of the alumni on the construction professional and attainment of the Educational Program Objective. These surveys are conducted by QUALTRICS Survey with notifications sent through email. This information is collected in the spring semester only (once per year).

Construction Science and Management Industry Advisory Council – The 12 members of the advisory council come from all facets of the construction industry and serve at the executive level within their companies. The council convenes each semester to provide valued feedback and input for program improvement and department support. Specifically, the council provides input in establishing departmental goals and plans, program objectives and learning outcomes, and curriculum/course content. They review our assessment data results in the Fall meeting and give their recommendations each year. The program learning outcomes are reviewed and course learning outcomes are reviewed on a rotating basis.

Graduating Senior Exit Survey – All seniors are required to fill out an exit survey prior to graduation which addresses their self assessment of achievement for the Program Learning Outcomes. The Senior Exit Survey is administered every semester in the senior capstone class CNS 660 Construction Operations. Each of the PLO's are "mapped" to one or more questions in the survey to provide data specific to the PLO.

Employment Opportunities – The department actively follows employment opportunities of graduating seniors as well as summer employment, internships and co-op learning experiences to help measure application of learning. This measure gives a general indication of the marketability of the learning that has been accomplished.

Results ***The summary of data related to the prior-set student achievement goals.***

Identify how many students were assessed, student achievement relating to minimum competency expectations, (if possible student achievement indicators relating to proficient and/or exceptional levels)

Results for assessment 1 and what was learned from the results.

The CNSM Program Assessment Committee (PAC) met in October of 2014 to review the spring 2014 assessment results from the survey documents. The assessment results indicated that the Program Educational Objective and all of the PLO's were generally being achieved at a highly satisfactory level. (1=Unacceptable, 3=Adequate, 5=Exemplary).

1. The CNSM PAC established the performance criteria at 3.50 for All Assessments and 3.75 for Key Assessments for all objectives. Results of the spring 2014 assessment resulted in all outcomes meeting these increased performance criteria with the exception of Outcome 3b. During a prior assessment cycle ending in the spring of 2011, the committee noted that Outcome 3b, "Communication with Written Documents" fell below the performance criteria of 3.75 for Key Assessments. Steps were taken to place a greater emphasis on written communications in the program's classes. The assessment cycles of 2012 and 2013 returned improved results for the outcome. However, for this cycle the performance again fell below the performance criteria of 3.75 for the Key Assessments for the 2013-2014 cycle.

   The faculty discussed this situation and reviewed the data in more detail. The cause of the lower score was not specifically determined, however, several factors are possible. One factor is the apparent lack of preparation of basic writing skills at the remedial levels of education. Secondly, students take the Expository Writing courses early in their college education, many taking them while in high school, and simply are out of practice in using this skillset. Another way for an individual to improve writing skills is through reading. Introduction of more reading requirements may be one way to improve students writing abilities. In addition, the courses taught within the program may not be requiring students to exercise these skills to the extent required to improve their abilities.

Therefore, the CNSM PAC must work with the faculty to increase and improve the written communication exercises in each program course no matter what the level of the course. See Actions and Revisions Implemented discussed below.

2. As indicated in the 2011-2012 assessment report, the CNSM PAC conducted a survey requesting from alumni and industry representatives both thoughts and suggestions on updating the program and revising to better match the industry's needs resulting from changes in technology and management techniques. This information was been collected and reviewed to determine positive revisions in the program which might begin in the fall of 2014. This program began in the fall of 2014, however, many of the new courses will not be implemented until the fall 2014 class reaches the level in the program where the courses will be taught.

To summarize, none of the outcomes were serious items to address at this point. Only the data analyses for the Written Communication outcome was borderline between "outcome achieved" and "potential concern." The CNSM PAC has monitored the data trends for other PLO's and thus far has not found any on-going concerns.

The results of our assessment efforts, using the assessment survey instruments and methods described above, produced the following data tabulated for eleven (11) primary PLO's as follows: The assessment results specific to our PLO's are included for 2013- 2014 cycle in the attached document.

The assessment results specific to our SLO's are as follows for 2013- 2014

(1=Unacceptable, 3=Adequate, 5=Exemplary).

Assessment	**SLO Assessment Score *(1) Unacceptable to (5)Exemplary***											**Program Educational Object**
Survey	**1a**	**2a-l**	**3a**	**3b**	**3c**	**4a,b**	**5a**	**5b**	**6a**	**6b**	**7a**	
Senior Survey	*4.21	4.22	4.39	3.92	4.25	4.15	5.78	3.43	4.05	4.14	4.33	*4.29
2yr Alumni Survey	*4.35	3.97	3.92	4.08	4.17	4.00	4.26	*3.91	4.17	3.96	*4.46	4.28
5yr Alumni Survey	4.00	*3.74	*3.78	4.00	3.67	3.69	*3.67	N/A	*3.75	*3.63	*3.78	4.14
Employer's Survey	*4.34	*3.92	3.71	*3.66	*3.86	*3.89	*4.29	3.91	*3.85	*3.67	*4.26	*4.20
Instructors Survey	3.86	*3.81	*4.00	*3.63	*3.90	*3.75	4.00	*4.00	5.00	4.00	3.63	*4.00
Average Key Measure Scores	**4.30**	**4.01**	**3.89**	**3.64**	**3.88**	**3.82**	**3.98**	**3.96**	**3.80**	**3.65**	**4.17**	**4.31**
University SLO's	**U1,2**	**U1**	**U3**	**U3**	**U3**	**U2**	**U1**	**U1**	**U4**	**U4**	**U5**	

[Data collected Fall 2013 and Spring 2014]
[*Key measures]

Faculty Review of Annual Assessment Data

Describe the process by which the program faculty reviewed the results and decided on the actions and/or revisions that were indicated by those results.

The CNSM PAC met October of 2014 to review the spring 2014 assessment results from the survey documents. The assessment results indicated that the Program Educational Objective and all of the SLO's were generally being achieved at a highly satisfactory level. (1=Unacceptable, 3=Adequate, 5=Exemplary).

The CNSM PAC found that the 2011-2012 and 2012-2013 scores for program SLO Item 3b had rebounded to an acceptable level from 2010-2011 but the assessment results from the 2013-2014 data indicates some problems may again exist. The committee decided to continue to track

this item as it is critical to both the academic performance of the student and the job performance of the graduate. See Actions and Revisions Implemented described below.

To summarize, none of the outcomes were serious items to address at this point. All of the data analyses for the outcomes listed above were at the "outcome achieved" level and no current concerns were expressed. The committee decided to observe the data over another assessment cycle.

As stated earlier, the Construction Science and Management program is accredited by the American Council for Construction Education (ACCE). All SLOs are assessed annually. In addition, during each 6 year accreditation cycle visit, the ACCE Visiting Team also reviews the course materials in detail. This is why we consider the accreditation visit/review as a direct measure of student learning.

Actions and Revisions Implemented

Describe the actions and/or revisions that were implemented in response to the assessment results.

a) The Department CNSM PAC met in August of 2011 and identified program courses that should include the oral/written communication component as the actual performance results did not meet the established performance criteria. The oral/written communication assignments were reviewed for each course. The CNSM PAC determined that each of the assignments had adequate quality content to meet this requirement. This assessment has been measured annually for spring course offerings within the department. The CNSM PAC had agreed to monitor the courses containing Written Communications and Oral Communications to assure the level of application in these areas did not denigrate. The results greatly improved in the 2011-2012 and 2012-2013 assessment data results. As indicated above, the evaluation results for the 2013-2014 assessment cycle again fell for the Written Communication.

The faculty teaching terminal courses required for the major are polled as to their personal evaluation of the communication ability of the graduating senior and, of course, their oral/written communication preparation for these terminal courses. The most important course for which this evaluation is measured is the capstone course for the program. However, preparatory course work in written communication assignments are critical here.

As stated above, many factors contribute to low or high results. The faculty have agreed to ensure that written assignments are assigned and reviewed in the lower courses in the program. A major effort will be to improve the writing skills here. The CNSM PAC again will closely monitor the results in the next cycles as written communication skills are critical to both the academic performance of the student and the job performance of the graduate.

b) The new course implementations and existing course revisions will begin to occur in the next assessment cycle. These will be closely observed to ensure high achievement of the students.

c) As it has been since the initiation of the program's assessment process, the largest assessment implementation problems appear at the course outcomes level. The CNSM PAC will emphasize the use of Bloom's taxonomy and better major assignment grading rubrics that define the student accomplishment of a task. Many are using proper methods but a few are still struggling with the process. The CNSM PAC will provide assistance with many of the questions that arise.