University of Arkansas at Little Rock

DONAGHEY COLLEGE OF ENGINEERING AND INFORMATION TECHNOLOGY

DEPARTMENT OF CONSTRUCTION MANAGEMENT AND CIVIL AND CONSTRUCTION ENGINEERING

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ASSESSMENT REPORT

Assessment Report for the Construction Management Degree Program

June 2015

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This report summarizes the results of the 2015 assessment cycle for the Construction Management degree program. In addition to serving as the annual assessment report for the degree program, this report specifically address items 3.1.5.1, 3.1.5.3, 3.1.5.4.D, 3.1.5.4.K and 9.1.5.2 in the 2015 ACCE Self-Study.

Because UALR is participating as a pilot program and is one of the first programs to seek reaccreditation under ACCE's new outcome-based standards, ACCE granted approval to submit a supplemental assessment report prior to July 15, 2015 in order to incorporate data from the Spring 2015 semester.

The Change to Outcome Based Standards

In July 2014, the American Council for Construction Education approved Document 103, Standards and Criteria for Accreditation of Postsecondary Construction Education Degree Programs. These new standards were several years in development and represent a dramatic shift away from prescriptive standards for accreditation to outcome based or performance standards. These standards become mandatory for ACCE accreditation in 2016.

The UALR Construction Management degree program was eligible to apply for reaccreditation in 2015 under the old standards. However, under the leadership of Chair J. Michael Tramel, it was determined that the program should be one of several pilot programs to voluntarily seek early accreditation under the new outcome based standards. In September 2015, **the UALR Construction Management degree program is scheduled to be the very first program to receive a visit from an ACCE team for review under the new standards**.

UALR Response to New ACCE Criteria

Outcome based standards give new flexibility to the degree program in the number and structure of courses offered. Many prescriptive requirements are removed. However, under the new standards, the degree program is required to greatly expand assessment in coursework and other indirect measurements to demonstrate achievement of both program objectives and learning outcomes. Tremendous effort was expended to design a Quality Improvement Plan (QIP) that incorporates all components required under new ACCE standards including methods of assessment for both learning outcomes and program goals, a strategic plan, defined assessment cycle and a plan for reporting assessment results and actions taken. The QIP is included in Appendix C of the self-study.

Program Approach to Assessment

"How does one eat an elephant?" The answer of course, is one piece at a time. Assembling an effective QIP is a massive, continuous effort. The UALR Construction Management QIP was compiled based on best practices and in collaboration with other construction degree programs via ACCE sponsored workshops and reviews. ACCE established twenty mandatory learning outcomes. The program adopted these outcomes as part of the assessment of the degree program. ACCE requires direct measures, such as exams or embedded course assignments for all learning outcomes and recommends indirect measures such as surveys. Performance levels may be set by the program, but must be supported by data. Programs must also assess progress on program objectives and mission. These include the non-learning objectives of the program that are typically outlined in a strategic plan. ACCE requires that both the degree program and the education unit containing the degree program operate under a strategic plan.

Assessment of Student Learning Outcomes

One of the first decisions to make regarding assessment of learning outcomes was the assessment cycle. Twenty is a very large number of learning outcomes. ACCE "best practices" were used as a guide in development of the assessment process. It is not necessary to assess all twenty learning outcomes annually. It is necessary to have an assessment cycle that will allow all learning outcomes to be assessed within the normal six year accreditation cycle. Consequently, the program designed an assessment schedule to assess all learning outcomes in a five year period. ACCE requires that learning outcomes be assessed by at least one direct measure such as course assignments or exams and encourages the use of indirect measures such as surveys.

ACCE has long promoted The Associate Constructor (AC) exam of the American Institute of Constructors (AIC) for assessment of degree programs. Students in the program had a pass rate of 50% compared to the national average of 48% for the March 2015 test day. Best practices suggest that the AC exam can be used as a direct or indirect measure of learning outcomes as well. An ACCE study group has mapped sections of the exam to specific learning outcomes. A breakdown of the AC exam by section is available for program assessment. ACCE continues to work with AIC to refine the AC exam as an assessment tool. The program incorporated the appropriate sections of the AC exam as both direct and indirect assessments for appropriate learning outcomes. The program uses surveys of graduating seniors, alumni and employers as other indirect methods to assess learning outcomes.

ACCE requires a mapping of course learning outcomes and other assessment tools to the twenty learning outcomes. The program has adopted a learning outcome assessment map that clearly shows the assessment on a course basis as well as how learning outcomes are assessed with the AC exam and surveys of stakeholders. The assessment map clearly defines the assessment cycle. The assessment map is included in Appendix C of the self-study.

The five-year assessment cycle is shown in the learning outcomes table on page 4. **Learning outcomes 3, 4, 5 and 19 are the only learning outcomes were assessed in the 2015 cycle**.

Learning Outcome Five-Year Assessment Cycle	
Learning Outcome	Assessment Year
1. Create written communications appropriate to the construction discipline	2016
2. Create oral presentations appropriate to the construction discipline	2016
3. Create a construction project safety plan	**2015**
4. Create construction project cost estimates	**2015**
5. Create construction project schedules	**2015**
6. Analyze professional decisions based on ethical principles	2018
7. Analyze construction documents for planning and management of construction processes	2017
8. Analyze methods, materials, and equipment used to construct projects	2019
9. Apply construction management skills as a member of a multi-disciplinary team	2019
10. Apply electronic-based technology to manage the construction process	2019
11. Apply basic surveying techniques for construction layout and control	2017
12. Understand different methods of project delivery and the roles and responsibilities of all constituencies involved in the design and construction process	2019
13. Understand construction risk management	2016
14. Understand construction accounting and cost control	2018
15. Understand construction quality assurance and control	2017
16. Understand construction project control processes	2018
17. Understand the legal implications of contract, common, and regulatory law to manage a construction project	2016
18. Understand the basic principles of sustainable construction	2017
19. Understand the basic principles of structural behavior	**2015**
20. Understand the basic principles of mechanical, electrical and piping systems	2018

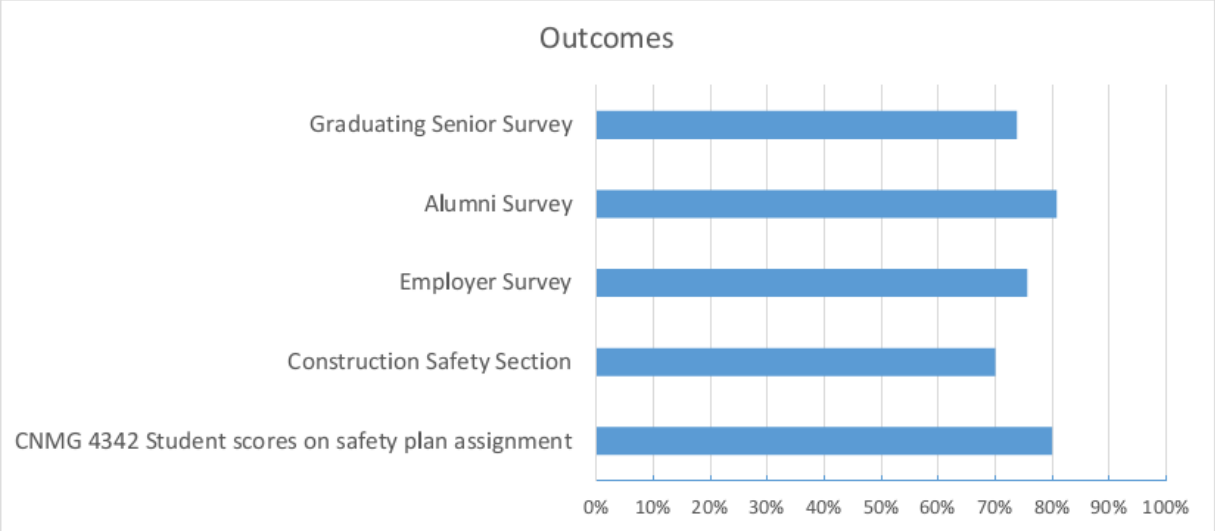
Analysis and Actions Taken as a Result of Learning Outcomes Assessment
Analysis shows that students meet each of the four learning outcomes assessed in the 2015 cycle. The following four exhibits summarize and validate the assessment claims in a clear and systematic manner.

For each learning outcome, a summary of the assessment instrument and means are provided. Conclusions and actions to be taken are summarized.

The overall results of the assessment of learning outcome was positive. In each case the action to be taken is to continue to monitor student performance on the AC examination.

The QIP included in Appendix C of the self-study clearly shows that the results obtained from the formal assessment of the Student Learning Outcomes have been included as part of the construction unit's quality improvement plan. Since this is the first cycle of outcome based assessment, no follow up on the results of the actions taken is available at this time.

SLO 3 Create a construction project safety plan				
Assessment Tools	Performance Indicator	Type of Assessment	Performance Criteria	Outcomes
Course Learning Outcomes (CLO's)	CNMG 4342 Student scores on safety plan assignment	Direct	70%	80%
AC Exam	Construction Safety Section	Indirect	70%	70%
Outcome Surveys	Employer Survey	Indirect	70%	76%
	Alumni Survey	Indirect	70%	81%
	Graduating Senior Survey	Indirect	70%	74%



Summary

The performance criteria were exceeded or met in all areas. It is particularly noteworthy that student performance met the criteria for the Associate Constructor Exam. There is close agreement on all assessment measures employed in the assessment of the Student Learning Outcome (SLO). The Course Learning Outcome (CLO) was employed as a direct measure of the SLO. The AC exam and surveys of graduating seniors, alumni and employers are indirect indicators of performance.

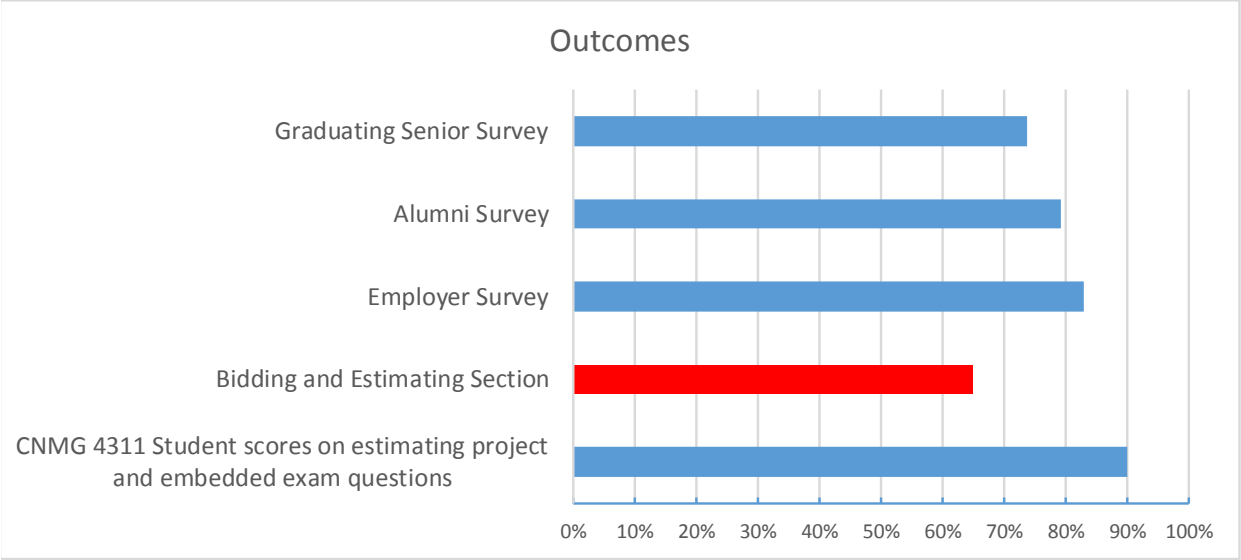
Action Taken

Although the 70% results meet the performance criteria established for the Construction Safety section of the AC exam, it would be desirable to improve scores of students in this area. CNMG 4145 Professional Constructor Certification was added to prepare students for the AC exam. The review mechanism is in place. Student performance on the appropriate section of the AC exam will be monitored. No additional action will be taken at this time.

Conclusions

The assessment data validates the students graduating from the UALR Construction Management program meet SLO 3 - Create a construction project safety plan.

SLO 4 Create construction project cost estimates				
Assessment Tools	Performance Indicator	Type of Assessment	Performance Criteria	Outcomes
Course Learning Outcomes (CLO's)	CNMG 4311 Student scores on estimating project and embedded exam questions	Direct	70%	90%
AC Exam	Bidding and Estimating Section	Indirect	70%	65%
Outcome Surveys	Employer Survey	Indirect	70%	83%
	Alumni Survey	Indirect	70%	79%
	Graduating Senior Survey	Indirect	70%	74%



Summary

The performance criteria were exceeded or met in most areas. Student performance was slightly below the performance criteria for the Associate Constructor Exam. However, the AC exam results are used as an indirect assessment since the nature of the exam does not allow students to actually create a construction estimate. The most significant assessment tool was the direct assessment performed in CNMG 4311 Estimates II. Students met the performance criteria for this direct assessment. Surveys of graduating seniors, alumni and employers all exceed performance criteria for the Student Learning Outcome (SLO). The Course Learning Outcome (CLO) was employed as a direct measure of the SLO. Surveys of graduating seniors, alumni and employers are other indirect indicators of performance.

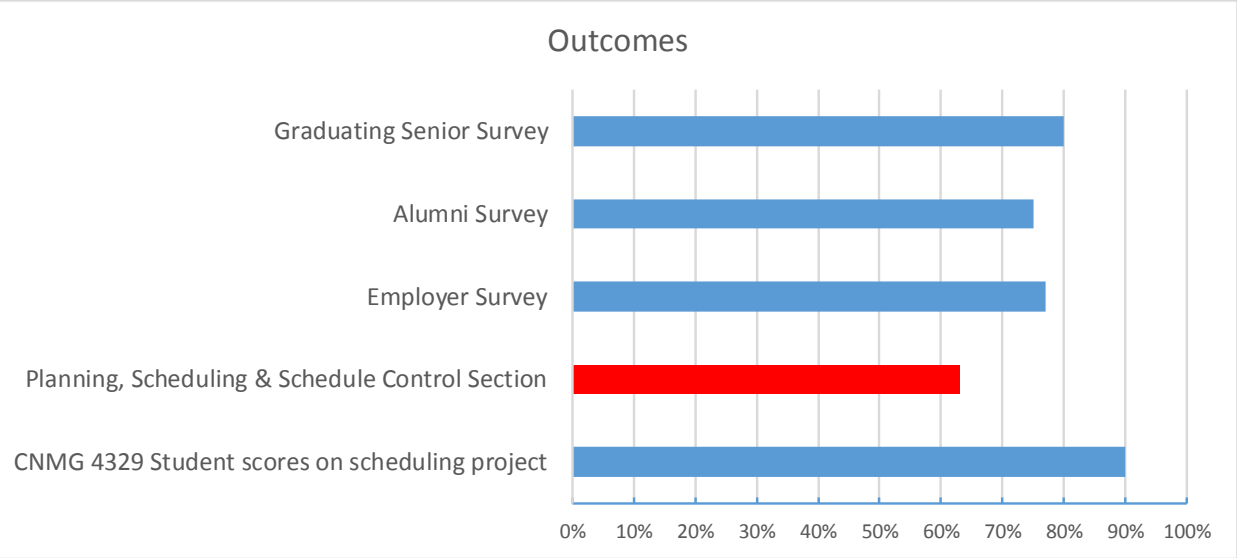
Action Taken

It would be desirable to improve scores of students in the Bidding and Estimating section of the AC exam. CNMG 4145 Professional Constructor Certification was added to prepare students for the AC exam. The 65% result is very close to the performance criteria of 70%. The review mechanism is in place. Student performance on the appropriate section of the AC exam will be monitored. No additional action will be taken at this time.

Conclusions

The assessment data validates the students graduating from the UALR Construction Management program meet SLO 4 - Create construction project cost estimates.

SLO 5 Create construction project schedules				
Assessment Tools	Performance Indicator	Type of Assessment	Performance Criteria	Outcomes
Course Learning Outcomes (CLO's)	CNMG 4329 Student scores on scheduling project	Direct	70%	90%
AC Exam	Planning, Scheduling & Schedule Control Section	Indirect	70%	63%
Outcome Surveys	Employer Survey	Indirect	70%	77%
	Alumni Survey	Indirect	70%	75%
	Graduating Senior Survey	Indirect	70%	80%



Summary

The performance criteria were exceeded or met in most areas. Student performance was slightly below the performance criteria for the Associate Constructor Exam. However, the AC exam results are used as an indirect assessment since the nature of the exam does not allow students to actually create a construction project schedule. The most significant assessment tool was the direct assessment performed in CNMG 4329 Construction Planning and Scheduling. Students met the performance criteria for this direct assessment. Surveys of graduating seniors, alumni and employers all exceed performance criteria for the Student Learning Outcome (SLO). The Course Learning Outcome (CLO) was employed as a direct measure of the SLO. Surveys of graduating seniors, alumni and employers are other indirect indicators of performance.

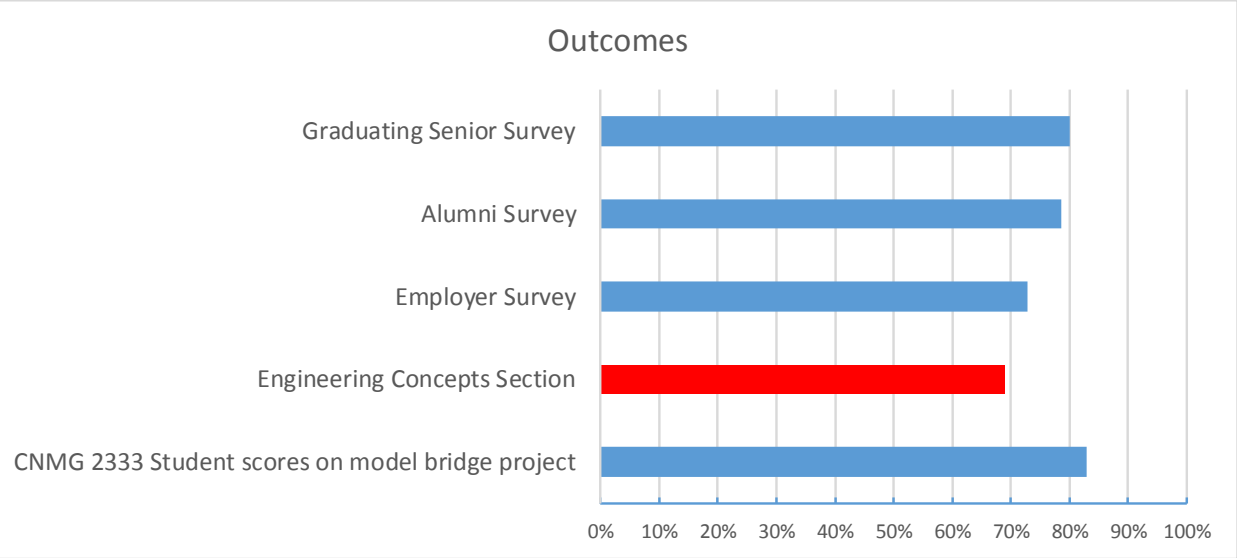
Action Taken

It would be desirable to improve scores of students in the Planning, Scheduling and Schedule Control section of the AC exam. CNMG 4145 Professional Constructor Certification was added to prepare students for the AC exam. The 63% result is very close to the performance criteria of 70%. The review mechanism is in place. Student performance on appropriate section of the AC exam will be monitored. No additional action will be taken at this time.

Conclusions

The assessment data validates the students graduating from the UALR Construction Management program meet SLO 5 - Create construction project schedules.

SLO 19 Understand the basic principles of structural behavior				
Assessment Tools	Performance Indicator	Type of Assessment	Performance Criteria	Outcomes
Course Learning Outcomes (CLO's)	CNMG 2333 Student scores on model bridge project	Direct	70%	83%
AC Exam	Engineering Concepts Section	Direct	70%	69%
Outcome Surveys	Employer Survey	Indirect	70%	73%
	Alumni Survey	Indirect	70%	79%
	Graduating Senior Survey	Indirect	70%	80%



Summary

The performance criteria were exceeded or met in most areas. Student performance was slightly below the performance criteria for the Associate Constructor Exam. The AC exam results are used as a direct assessment. The other significant assessment tool was the direct assessment performed in CNMG 2333 Statics and Strength of Materials. Students met the performance criteria for this direct assessment. Surveys of graduating seniors, alumni and employers all exceed performance criteria for the Student Learning Outcome (SLO). The Course Learning Outcome (CLO) and the AC exam were employed as a direct measures of the SLO. Surveys of graduating seniors, alumni and employers are indirect indicators of performance.

Action Taken

It would be desirable to improve scores of students in the Engineering Concepts section of the AC exam. CNMG 4145 Professional Constructor Certification was added to prepare students for the AC exam. The 69% result is very close to the performance criteria of 70%. The review mechanism is in place. Student performance on appropriate section of the AC exam will be monitored. No additional action will be taken at this time.

Conclusions

The assessment data validates the students graduating from the UALR Construction Management program meet SLO 19 - Understand the basic principles of structural behavior.

Assessment of Program Goals and Objectives

The program operates within a strategic plan for program (non-learning) objectives. The strategic plan and the cycle and tools for assessment of the strategic plan are included in Appendix C of the self-study. The cycle for assessment of program goals is shown below.

Program Goals Three-Year Assessment Schedule	
Program Objective	Assessment Report
1. Provide degree programs responsive to the needs of the construction industry and potential students in the program.	
a. Recruit and retain appropriate full and part-time faculty and staff for teaching, research, service learning, and industry support.	**2015**
b. Deliver course offerings via a combination of face-to-face, hybrid and distance learning methods to meet the needs of students and industry.	2016
c. Maintain appropriate academic accreditations.	2016
d. Maintain the Department's relationships with industry.	2017
2. Recruit and retain students who have the interest and aptitude to succeed in their chosen program of study in construction or engineering.	
a. Maintain the Department's reputation for fostering a "student friendly" environment, responsive to students' needs and concerns, where students are encouraged to interact with staff and faculty at all times	**2015**
b. Increase donations for Construction Management scholarship funds.	2016
3. Deliver curriculum responsive to the needs of industry and students in the 21st Century.	
a. Determine appropriate levels of technology for the educational programs.	**2015**
b. Develop appropriate methods of instructional delivery for student success.	2016

Progress toward three objectives and goals was assessed in 2015. The three following exhibits summarize the assessment of program goals and objectives and the actions taken. In each of the items assessed the conclusion was that the program is meeting the performance criteria.

Program Goal 1, Objective a.

1. Provide degree programs responsive to the needs of the construction industry and potential students in the program.

    a. Recruit and retain appropriate full and part-time faculty and staff for teaching, research, service learning, and industry support.

        i. Execution – Utilize budgeted funds for a blend of full and part-time faculty capable of providing the services required. Balance programming with available financial resources.

        ii. Resources Needed – Faculty and staff budget lines.

        iii. Performance Criteria – Ability to deliver the desired instructional courses with the desired frequency.

        iv. Assessment Method – Were needed faculty hired?

        v. Assessment Period – Spring 2015

Summary – Two faculty were hired. Dr. Lashun Thomas teaches in the Civil and Construction Engineering program and is the coordinator of the Environmental Engineering program. Dr. Hollis Bray teaches in both the Construction Management program and the Civil and Construction Engineering program. Dr. Bray provided needed expertise in the transition to outcome based assessment and was able to teach six different courses in two semesters, providing the necessary flexibility to offer the instructional courses necessary. In addition, Dr. Bray has strengthened ties to industry with the Arkansas Ready Mixed Concrete Association, the Arkansas Chapter of the American Concrete Institute and the AGC of Arkansas. Dr. Bray will teach the seven-part Lean Construction course for AGC in Fall 2015.

An institutional study provided by the Provost identified the potential for expanding course and degree offerings online. This will require an additional faculty member.

Action Taken – Two faculty members were hired and the department has requested an additional full time faculty member to assist in the offering and development of online content.

Conclusion – The department has successfully used the available support to meet the objective "Recruit and retain appropriate full and part-time faculty and staff for teaching, research, service learning, and industry support" in support of Program Goal 1.

Program Goal 2, Objective a.

2. Recruit and retain students who have the interest and aptitude to succeed in their chosen program of study in construction or engineering.
    a. Maintain the Department's reputation for fostering a "student friendly" environment, responsive to students' needs and concerns, where students are encouraged to interact with staff and faculty at all times
        i. Execution - Strengthen student organizations by increasing participation student chapter professional organizations.
        ii. Resources Needed – Appropriate faculty load to support advising student organization, support of industry with time and money.
        iii. Performance Criteria – Number of student participants and organization events.
        iv. Assessment Method – Were faculty assigned as student organization advisors and report of student participation
        v. Assessment Period – Spring 2015

Summary – The UALR Construction Management program has five student chapters and one honor society for student involvement with adequate faculty support. The student chapters are affiliated with the Associated General Contractors, the Associated Builders and Contractors, the National Association of Home Builders, Society of Women Engineers, American Society of Civil Engineers, National Association of Women in Construction, and the American Subcontractors Association. Twenty students regularly participate in student activities. Last year the Construction Management program received an award for "Honoring Graduation & Retention Advocacy". This is a new program based on student success and retention that has been in place for three years. The Chair has won an individual award for all three years that the program has been in place. The administrative assistant has won for two years.

Action Taken – The program will continue to expand opportunities for students to interact with faculty and industry professionals. An ACI student chapter will be formed. Students will have the opportunity to complete the ACI Field Testing Technician and Flatwork certifications.

Conclusion – The department has successfully used the available support to meet the objective "Maintain the Department's reputation for fostering a "student friendly" environment, responsive to students' needs and concerns, where students are encouraged to interact with staff and faculty at all times " in support of Program Goal 2.

Program Goal 3, Objective a.

3. Deliver curriculum responsive to the needs of industry and students in the 21st Century

    a. Determine appropriate levels of technology for the educational programs.

        vi. Execution – Survey of industry and peer programs.

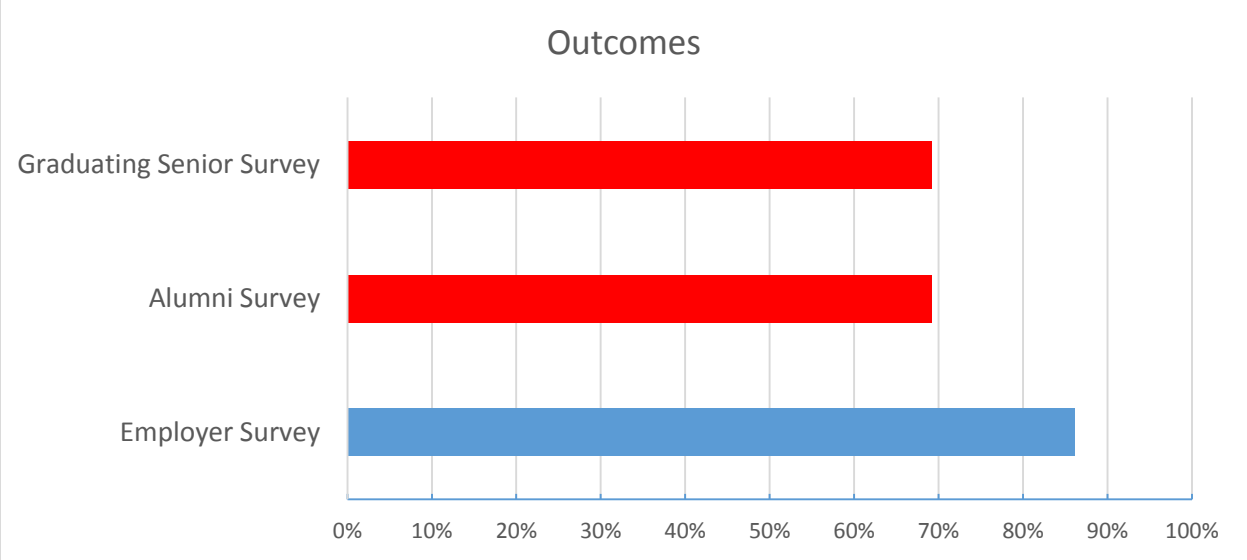
        vii. Resources Needed – Administrative time.

        viii. Performance Criteria – Analysis of technology survey completed.

        ix. Assessment Method – Survey

        x. Assessment Period – Spring 2015

Assessment Tools	Performance Indicator	Type of Assessment	Performance Criteria	Outcomes
Outcome Surveys	Employer Survey	Indirect	70%	86%
	Alumni Survey	Indirect	70%	69%
	Graduating Senior Survey	Indirect	70%	69%



Action Taken – None at this time.

Conclusion – The survey results are very close to the performance criteria. The Department has received substantial return of student technology fees in the last several years.

- 2012-13: $48,872
- 2013-14: $31,710
- 2014-15: $45,745

In 2015, the College adopted a new policy officially stating that 50% of tech fees will continue to be distributed to the departments. This should assure that these supplemental funds will continue to be available. There is general support among constituencies that the program is utilizing appropriate levels of technology in the curriculum in support of Program Goal 3.