

Quality Assessment Report

2013-2014
October 15, 2014

This report summarizes the continuous improvement process for the Construction Management (CM) Department during the latest assessment cycle (2013-2014). It provides a summary of the quality assessment plan, including mission, objectives, and assessment tools. The summary is followed by a discussion of data collected during the current assessment cycle, performance evaluation, and action plans for further improvement.

1. Quality Assessment Plan

Department of Construction Management Mission

Provide students with skills and knowledge that are valued by the commercial, industrial and heavy civil construction industry and result in increasing the students' marketability and potential for success.

Program Objectives

The following Program Objectives identify accomplishments in support of the CM department mission.

- Objective #1: Recruitment of Minority Groups
- Objective #2: Recruitment of female students
- Objective #3: Provide Proper Advising and Career Guidance
- Objective #4: Offer Financial Assistance
- Objective #5: Assist in Students Placement and Career Preparation
- Objective #6: Offer a Well-designed Curriculum
- Objective #7: Engagement with the Construction Industry

Student Learning Outcomes

The following represents the list of knowledge areas expected upon completion of the Construction Management (CM) degree:

- A. Communication skills, i.e. written and oral communication
- B. Engineering concepts, e.g. design concepts and analysis of structural systems
- C. Management concepts, e.g. project financing, economics, and law
- D. Materials, methods, and project Modeling and visualization

- E. Bidding and estimating, including blueprint reading and quantity take-offs
- F. Budgeting, costs, and cost control
- G. Planning, scheduling, and schedule control
- H. Construction safety
- I. Construction geomatics, e.g. site development and layout
- J. Project administration

Assessment Tools

The assessment tools used to evaluate the achievement of Program Objectives and Student Learning Outcomes are listed below:

- 1) AIC Certification Exam
- 2) Graduating Seniors' Surveys
- 3) Alumni Surveys
- 4) Employers' Surveys
- 5) Industry Advisory Board (IAB) course review
- 6) University's End of Semester Course Evaluation
- 7) Instructor's Assessment (mapping of course objectives, assessment, and outcomes)
- 8) Midterm Students' Surveys (Start-Stop-Continue Feedback)

Table 1 below lists the assessment tools used to evaluate the achievement of Student Learning Outcomes and Educational Program Objectives.

Table 1: Assessment Tools

	Internal Assessment Tools					External Assessment Tools			
	Enrollment/Scholarship	Course Evaluation	Instructor Assessment	Midterm Survey	Senior Survey	AIC Exam	Alumni Survey	Employer Survey	IAB Review
Program Objectives									
1: Recruitment of Minority Groups	X								
2: Recruitment of female students	X								
3: Provide Proper Advising and Career Guidance					X				
4: Offer Financial Assistance	X								
5: Assist in Students Placement and Career Preparation					X				
6: Offer a Well-designed Curriculum					X		X	X	
7: Engagement with the Construction Industry							X	X	X
Student Learning Outcomes									
A: Communication skills						X			
B: Engineering concepts						X			
C: Management concepts						X			
D: Materials, methods, project modeling & visualization						X			
E: Bidding & estimating, incl. blueprint & take-offs						X			
F: Budgeting, costs, and cost control						X			
G: Planning, scheduling, and schedule control						X			
H: Construction safety						X			
I: Construction geomatics						X			
J: Project administration						X			
Course Level Improvement		X	X	X					

2. Assessment and Action Plans (2013-2014)

In the 2013-2014 assessment cycle, the CM Department has focused on evaluating Program Objectives and Student Learning Outcomes based on AIC exam, Graduating Senior Survey, Employer Survey, Alumni Survey, and IAB review. The data collected during this assessment cycle is described first. It is followed by an assessment of Program Objectives and Learning Outcomes.

2.1 Data Collection

AIC Exam Reports

Table 1 below summarizes the results of the AIC exam in the last eight semesters. The Table benchmarks our students' mean score to the national mean score, highlights the knowledge areas where our students' performance surpassed the national average, and reports the national passing rate against ours.

Graduating Senior Survey

The Graduating Senior Survey was administered to senior level Construction Management (CM) students during the spring 2014 semester who applied to graduate during spring and summer of 2013. The survey was distributed face-to-face during a Construction Management lecture. Of the 58 students who were invited to participate, 37 students responded, results in a 64% overall response rate. The current analysis contains a brief, detailed summary of findings.

In addition to demographic and employment information, the survey asks students to provide self-ratings of their skill levels on several knowledge areas. Results are compiled and distributed by the College Assessment and Continuous Improvement committee.

Summary of Survey Findings

- 61% of CM recent graduates rated the overall effectiveness of the faculty teaching CM courses as *usually effective*, while 21% rated the faculty teaching as *very effective*.
- 50% of our graduates found the education received in the CM program as *valuable* and 34% of students reported that the program was *highly valuable*.
- Students rated the following courses having the most value in the program: CNST 3351/3365: Estimating II, CNST 3331: Planning and Scheduling, CNST 2351: Estimating I, CNST 3205/3210: Construction Safety, CNST 2341/2345: Construction Documents, and CNST 1301/1325: Materials and Methods.
- Students reported very good to excellent skill levels in management concepts, bidding and estimating, budgeting, cost and cost control, and project administration.

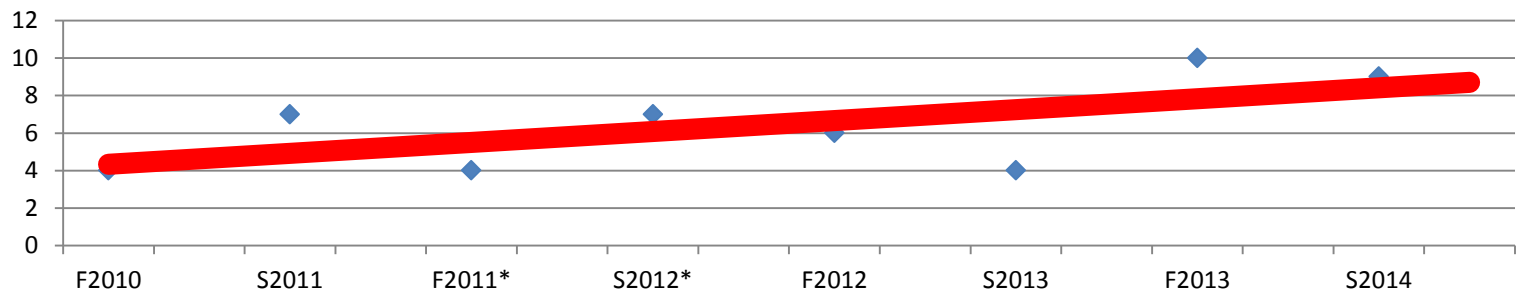
Future Plans

- 57% plan to attend graduate or professional school
- 73% plan to or have accepted full-time employment
- 35% of students intend to take the CPC exam (level II AIC exam) in the near future

Table 1: Level 1 – Associate Constructor Exam Performance Comparison

AIC CATEGORIES	F2010		S2011		F2011		S2012		F2012		S2013		F2013		S2014		# Times Above NAT. AVG
	UH-CM	NAT. AVG	UH-CM	NAT. AVG	UH-CM	NAT. AVG	UH-CM	NAT. AVG	UH-CM	NAT. AVG	UH-CM	NAT. AVG	UH-CM	NAT. AVG	UH-CM	NAT. AVG	
Communication Skills	8.87	10.68	10.48	10.69	8.86	9.57	20.77	20.62	20.27	20.95	20.55	21.52	22.12	20.92	19.97	20.22	2
Engineering Concepts	18.58	18.91	19.74	18.76	17.69	18.81	19.63	20.25	9.58	9.19	8.94	9.16	9.06	8.95	9.67	9.08	3
Management Concepts	9.65	9.54	10.26	9.48	9.33	9.26	31.04	25.83	26.6	25.39	25.75	25.39	26.05	24.9	27.14	25	8
Materials, Methods, and Plan Reading	20.68	22.88	21.74	22.75	17.84	20.24	19.4	21.42	20.82	20.99	19.17	20.53	20.75	20.16	21.71	20.49	2
Bidding and Estimating	36.35	35.49	35.39	35.62	32.29	35.15	28.27	29.86	28.98	29.39	29.07	29.21	29.31	28.34	30.24	28.62	3
Budgeting, Costs, and Cost Control	21.94	21.74	22	21.59	21.27	22.62	23.62	19.31	25.2	24.39	24.15	24.02	25.04	23.37	25.03	23.11	7
Planning, Scheduling, and Control	35.29	35.34	37.94	35.5	37.61	35.94	37.27	34.25	36.62	33.4	34.82	33.45	36.48	32.68	36.69	32.37	7
Construction Safety	15.1	15.81	16.06	15.99	15.06	15.45	13.33	13.05	15.51	15.56	15.43	15.35	16.18	15.18	16.09	15.12	5
Surveying and Project Layout / Construction Geomatics	4.35	4.52	4.06	4.53	3.63	4.28	4.46	5.02	4.09	4.84	4.05	4.64	4.12	4.47	4.41	4.59	0
Project Administration	40.61	39.49	41.65	39.56	39.43	39.3	22.23	20.95	25.89	25.53	25.14	25.65	25.86	25.2	27.5	26.27	7
AVG Total Score	211.42	214.4	219.32	214.47	204.94	210.27	212.67	210.59	213.56	209.64	207.06	208.93	214.97	204.16	218.45	204.86	5
Number of Skills Above National Average	4		7		4		7		6		4		10		9		

Number of Skills Above National Average



Students also provided qualitative comments regarding the company that they interned with. One student commented, “I worked full time during the program,” while others commented that they interned with companies such as, Vaughn construction, Cactus Builders, and James Hardy Building Process. When asked if students were adequately prepared for the AIC exam and also if they would recommend the CM degree at UH to others, students responded with overall positive comments. Some reported, “absolutely,” while others commented that they would “definitely recommend the degree to those interested in construction.”

Alumni Survey

In the summer of 2014, the college conducted an Alumni Survey focusing on recent graduates. 78 responses were received. The participants were asked to judge the importance of the skills and knowledge learned in the CM curriculum to their current jobs. They were also asked to rate their level of preparedness in these areas at the time of graduation from UH. The participants judged their level of preparedness in most areas of skills and knowledge as good. These areas included management concepts (e.g., project financing, economics, and law); materials, methods, equipment, and project modeling and visualization; bidding and estimating, including blueprint reading and quantity take-offs; budgeting, costs, and cost control; planning, scheduling, and schedule control, construction geomatics (e.g., site development and layout; and project administration. The one area identified as adequate by the respondents was engineering concepts (e.g., design and analysis of structural and MEP systems).

The survey also asked the participants for any additional comments about the Construction Management program. Overall the qualitative comments were positive, with one student reflecting, “I believe that the construction management program prepared me for working at an engineering construction firm by providing me the basic knowledge of the different parts of a construction project.”

Employer Survey

In fall 2014, the Construction Management Employer Survey was administered to employers who currently employ recent CM graduates from UH with 19 responses.

On average, employers reported that they have employed 10 Construction Management UH graduates within the last five years. The current analysis below contains brief and more specific summary of findings.

Summary of Survey Findings

- From the employers perspective, 50% of the CM graduates have held positions in executive management positions, 58.82% is senior management positions, and 70.59% in middle management positions.
- Employers reported *excellent performance* of UH CM graduates within their company in the following areas: project administration and management, written communication skills, verbal communication skills, leadership skills, project controls (estimating, planning and scheduling, cost control), attention to safety issues, and ethics and professionalism

- The employers *strongly agreed* that their company is satisfied with the overall quality of UH CM graduates, while 53.33% *agreed* that UH CM graduates are able to make a positive contribution to the work place with minimal supervision.

Employers also provided some qualitative comments regarding feedback on any area of the CM program at UH. One employer reported, “Performance varies depending on individual, but, overall, recent hires (in the past couple of years) seem to be better prepared than hired in the past.” Another commented, “AIC certification is a definite plus.”

Industry Advisory Board (IAB) Course Review

The Industry Advisory Board (IAB) reviewed and commented on the course content based on ten construction course binders in the August 2014 meeting. Ten industry representatives attended the course review session and provided comments for course content improvement.

2.2 Program Objectives Assessment

Objective #1: Recruitment of Minority Groups

Measurement: Enrollment vs. ethnicity data

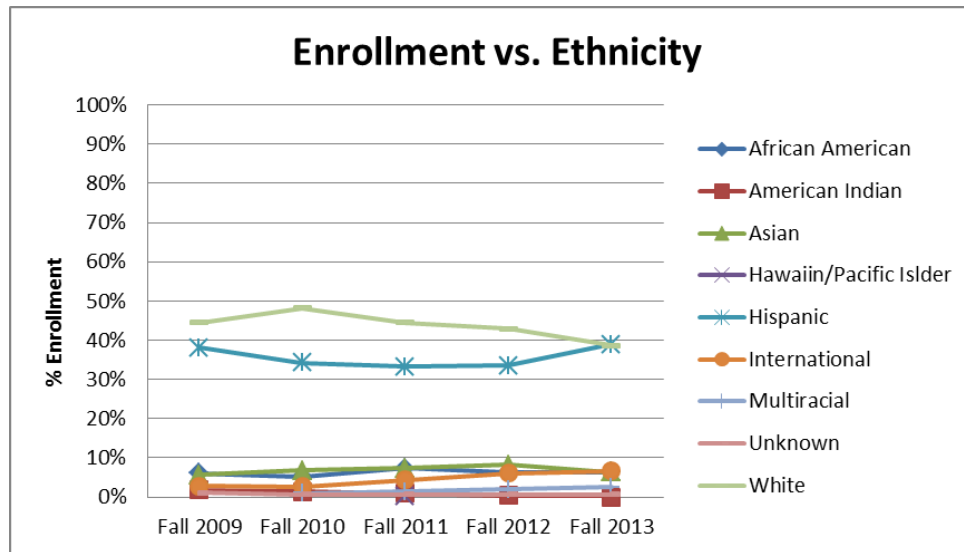
Criterion: Consistent healthy mix of diverse ethnic groups in students.

Evaluation:

The Department Chair (Dr. Eldin) is actively involved in minority students’ recruitment through personal visits to high schools and community colleges with large minority populations of both Hispanic Americans and African Americans. Also, the department emphasizes mentoring of our minority students by our diverse faculty members.

The Department Chair has served on the Board of Directors and served as Vice-Chair for the ACE National Mentoring Program to promote CM as a profession. ACE is a national organization that focuses on attracting and recruiting minority students to the professions of Architecture, Construction, and Engineering.

The chart below shows the CM enrolment by ethnic groups. The healthy mix of diverse ethnic groups in students, staff, and faculty confirms our success in reaching this objective.



CM Enrollment by Ethnicity 2010 –2013

Actions: Based upon this satisfactory performance, we will continue to actively engage in activities that support this objective.

Objective #2: Recruitment of female students

Measurement 1: Enrollment vs. gender data

Measurement 2: Female students in leading roles in student organizations and activities

Criterion 1: Consistent enrollment rate of female students.

Criterion 2: Female students in leadership positions in one or more students’ chapters.

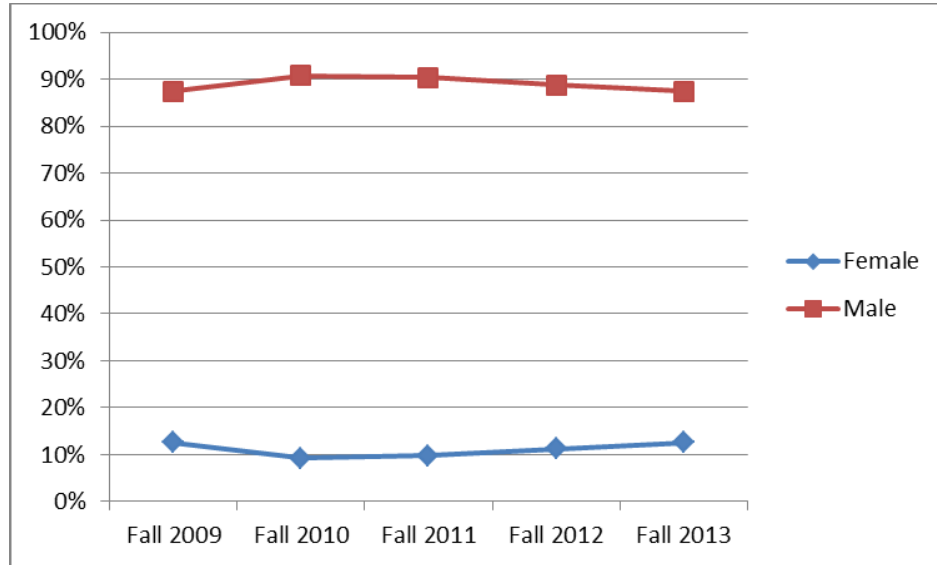
Evaluation:

Female students are especially encouraged to take leading roles in CM extracurricular activities and student organizations. As a result, many female students joined the Student Chapters as members and officers Student Chapters including the position of Presidents, Vice-Presidents, and Committee Chairs of ABC, AGC, WCA, and Sigma Lambda Chi (SLC- International Honorary Society).

The Women Contractor Association (WCA) UH chapter was established three years ago. WCA is a non-profit organization composed of women decision-making executives within the construction industry. In spring 2013, the Women in Construction Scholarship endowment was spearheaded by Sandra Clunn, president of Enviro-San and Clunn Acoustical Systems.

Female students are encouraged to participate in high visibility extracurricular activities. The student teams presenting UH at National Construction Management Competitions (ABC, AGC, etc.) have always included female students.

The consistent enrollment rate of female students, the engagement of our female students in leadership positions in all students’ chapters, the establishment of the WCA chapter, and the founding of the WCA scholarship endowment show our success in reaching this objective. The chart below shows enrollment by gender.



Enrollment by Gender 2010 –2013

Actions: Based upon this satisfactory performance, we will continue to actively engage in activities that support this objective.

Objective #3: Provide Proper Advising and Career Guidance

Measurement: Graduating Senior Survey. Students are asked to rate their experience in regard to academic advising services offered by CM department on a scale of 1 to 5 (1= Poor; 5 = Very Satisfied).

Criterion: A satisfaction rating equal to or above 3 (i.e. good) in all ratings.

Evaluation:

A Graduating Senior Survey was administered to CM students in the spring 2013 semester. Thirty-seven students responded to the survey. The mean ratings are shown below:

Helpful advice in developing my program of study	3.4
Helpful advice in selecting courses for each term	3.6
Overall advice from the CM department	3.6

Once admitted to the College, students receive advising and counseling from the CM Department, as well as from full-time staff at the College’s Academic Service Center

(ASC). Throughout their program, students periodically receive formal advising and counseling from the Department Chair and full-time CM faculty and the ASC office.

The favorable survey results and the high morale of our students, high retention rate, and unsolicited positive feedback confirm our success in reaching this objective.

Actions: Based upon this satisfactory performance, we will continue to actively engage in activities that support this objective.

Objective #4: Offer Financial Assistance

Measurement: Scholarship endowments

Criterion: Securing one scholarship endowment per year.

Evaluation:

Students are offered many opportunities to help students with the financial burden of college education. The Department is active in placing students in well-paying jobs/internships as they attend school. In addition, a number of students receive scholarships and/or compensation to participate in undergraduate-research activities under the supervision of CM faculty.

Our success in reaching this objective is supported by the number of scholarship endowments (6 each ranging \$25,000-\$50,000) we secured in the last 5 years, in addition to the fact that all CM students are placed and receive good compensation (\$15-25/hr) during the time they attend school.

Actions: Based upon this satisfactory performance, we will continue to actively engage in activities that support this objective.

Objective #5: Assist in Students Placement and Career Preparation

Measurement: Graduating Senior Survey. Students are asked to rate their experience in regards to career services offered by CM department and the college on a scale of 1 to 5 (1= Poor; 5 = Very Satisfied).

Criterion: A satisfaction rating equal to or above 3 (i.e. good) in all ratings.

Evaluation:

The mean ratings from the spring 2014 CM Graduating Senior Survey are shown below, which are satisfactory.

Advice from CM faculty concerning the profession	3.9
Career fairs offered by the Academic Services Center	3.3

The Department continues to send information to the students regarding opportunities for internships, part-time, and full-time positions. The Department Chair and the ASC office assist students in resume writing and interview skills. Every year, the CM student chapters arrange for 4-6 professional presentations by prominent guests from the industry to address issues/questions regarding the students' field of interest. In addition, the college schedules two career fairs each year for our students.

Actions: Based upon this satisfactory performance, we will continue to actively engage in activities that support this objective.

Objective #6: Offer a Well-designed Curriculum

Measurement: Graduating Senior Survey, Alumni Survey, and Employer Survey. Respondents are asked to evaluate skill level/performance in key CM knowledge areas on a scale of 1 to 5 (1 = Poor; 5 = Excellent).

Criterion: A satisfaction rating equal to or above 3 (i.e. good) in all ratings.

Evaluation:

The CM Department utilized the ACCE guidelines in developing a well-balanced curriculum. In addition, we engaged our industry advisory board member companies in enhancing and periodically reviewing our curriculum. Our success in reaching this objective is confirmed by: 1) receiving our ACCE accreditation and 2) in the last two years, two of our students earned the highest score in the AIC National Certification Exam (AC-level).

The Graduating Senior Survey was conducted in spring 2014 with 37 responses from CM senior students. Alumni Survey was conducted in summer 2014 with 78 responses. Employer Survey was administered in fall 2014 with 19 responses. As shown below, the ratings in all curriculum areas in the Graduating Senior Survey and Employer surveys are satisfactory. However, there are three areas were flagged in the Alumni Survey: engineering concepts (2.5); materials & methods, project modeling, visualization (2.9); and construction geomatics (2.6).

Graduating Senior Survey: Rate your skill level in the following areas:

Communication skills	3.9
Engineering concepts	3.5
Management concepts	4.3
Materials, methods, project modeling, visualization	3.8
Bidding and estimating	4.1
Budgeting, cost, cost control	4.1
Planning, scheduling, schedule control	3.9
Construction safety	4.3
Construction geomatics	3.4

Project administration	4.1
------------------------	-----

Alumni Survey: Rate your level of preparedness regarding the following skills and knowledge upon graduation from the UH CM program:

Communication skills	3.3
Engineering concepts	2.5
Management concepts	3.0
Materials, methods, project modeling, visualization	2.9
Bidding and estimating	3.1
Budgeting, cost, cost control	3.0
Planning, scheduling, schedule control	3.1
Construction safety	3.1
Construction geomatics	2.6
Project administration	3.1

Employer Survey: Indicate the level of performance of UH CM graduates within the company:

Project administration and management	4.0
Written communication skills	3.7
Verbal communicate skills	3.9
Leadership skill	3.9
Project controls (estimating, scheduling, cost control)	3.9
Attention to safety issues	3.9
Ethics and professionalism	4.1

Actions:

To ensure timely feedback, the Alumni Survey will be administered more frequently. Analysis of the Alumni Survey indicated that the respondents graduated from the CM program 8 years ago (on average). Major changes have been made in recent years to the CM program and the curriculum, including restructuring CM curriculum since 2007 and changing program accreditation from ABET to ACCE in 2009. Therefore, we will keep monitoring the ratings in future surveys.

Objective #7: Engagement with the Construction Industry

Measurement: Solicit feedbacks through Alumni Survey, Employer Survey, and IAB curriculum review.

Criterion: Satisfaction of employers measured through Alumni Survey, Employer Survey, and IAB members.

Evaluation:

The most recent Alumni Survey and Employer Surveys were conducted in summer and fall 2014, respectively. The Industry Advisory Board (IAB) meets quarterly. For curriculum development, IAB reviewed and commented 5 courses presented by the

instructor during the board meetings conducted in the last 2 years, and an additional 10 construction course binders in the August 2013 meeting. Furthermore, the CM program engages the construction industry through many other venues. This includes hiring industry professionals to teach CM courses, inviting industry professionals to mentor students' chapters, and involving the industry advisory board members in periodical reviews of the curriculum and student extracurricular activities. In addition, our students are engaged in extended internship experience (1-3 years).

Actions: Based upon this satisfactory performance, we will continue to actively engage in activities that support this objective.

Student Learning Outcomes Assessment

Measurement: AIC Certification Exam.

Criterion: Program's test score to meet or exceed the national average score in each learning outcomes/test category.

Evaluation:

See Table 1 presented previously for the AIC exam summary results in recent years. Table 1 benchmarks our students' score to the national average score, highlights the knowledge areas where our students' performance surpassed the national average, and reports the national passing rate against ours.

Upon receiving the assessment results, the CM faculty and the Assistant Dean for Assessment and Accreditation review the data at both individual students and aggregate levels. Discussion of results centers on potential issues that may need to be addressed and delineation of any actions that need to be taken.

Results of the AIC Examination suggested some enhancement. Based upon spring 2014 data, out of the 10 knowledge areas reported by AIC, the following were identified as candidates for improvement:

- Communication Skills
- Construction Geomatics

Discussions and analyses have focused on developing improvement initiatives as discussed in the following section.

Actions:

Based on the available data and faculty recommendations, the CM program has enacted the following improvement initiatives in the last 5 years:

1. Created a healthy culture for taking the certification exam by incorporating sections of the AIC Study Manual in several courses.

2. Offered online study training for the AIC exam by using one of the commercially available training programs (RedVector).
3. Encouraged the formation of study groups and help/review sessions to answer students' questions.
4. Addressed the identified weakness area (communication skills) by the following enhancements:
 - a. Additional lectures to aid students in presentations skills in CNST 4331.
 - b. Additional requirement of a technical paper on a topic related to either safety or ethics and a mandatory review session with the University Writing Center in CNST 1361.
 - c. Introduction of proper phone, email, and texting etiquette in CNST 1361, 3331, and 4331.
 - d. Videotaped students' presentations in CNST 4331 to aid them to more effective communication skills.

The improvement trend displayed above (fall of 2010 to the spring of 2014) indicates that our initiatives have been effective. The CM faculty will continue to review the areas of weakness from the test results to determine necessary actions to be implemented in the future.