2014 Annual Assessment Report and Action Plan
Construction Engineering Management Program

Results of surveys from 19 to 24 graduating seniors, 19 alumni from the class of 2009, 12 alumni from the class of 2012, and 29 employers were reviewed by CEM faculty and the CEM Industry Advisory Committee of the CCE Industry Advisory Board. The surveys of graduating seniors were conducted by EBI for June 2014 graduates. The surveys of alumni and employers were conducted by the CCE School in May 2014. The following strengths and weaknesses were noted:

Strengths:

1. Overall customer satisfaction remains high:
    a. Average scores for 20 respondents to the senior exit survey for "The Bottom Line – Overall Evaluation – Extent that the undergraduate engineering program experience fulfilled expectations" was 5.8 on the 7.0 scale, exceeding the target minimum score of 4.9. This was the second highest score for CEM since the conversion to EBI surveys in 2007.
    b. Eleven of twelve 2012 graduates responding to the alumni survey were very satisfied or moderately satisfied with the educational preparation received in the OSU CEM program (1 neutral respondent). Average score was 6.2 on the 7-point scale.
    c. Nineteen of nineteen 2009 graduates responding to the alumni survey were very satisfied or moderately satisfied with the educational preparation received in the OSU CEM Program. Average score was 6.3 on the 7-point scale.
    d. After throwing out very dissatisfied responses from three respondents because their other responses were very positive (indicating a misinterpretation of the question), all remaining respondents to the employer survey reported that they were very satisfied (17) or moderately satisfied (12) with the "average recent OSU CEM graduate's educational preparation." Average score was 6.6 on the 7-point scale.
    e. In 2014, graduating seniors in CEM scored their "Overall Program Effectiveness" 5.8 of 7, fifth highest of 16 College of Engineering (COE) Programs. They scored "Overall Learning" 5.8 of 7, eight highest of 16 COE Programs. They scored "Overall Satisfaction" 5.9 of 7, seventh highest of COE programs.
2. Achievement of CEM Program Student Outcomes remains high:
    a. Average scores for graduating seniors for 17 of 17 Student Outcomes exceeded the target minimum of 4.9 on the 7.0 scale.
    b. For alumni from the 2009 graduating class, average scores for 15 of 17 Student Outcomes exceeded the target minimum of 4.9 on the 7.0 scale.

Nineteen alumni responded to the survey. "Ability to design a system, component or process" was scored 4.8 and "understand contemporary issues, including public policy" was scored 4.7.

c. For alumni from the 2012 graduating class, average scores for 15 of 17 Student Outcomes exceeded the target minimum of 4.9 on the 7.0 scale. Twelve alumni responded to the survey. "Understanding impact of engineering solutions in a global/societal context . . ." was scored 4.9, the target minimum. "Understand contemporary issues . . ." was scored 4.8.
d. Average scores from 29 employers for 16 of 17 Student outcomes exceeded the target minimum of 4.9 on the 7.0 scale. Like the alumni from the 2009 and 2012 graduating classes, "Understand contemporary issues . . ." did not meet the minimum. The average score was 4.7.

Weaknesses:

1. Alumni from 2009 and 2012, and employers on average, rated Student Outcome J, "Understanding contemporary issues, including public policy" below 4.9 on the 7-point scale. Scores were 4.7, 4.8, and 4.7 respectively. These scores are only slightly below the target minimum score of 4.9, but this is considered a weakness.
2. Alumni from the class of 2009, on average, rated their preparation for Student Outcome C, "Ability to design a system, component, or process," at 4.8 on the 7-point scale. This is below the target minimum score of 4.9.

Summary and Action Plan: (After Discussion with IAC, October 31, 2014 and with CEM Faculty Dec. 18, 2014)

1. Weakness 1 – preparation for "Understanding contemporary issues, including public policy": This is one of the ABET a)-q) outcomes adopted by the CEM Program around the turn of the century for consistency across the CCEE Department. After 2014, the CEM Program will be working toward 20 outcomes defined by ACCE that will not include this outcome. **The CEM Program recommends that this outcome not be retained when the 20 new ACCE Student Outcomes are implemented. Consequently, no action is required.**
2. Weakness 2 – "Ability to design a system, component, or process.": This is one of the ABET a)-q) outcomes adopted by the CEM Program around the turn of the century for consistency across the CCEE Department. After 2014, the CEM Program will be working toward 20 outcomes defined by ACCE that will not include this outcome. **The CEM Program recommends that this outcome not be retained when the 20 new ACCE Student Outcomes are implemented. Consequently, no action is required.**
3. The response of only 12 alumni from the class of 2012 (from a class of approximately 70 graduates) is a cause for concern. **Forming a Linked-in group for graduating CEM seniors each year is a possible method for improving response that may be attempted. If response rates are not better for future alumni surveys, other methods of outcomes assessment must be considered.**
4. The response to the senior exit survey of only 19 – 24 graduating seniors is a concern. Should CEM also take back the senior exit survey from EBI as it has done with alumni and employer surveys, particularly since the new 20 ACCE Student Outcomes will all be "write-in" outcomes and they will still receive the ABET a-q questions in the EBI survey anyway, making unnecessary work for the graduating seniors?
5. Before the 2015 assessment cycle, senior exit, alumni, and employer surveys must be rewritten to assess the 20 new ACCE student outcomes. At the same time, **the "planning and scheduling" question should be replaced with "knowledge of scheduling basics and ability to work with scheduling software such as P6," in the alumni and employer surveys.** If item #4 above results in CEM administering the senior exit survey too, that survey should be written to conform to the newly developed employer and alumni surveys.
6. **Weaknesses and Concerns from the 2014 ACCE visiting team must be addressed in the first annual report.**

7. Follow-up on Item 8 from 2013 assessment action plan – **If students are not receiving an exercise in processing a submittal, find a place to introduce one and introduce it.**
8. **All individual course learning objectives should be mapped to the new 20 ACCE Student Learning outcomes to assure that the current curriculum adequately addresses the outcomes.** Tom Miller's document for the CE Program and ABET Outcomes, available on the O drive in the ABET folder, provides a good example of how to do this. **If the current curriculum does not address the new outcomes, curricular changes should be considered.**
9. As the new COE Strategic Plan takes shape, determination should be made as to whether there will be CCE and CEM strategic plans consistent with it. **The resulting strategic plan should be checked against the ACCE Standard** in Document 103, Section IX at http://www.acce-hq.org/accreditation_process/accreditation-procedures/ .
10. **See Appendix B, 2013 action items 4 and 14 regarding planned action to require CEM 431, Obtaining Construction Contracts, for all CEM majors.**

Appendix A: Summary of 4 Surveys from 2014

2014 Assessment Cycle

2014 Employers, 2014 Graduates, 2012 Alums in 2014, and 2009 Alums in 2014

Scale of 1 - 7. Target Minimum Score of 4.9

	Evaluation of Preparation by . . .				Evaluation of Importance by . . .			Preparation minus importance		
	Employers (32)	2014 Class (19-21)	2012 Class (13)	2009 Class (19)	Employers (32)	2012 Class (13)	2009 Class (19)	Employers (32)	2012 Class (13)	2009 Class (19)
THE 17 Outcomes (a - q)										
Ability to apply mathematics, science and engineering -- Outcome a	6.2	5.9	6.2	5.8	6	5.5	5.4	0.2	0.7	0.4
Ability to design and conduct experiements (b)	6	5.5	5.3	5.5	5.3	4.5	4.9	0.7	0.8	0.6
Ability to design a system, component, or process - c	5.2	5.7	5.3	4.8	4.8	4.4	4.7	0.4	0.9	0.1
Able to function on multi-discliplinary teams (d)	5.8	6.1	6.2	5.8	6.5	6.4	6.2	(0.7)	(0.2)	(0.4)
Able to identify, formulate, and solve engineering problems - e	5.9	5.8	6.3	5.7	5.7	6.2	5.4	0.2	0.1	0.3
Understand professional and ethical responsibility - f	6.2	6.4	6.4	5.8	6.7	6.6	6.4	(0.5)	(0.2)	(0.6)
Communicate effectively - g	5.7	6.3	5.8	5.7	6.8	6.8	6.6	(1.1)	(1.0)	(0.9)
Understand Impact of engineering solutions in a global/societal context (h)	5.3	5.6	4.9	5.1	5.1	4.8	5.1	0.2	0.1	0.0
Recognize need for, and able to engage in, lifelong learning - i	5.8	6.1	5.6	6.1	6.1	6.2	6.4	(0.3)	(0.6)	(0.3)
Understand contemporary issues, including public policy (j)	4.7	5.9	4.8	4.7	4.9	5.7	5.3	(0.2)	(0.9)	(0.6)
Able to use skills necessary for constructors - k	6.0	6.1	5.4	5.5	6.2	6.4	5.6	(0.2)	(1.0)	(0.1)
Understand basic concepts in leadership and teamwork - l	6.0	5.8	5.6	5.8	6.5	6.6	6.5	(0.5)	(1.0)	(0.7)
Able to include non-engineering considerations in problem solving - m	5.7	5.4	5.8	5.3	6.2	6.4	5.8	(0.5)	(0.6)	(0.5)
Skill in negotiation or consensus-gaining in group decisions - n	5.4	5.6	5.3	5.0	6.3	6.3	6.1	(0.9)	(1.0)	(1.1)
Understand and apply project planning and management practices - o	5.9	5.8	5.7	5.7	6.5	6.6	6.2	(0.6)	(0.9)	(0.5)
Able to assess risk and make sound decisions - p	5.3	5.8	5.3	5.1	6.2	6.3	6.1	(0.9)	(1.0)	(1.0)
Know current industry practices and project delivery considerations - q	5.4	5.8	5.5	5.3	6.1	6.3	6.0	(0.7)	(0.8)	(0.7)
Other questions										
Attention to detail & discipline to check own work	5.8		6.1	5.8	6.7	6.7	6.5	(0.9)	(0.6)	(0.7)
Computer applications	6.0		5.4	5.5	6.3	6.2	5.9	(0.3)	(0.8)	(0.4)
Understanding of common construction industry terminology	5.8		5.4	5.5	6.1	6.1	6.1	(0.3)	(0.7)	(0.6)
Understanding of the construction industry	5.8		5.4	5.7	6.1	6.2	6.3	(0.3)	(0.8)	(0.6)
Understanding of construction safety issues	5.4		5.2	5.9	6.4	6.2	6.1	(1.0)	(1.0)	(0.2)
Ability to understand and interpret plans and specificatons	5.7		5.5	5.6	6.5	6.9	6.4	(0.8)	(1.4)	(0.8)
sketch and draw	5.2		5.4	4.9	5.1	5.4	5.3	0.1	0.0	(0.4)
3-D models with REVIT or similar	4.1		4.2	3.7	5.1	4.7	4.2	(1.0)	(0.5)	(0.5)
Estimating	5.4		5.4	5.3	5.9	6.5	5.9	(0.5)	(1.1)	(0.6)
planning and scheduling	5.6		5.6	4.9	6.3	6.6	6.1	(0.7)	(1.0)	(1.2)
able to develop 4-D and 5-D models	3.8		2.9	2.7	3.9	4.4	3.7	(0.1)	(1.5)	(1.0)
Project management fundamentals	5.5		5.5	5.3	6.3	6.3	6.1	(0.8)	(0.8)	(0.8)
cost accounting	5.3		5.0	4.8	5.8	6.3	5.4	(0.5)	(1.3)	(0.6)
Cost analysis	5.5		5.1	5.1	6.2	6.2	6.0	(0.7)	(1.1)	(0.9)
contracting fundamentals	5.5		5.7	4.9	6.1	6.2	6.0	(0.6)	(0.5)	(1.1)
submittal processing	5.5		4.7	4.6	6.3	6.2	5.7	(0.8)	(1.5)	(1.1)
field operations and issues	5.1		4.8	4.5	6.3	6.5	6.2	(1.2)	(1.7)	(1.7)
ownership, operation, and maintenance mgmt for constr equipment	4.7		4.8	4.8	5.0	5.1	5.1	(0.3)	(0.3)	(0.3)
Mix design and proper concrete placing	5.0		5.7	5.2	4.7	5.4	5.1	0.3	0.3	0.1
Mix design and proper asphalt placing	5.0		5.5	5.0	4.2	4.7	4.9	0.8	0.8	0.1
Understanding structural systems and fundamentals	5.4		5.8	5.4	5.2	6.0	5.2	0.2	(0.2)	0.2
mechanical systems and fundamentals	4.8		5.4	4.7	5.6	5.6	4.7	(0.8)	(0.2)	0.0
electrical systems and fundamentals	4.6		5.2	4.6	5.6	5.4	4.6	(1.0)	(0.2)	0.0
clash detection with NAVISWORKS	3.6		2.6	2.4	4.6	4.4	3.2	(1.0)	(1.8)	(0.8)

	Evaluation of Preparation by . . .				Evaluation of Importance by . . .			Preparation minus importance		
	Employers (32)	2014 Class (19-21)	2012 Class (13)	2009 Class (19)	Employers (32)	2012 Class (13)	2009 Class (19)	Employers (32)	2012 Class (13)	2009 Class (19)
building codes	4.5		4.4	4.1	5.0	5.1	4.8	(0.5)	(0.7)	(0.7)
sustainability	5.3		5.4	4.4	5.2	5.7	4.7	0.1	(0.3)	(0.3)
LEED	5.4		4.7	4.4	5.2	5.2	4.3	0.2	(0.5)	0.1
Surveying	5.5		5.7	5.3	4.8	4.2	5.1	0.7	1.5	0.2
form design	5.0		5.4	4.6	4.5	5.1	4.8	0.5	0.3	(0.2)
forming systems and forming practices	5.0		5.2	4.9	4.8	5.5	5.1	0.2	(0.3)	(0.2)
hydraulic design	4.5		5.3	4.1	3.7	4.3	3.6	0.8	1.0	0.5
architectural finishes	4.8		4.0	4.7	4.9	5.3	4.7	(0.1)	(1.3)	0.0
practical work experience	5.6		4.8	4.9	6.4	6.4	6.5	(0.8)	(1.6)	(1.6)
Understanding business management principles	5.5		5.3	5.0	5.9	5.9	5.9	(0.4)	(0.6)	(0.9)
Understanding business accounting principles	5.3		4.5	4.8	5.6	5.2	5.4	(0.3)	(0.7)	(0.6)
Understanding business finance principles	5.2		4.7	4.8	5.4	5.2	5.5	(0.2)	(0.5)	(0.7)
Understanding of marketing principles	5.0		5.0	4.3	4.9	4.8	4.7	0.1	0.2	(0.4)
Communicate through e-mail, memos, letters, mtg minutes, etc.	5.7		5.7	5.3	6.7	6.7	6.6	(1.0)	(1.0)	(1.3)
Communicate in conversations and meetings	5.6		5.9	5.0	6.9	6.6	6.7	(1.3)	(0.7)	(1.7)
Make effective presentations	5.5		6.1	5.1	6.1	5.7	6.1	(0.6)	0.4	(1.0)
Ethical standards that gain respect	6.1		6.1	5.7	6.6	6.6	6.3	(0.5)	(0.5)	(0.6)
Understanding of geographical info. systems (GIS)	4.8		5.1	4.4	3.7	3.4	3.4	1.1	1.7	1.0
laser scanning	3.6		2.7	2.8	3.8	3.5	2.8	(0.2)	(0.8)	0.0

Note: For "Preparation" and "Importance", values in red indicate score less than target minimum of 4.9. For "Preparation Minus Importance," values in red indicate a "gap" of 1 or more

Appendix B: Follow-Up on 2013 "Assessment Report and Action Plan":

Each item from the 2013 document is reproduced in italics, followed by discussion of action(s) taken in bold font.

1. *Weakness 1 – preparation for "knowledge of contemporary issues, including public policy": This is one of the ABET a)-q) outcomes adopted by the CEM Program around the turn of the century for consistency across the CCEE Department. After 2014, the CEM Program will be working toward approximately 21 outcomes defined by ACCE that will not include this outcome. CEM may still adopt it as an outcome if it chooses to do so, but the CEM Program recommends that it be dropped. Consequently, no action is required.* **No action was taken.**
2. *Weakness 2 – preparation for understanding ". . . the impact of engineering solutions in a global/societal context.": This is one of the ABET a)-q) outcomes adopted by the CEM Program around the turn of the century for consistency across the CCEE Department. After 2014, the CEM Program will be working toward approximately 21 outcomes defined by ACCE that will not include this outcome. CEM may still adopt it as an outcome if it chooses to do so, but the CEM Program recommends that it be dropped. Consequently, no action is required.* **No Action was taken.**
3. *The response of only 8 alumni from the class of 2011 (from an e-mail list of 41 from a class of over 80 graduates) is a cause for concern. The CEM Program will follow the IAC's recommendation to also solicit employers of large numbers of CEM graduates to encourage any of their employees from the target class to respond to the survey. Forming a Linked-in group for graduating CEM seniors each year is a possible method for improving response that will be attempted in 2014. If response rates are not better for future alumni surveys, other methods of outcomes assessment must be considered.* **Forming a Linked-in group did not take place in 2014, but still needs to be considered. Alumni response rates improved slightly in 2014.**
4. *Communications, written and oral, formal and informal: As usual, communications is considered extremely important by all constituencies, and preparation is not as good as all would like. CEM faculty will continue to include as many written and oral communications exercises as can be reasonably incorporated into the curriculum. CEM faculty will consider proposing teaching the writing intensive course (Construction Project Management) twice a year rather than once a year to cut the class size in half. CEM faculty will consider requiring the Obtaining Construction Contracts class and teaching it twice a year.*

In addition, the CCE School is adding a writing resource person to the staff to assist with writing in all CCE coursework. **CEM 443, the WIC course will be taught Winter 2015 and Spring 2015. It appears that a writing resource person will be available for both offerings. It does not appear that there are adequate faculty resources to require the Obtaining Construction Contracts class starting in the 2015/2016 academic year as planned. Consequently this action is deferred until the 2016/2017 academic year at the earliest.**

5. *Negotiation: Negotiation continues to be a topic where improvement of preparation is desirable. A negotiation exercise will be introduced in CEM 443, Construction Project Management.* **Thanks to Joe Fradella, the exercise was introduced and was considered successful by instructor and students.**
6. *Risk Management: Risk Management continues to be a topic where improvement of preparation is desirable. The risk assessment exercise recently introduced into CEM 442, Building Construction Management, will be retained. CEM faculty will consider introduction of a risk management class. (At the January 8, 2014 CEM Faculty meeting, it was decided that a separate class is not warranted.)* **The exercise was retained and no additional action was required. There is a graduate level risk management class available to seniors as an elective (CEM 552).**
7. *Estimating: Estimating continues to be a topic where improvement of preparation is desirable. Assessments will continue to be monitored to see if changes in the structure of the two estimating courses implemented in the 2012 – 2013 time frame are producing positive results.* **Estimating scores were 5.3 and 5.4, and only the 2012 alumni showed a gap between importance and preparation greater than 1.0.**
8. *Submittals: Ability to effectively process submittals continues to be a topic where improvement of preparation is desirable. The submittal exercise introduced into CEM 442 will be retained. In addition the submittal process is discussed in other required courses. The need for submittals and administrative procedures associated with them are topics in CE 424, Contracts and Specifications, and in CEM 443, Construction Project Management. Both are required courses. Discussion of write-in comments from the employer and alumni surveys of the 2013 cycle seem to indicate that greater depth of understanding in technical courses may help improve submittal processing preparation. The CEM faculty believes that devoting significantly more effort to the topic of submittals would lean toward training and detract from the overall goal of educating future construction managers and industry leaders. No action is planned.* **No action was taken.**

9. *Field Operations: Knowledge of field operations and issues continues to be a topic where improvement of preparation is desirable. The CEM 407 junior field-trip will be retained. Summer internships will continue to be actively promoted.* **Execution was as planned, and successful.**
10. *Relevant, practical, work experience: Summer internships will continue to be actively promoted. CEM faculty will consider devoting student chapter speaker meeting time Fall Quarter each year to having interns report on their internship experience during the summer. One option to be considered will be to require that each presenting company include a brief presentation from their intern(s). (At the January 2014 CEM Faculty/Staff meeting, Lauren agreed to add this request for presenting companies.)* **The request has been made to presenting companies.**
11. *Safety: A job hazard analysis component will be introduced in the CEM 443, Construction Project Management, term project. The CEM faculty will consider replacing the required H 385 safety course with a safety course offered by CEM faculty. (At the January 2014 CEM Faculty meeting, discussion resulted in the decision to continue having the H 385 course as the required safety course.)* **CEM 443 did include a job hazard analysis. H 385 continues as the required safety course, and the ACCE visiting team's interview with the instructor produced no negative comments.**
12. *Understanding of building codes: CEM faculty believe that CEM graduates should know enough about building codes to ask the right questions of owners, designers, and code officials. The CEM faculty does not see a practical way to introduce more coverage of building codes without detracting from overall educational objectives. However, the low scores indicate that consideration of further action is needed. Can code exercises be incorporated in existing project assignments? Can incorporation of codes be included in the estimating courses? Do students learn somewhere how to access codes? (After a lengthy discussion at the January 2014 CEM Faculty meeting, no practical method was found to improve coverage of building codes in the curriculum.)* **No action was planned or taken.**
13. *Ability to function effectively away from computers: The 2013 assessment indicates that employers see preparation to be below the target minimum. CEM faculty questions the value of the question. Technological advancements mean that future CEM graduates will seldom be away from computers, tablets, and smart phones. Discussion at the November 1, 2013 industry advisory committee resulted in the decision to drop the question from future surveys.* **The question was deleted in the 2014 assessment cycle.**
14. *Planning and Scheduling: Discussion at the June 2013 IAC meeting and the September 2013 CEM faculty meeting indicate that the low preparation score may be based on an expectation that graduates will be familiar with the details of whatever construction process that they are to schedule. On-the-job experience*

is really required to achieve this level of preparation. The survey question will be reworded to replace "planning and scheduling" with "knowledge of scheduling basics and ability to work with scheduling software such as P6." The CEM faculty will consider requiring the Obtaining Construction Contracts class as part of the CEM graduation requirements. (At the January 2014 CEM Faculty meeting, it was agreed that, starting with the 2015-2016 academic year, CEM 431 would be required for CEM graduates and that it would be offered Fall and Winter Quarters. A Category II Proposal is required.) **A Category II Proposal has not been prepared. There do not appear to be adequate faculty resources to implement this plan for the 2015-2016 academic year. Consequently this action is deferred until the 2016/2017 academic year at the earliest, requiring a Category II Proposal no later than Fall 2015.**

15. *Future ACCE Outcomes: The CEM faculty will review the CEM curriculum in light of the new standards, including new student learning outcomes, to be implemented after the 2013-2014 academic year. (At the January 2014 CEM Faculty meeting, discussion indicated that major changes are not likely to be required. The topic will be addressed more thoroughly after the October 2014 visit by the ACCE reaccreditation team and after the new ACCE-mandated student outcomes have been formally adopted. At that time the CCE strategic planning activity will also be resumed.)* **Twenty student outcomes have been mandated in the ACCE Standards approved at the July 2014 Board of Trustees meeting. In 2015, the CEM faculty need to map current course learning objectives to the ACCE student outcomes and determine if any curricular changes are required. The survey questionnaires for graduating seniors, alumni, and employers need to be modified to reflect the new ACCE student outcomes. The result of the COE strategic planning process currently underway needs to be checked for compliance with Section IX of the new ACCE standards.**

Appendix C: Other Assessment Information from 2014:

1. One topic with average scores for preparation below the target minimum for employers and alumni in the 2012, 2013, and 2014 assessment cycles (see table below) was "**understanding of building codes**." Discussion during the 2013 cycle noted that local building code officials present in CEM 442, Building Construction Management, each year. The CEM faculty believes that building codes are not a high priority for emphasis – the students need to know enough to ask the right questions of owners, designers, and code officials. The CEM faculty has no action to recommend. The IAC concurs.

	Preparation	Importance	Gap (Prep.- Imp)
2012 Employer	4.7	4.7	0.0
2013 Employer	3.9	4.9	-1.0
2014 Employer	4.5	5.0	-0.5
2012 Alumni surveyed in 2014	4.4	5.1	-0.7
2011 Alumni (08) surveyed in 2013	3.6	5.5	-1.9
2009 Alumni surveyed in 2014	4.1	4.8	-0.7
2008 Alumni (15) surveyed in 2013	3.9	5.4	-1.5
2005-2010 Alumni (57)surveyed in 2012	4.1	5.2	-1.1

2. For preparation for **planning and scheduling** for the 2014 cycle, all assessments were at or above the target minimums. This item is included because of the 2013 assessment cycle. The table has been updated to include the 2014 cycle. The 2013 average employer rating below target minimum for preparation for planning and scheduling was discussed at the June 27 IAC meeting and at the September 26 CEM faculty meeting (see table below). The CEM faculty agreed with the IAC meeting summary that noted that, ". . . the parts of planning and scheduling where improved preparation is desired is in the knowledge of sequencing of construction activities that is only fully developed through on-the-job experience with specific types of construction. The question should be phrased to assess the preparation in knowledge of scheduling basics and ability to work with scheduling software such as P6." The CEM faculty agreed that the topic is of very high importance. Requiring the "Obtaining

Construction Contracts" class experience for all graduates would probably improve preparation.

	Preparation	Importance	Gap (Prep.- Imp)
2012 Employer	5.9	6.4	-.5
2013 Employer	4.8	6.4	-1.6
2014 Employer	5.6	6.3	-0.7
2012 Alumni (13) surveyed in 2014	5.6	6.6	-1.0
2011 Alumni (08) surveyed in 2013	5.2	6.8	-1.6
2009 Alumni (19) surveyed in 2014	4.9	6.1	-1.2
2008 Alumni (15) surveyed in 2013	5.3	6.1	-0.8
2005-2010 Alumni (57)surveyed in 2012	5.1	6.2	-1.1

3. The ACCE visiting team cited a weakness in cost accounting and cost analysis during their October 2014 visit. To determine how assessments in the 2014 assessment cycle view these topics the tables below are presented. All "preparation" scores are above target minimum score of 4.9 except the alumni from the class of 2009, who did not receive as much cost accounting instruction in the estimating sequence prior to 2012. All respondents agree that the "importance" of these topics is high.

Cost Accounting

	Preparation	Importance	Gap (Prep.- Imp)
2012 Employer			
2013 Employer			
2014 Employer	5.3	5.8	-0.5
2012 Alumni (13) surveyed in 2014	5.0	6.3	-1.3
2011 Alumni (08) surveyed in 2013			
2009 Alumni (19) surveyed in	4.8	5.4	-0.6

2014			
2008 Alumni (15) surveyed in 2013			
2005-2010 Alumni (57)surveyed in 2012			

Cost Control

	Preparation	Importance	Gap (Prep.- Imp)
2012 Employer			
2013 Employer			
2014 Employer	5.5	6.2	-0.7
2012 Alumni (xx) surveyed in 2014	5.1	6.2	-1.1
2011 Alumni (08) surveyed in 2013			
2009 Alumni (xx) surveyed in 2014	5.1	6.0	-0.9
2008 Alumni (15) surveyed in 2013			
2005-2010 Alumni (57)surveyed in 2012			