

Manufacturing & Construction Management Department

UNDERGRADUATE PROGRAM: BS in Construction Management

Assessment Report

Academic Year 2016-17

Overview

Department: Manufacturing & Construction Management

Report Preparer: Prof. Talat Salama, PhD, PE

Program Name and Level: B.S. Construction Management

Program Assessment Question	Response
1) URL: Provide the URL where the learning outcomes (LO) can be viewed.	http://www.ccsu.edu/mcm/constructionManagementBS.html
2) LO Changes: Identify any changes to the LO and briefly describe why they were changed (e.g., LO more discrete, LO aligned with findings)	No changes to the LO since last report. The required number of credit hours for the program was modified from 130 to 120.
3) Strengths: What about your assessment process is working well?	The Associated Constructor (AC) exam results, of the American Institute of Constructors (AIC), provide national benchmarking information. Interviews by the Industry Advisory Board (IAB) provide a flexible data source.
4) Improvements: What about your assessment process needs to improve? (a brief summary of changes to assessment plan should be reported here)	An alumni survey would be useful.
For Each Learning Outcome (LO) complete questions 5, 6 and 7 (you may add more rows if you have more than 5 LOs):	
LO #1) Students will have basic knowledge of, and be able to apply, the concepts of estimating, scheduling, superintendency and project management.	
5) Assessment Instruments: For each LO, what is the source of the data/evidence, other than GPA, that is used to assess the stated outcomes? (e.g., capstone course, portfolio review and scoring rubric, licensure examination, , etc.)	<ol style="list-style-type: none"> 1. AIC Associate Constructor Exam – All students will take the exam in the semester they are scheduled to graduate. This exam is offered every year in November and April. 2. IAB Exit Interview – The Industrial Advisory Board (IAB) will conduct exit interviews with graduating students during the Fall and Spring semester of each year. These interviews will typically occur during the reading days at the end of the semester. Student learning is self-reported. 3. Student Course Evaluations – Each instructor will conduct course evaluations at the end of each semester. Students will complete the evaluations and turn them in to the Department Secretary, Department Chair or DEC Chair directly. Faculty members will not review the course evaluations prior to submission of final grades. The results will be used to evaluate faculty classroom performance.
6) Interpretation: Who interprets the evidence? (e.g., faculty, Admn. assistant, etc.). If this differs by LO, provide information by LO.	All evidence, except the IAB interviews, is interpreted first by the Program Coordinator and then by the program faculty as a whole. The information obtained is then discussed with the IAB. The IAB interviews are interpreted first by the President of the IAB and then are discussed with the IAB and the program faculty.
7) Results: Since the most recent full report, state the conclusion(s)	Conclusion: With regard to the AIC exam, we met our primary goal of 85% of students scoring higher than 50% in 6 of the 6 sub-content areas. We met our secondary goal of 70% of students scoring 70% or higher in one

<p>drawn, what evidence or supporting data led to the conclusion(s), and what changes have been made as a result of the conclusion(s).</p>	<p>sub-content areas (Planning, Scheduling & Control), and three other areas are showing continuous improvement. Our other assessment tools show this outcome as being met.</p>
	<p>Evidence (e.g., conclusion based on data in table x): Data contained in Appendices A and B.</p>
	<p>Changes: Faculty are meeting regularly to continue to monitor and discuss progress.</p>
<p>LO #2) Students will be able to apply computers and computer software to various construction management processes.</p>	
<p>5) Assessment Instruments: For each LO, what is the source of the data/evidence, other than GPA, that is used to assess the stated outcomes? (e.g., capstone course, portfolio review, licensure examination, etc.)</p>	<ol style="list-style-type: none"> 1. AIC Associate Constructor Exam – All students will take the exam in the semester they are scheduled to graduate. This exam is offered every year in November and April. 2. IAB Exit Interview – The Industrial Advisory Board will conduct exit interviews with graduating students during the Fall and Spring semester of each year. These interviews will typically occur during the reading days at the end of the semester. Student learning is self-reported. 3. Student Course Evaluations – Each instructor will conduct course evaluations at the end of each semester. Students will complete the evaluations and turn them in to the Department Secretary, Department Chair or DEC Chair directly. Faculty members will not review the course evaluations prior to submission of final grades. The results will be used to evaluate faculty classroom performance. 3. CM485 Senior Seminar – This course is offered every semester for graduating seniors. The course content includes a series of computer skills assessments.
<p>6) Interpretation: Who interprets the evidence? (e.g., faculty, Admn. assistant, etc.). If this differs by LO, provide information by LO.</p>	<p>All evidence, except the IAB interviews, is interpreted first by the Program Coordinator and then by the program faculty as a whole. The information obtained is then discussed with the IAB. The IAB interviews are interpreted first by the President of the IAB and then are discussed with the IAB and the program faculty.</p>
<p>7) Results: Since the most recent full report, state the conclusion(s) drawn, what evidence or supporting data led to the conclusion(s), and what changes have been made as a result of the conclusion(s).</p>	<p>Conclusion: With regard to the AIC exam, we met our primary goal of 85% of students scoring higher than 50% in this area, where a 100% of the students met this goal. Based on the outcome of this year’s assessment it would appear that the addition of computer skills assessment in the CM 485 course is having the desired results. The data for this outcome was first provided by the AIC starting academic year 2015-16.</p>
	<p>Evidence (e.g., conclusion based on data in table x): Data Contained in Appendix A and B.</p>
	<p>Changes: Faculty are meeting regularly to continue to monitor and discuss progress.</p>
<p>LO #3) Students will be able to analyze construction materials, methods and equipment, and have basic knowledge of their application to the construction process.</p>	
<p>5) Assessment Instruments: For each LO, what is the source of the data/evidence, other than GPA, that is used to assess the stated</p>	<ol style="list-style-type: none"> 1. AIC Associate Constructor Exam – All students will take the exam in the semester they are scheduled to graduate. This exam is offered every year in November and April.

<p>outcomes? (e.g., capstone course, portfolio review, licensure examination, etc.)</p>	<p>2. IAB Exit Interview – The Industrial Advisory Board will conduct exit interviews with graduating students during the Fall and Spring semester of each year. These interviews will typically occur during the reading days at the end of the semester. Student learning is self-reported.</p> <p>3. Student Course Evaluations – Each instructor will conduct course evaluations at the end of each semester. Students will complete the evaluations and turn them in to the Department Secretary, Department Chair or DEC Chair directly. Faculty members will not review the course evaluations prior to submission of final grades. The results will be used to evaluate faculty classroom performance.</p>
<p>6) Interpretation: Who interprets the evidence? (e.g., faculty, Admn. assistant, etc.). If this differs by LO, provide information by LO.</p>	<p>All evidence, except the IAB interviews, is interpreted first by the Program Coordinator and then by the program faculty as a whole. The information obtained is then discussed with the IAB. The IAB interviews are interpreted first by the President of the IAB and then are discussed with the IAB and the program faculty.</p>
<p>7) Results: Since the most recent full report, state the conclusion(s) drawn, what evidence or supporting data led to the conclusion(s), and what changes have been made as a result of the conclusion(s).</p>	<p>Conclusion: With regard to the AIC exam, we met our primary goal of 85% of students scoring higher than 50% in 2 of the 3 sub-content areas (Materials, Methods & Plan Reading and Construction Geomatics). The Engineering Concepts sub-content area stayed the same as compared to last year. The AIC exam results show that our scores are comparable to the national average in all areas. We believe that fundamental math skills need improvement. The exit interview continues to indicate success in this area.</p>
	<p>Evidence (e.g., conclusion based on data in table x): Data contained in Appendices A and B.</p>
	<p>Changes: The faculty teaching the courses CM 425 Applied Structural Systems and ET 241 Applied Statics and Strength of Materials met and discussed possible ways to improve this outcome. Among the changes implemented starting last Spring, Spring 2016, was changing the required book for the two courses to an up-to-date book, and having ET 241 (the pre-req course to CM 425) cover the first half of the book, and CM 425 to cover the second half. It is expected that this change will have a positive impact on the AIC 2017-18 test scores.</p> <p>The Program is also conducting a research study of students’ math skills at all levels. The goal of the study is to determine the appropriate point in the curriculum to focus of additional math instruction. This study is currently in its fifth year. We should have sufficient data to complete the analysis at the end of the 2017-2018 academic year.</p>
<p>LO #4) Students will be able to communicate clearly and effectively.</p>	
<p>5) Assessment Instruments: For each LO, what is the source of the data/evidence, other than GPA, that is used to assess the stated outcomes? (e.g., capstone course, portfolio review, licensure examination, etc.)</p>	<p>1. AIC Associate Constructor Exam – All students will take the exam in the semester they are scheduled to graduate. This exam is offered every year in November and April.</p> <p>2. IAB Exit Interview – The Industrial Advisory Board will conduct exit interviews with graduating students during the Spring semester of each year. These interviews will typically occur during the reading days at the end of the semester. Student learning is self-reported.</p> <p>3. Student Course Evaluations – Each instructor will conduct course evaluations at the end of each semester. Students will complete the evaluations and turn them in to the Department Secretary, Department Chair or DEC</p>

	Chair directly. Faculty members will not review the course evaluations prior to submission of final grades. The results will be used to evaluate faculty classroom performance.
6) Interpretation: Who interprets the evidence? (e.g., faculty, Admn. assistant, etc.). If this differs by LO, provide information by LO.	All evidence, except the IAB interviews, is interpreted first by the Program Coordinator and then by the program faculty as a whole. The information obtained is then discussed with the IAB. The IAB interviews are interpreted first by the President of the IAB and then are discussed with the IAB and the program faculty.
7) Results: Since the most recent full report, state the conclusion(s) drawn, what evidence or supporting data led to the conclusion(s), and what changes have been made as a result of the conclusion(s).	Conclusion: Data indicates a continued improvement in this area. The AIC exam shows we met our primary goal of 85% of students scoring higher than 50% in that content areas, and we met the secondary goal of 70% of students scoring higher 70% or higher. Based on this outcome it would appear that the addition of ENGR290 to the curriculum in Fall 2013 is having the desired results.
	Evidence (e.g., conclusion based on data in table x): Data contained in Appendices A and B.
	Changes: Based on this assessment there are no changes required and none are planned for the near future.

Table 1. The graduations with B.S. in Construction Management by semester and year for the past five years:

	2012-13	2013-14	2014-15	2015-16	2016-17
Spring Graduates	16	20	38	15	23
Fall Graduates	32	24	24	16	22
Total Graduates	48	44	62	31	45

Table 2. Total student enrollment in the CM B.S. program for the past five years:

	2012-13	2013-14	2014-15	2015-16	2016-17
Enrollment	210	210	215	223	230

Appendix A – AIC Exam Results & Analysis

Table A-1. AIC exam data of 2016-2017; Number of Students in a Range of Results

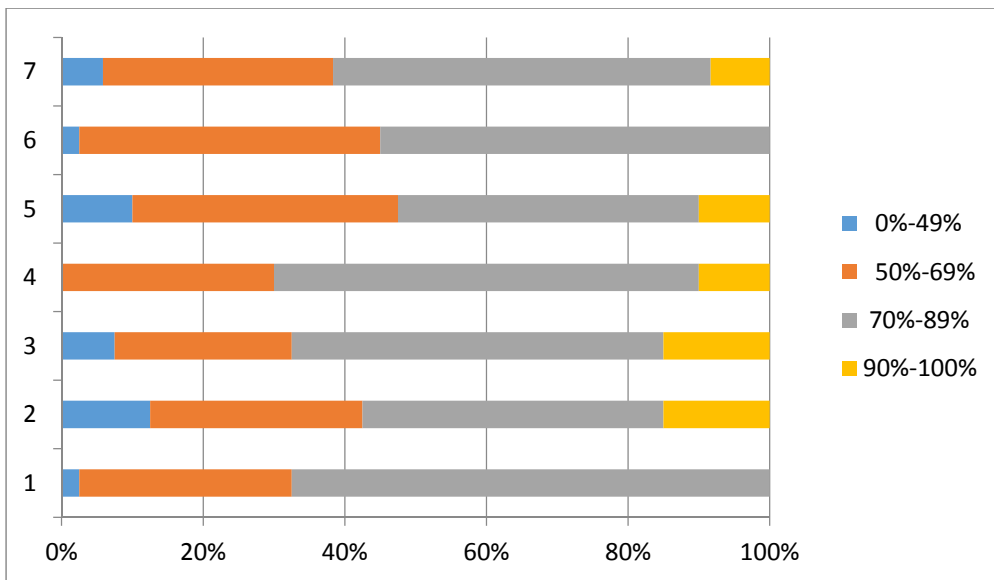
		number of CCSU students in a range of results				average score of CCSU students	national average AIC score	
	AIC exam category related to Outcome #1 from CM program at CCSU	number of CCSU students	0%-49%	50%-69%	70%-89%			90%-100%
1	Management Concepts	40	1	12	27	0	69%	74%
2	Bidding & Estimating	40	5	12	17	6	69%	70%
3	Budget, Cost & Cost Control	40	3	10	21	6	69%	76%
4	Planning Scheduling & Control	40	0	12	24	4	69%	76%
5	Construction Safety	40	4	15	17	4	71%	70%
6	Project Administration	40	1	17	22	0	71%	72%
7	TOTAL		14	78	128	20	70%	73%

		number of CCSU students in a range of results				average score of CCSU students	national average AIC score	
	AIC exam category related to Outcome #2 from CM program at CCSU	number of CCSU students	0%-49%	50%-69%	70%-89%			90%-100%
1	Computer Applications	40	0	22	16	2	71%	72%

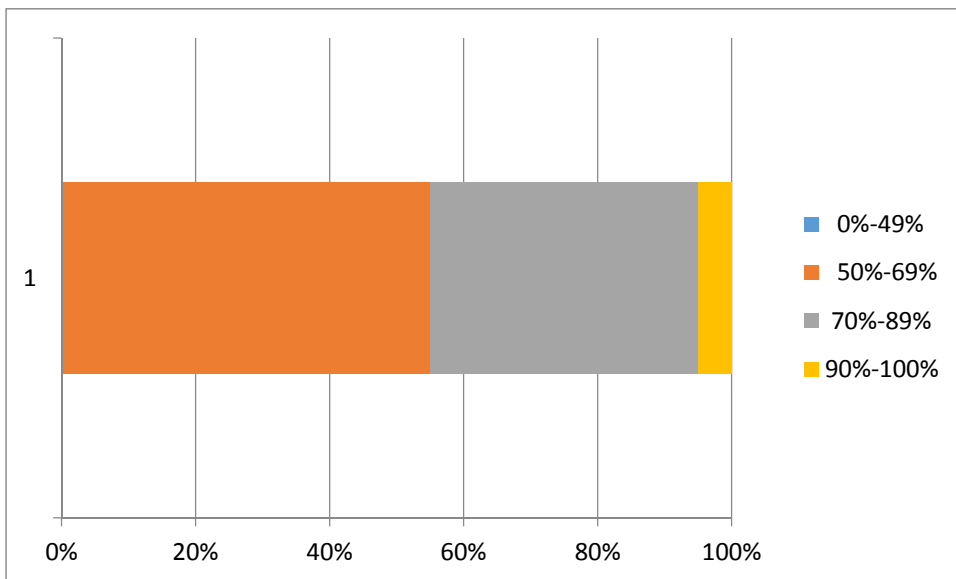
		number of CCSU students in a range of results				average score of CCSU students	national average AIC score	
	AIC exam category related to Outcome #3 from CM program at CCSU	number of CCSU students	0%-49%	50%-69%	70%-89%			90%-100%
1	Engineering Concepts	40	11	20	8	1	73%	60%
2	Materials, Methods & Plan Reading	40	3	18	14	5	70%	70%
3	Construction Geomatics	40	3	13	21	3	73%	60%
4	TOTAL		17	51	43	9	72%	63%

	AIC exam category related to Outcome #4 from CM program at CCSU	number of CCSU students	number of CCSU students in a range of results				average score of CCSU students	national average AIC score
			0%-49%	50%-69%	70%-89%	90%-100%		
1	Communication Skills	40	0	12	26	2	39%	27%

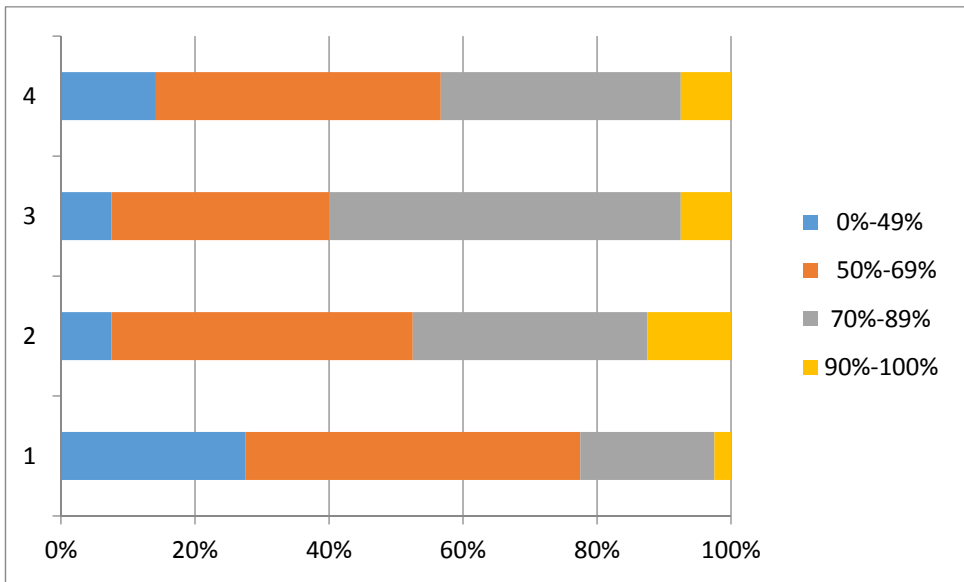
Figure A-1. Graphs Showing Number of Students in a Range of Results in the Learning Outcomes of the AC Exam



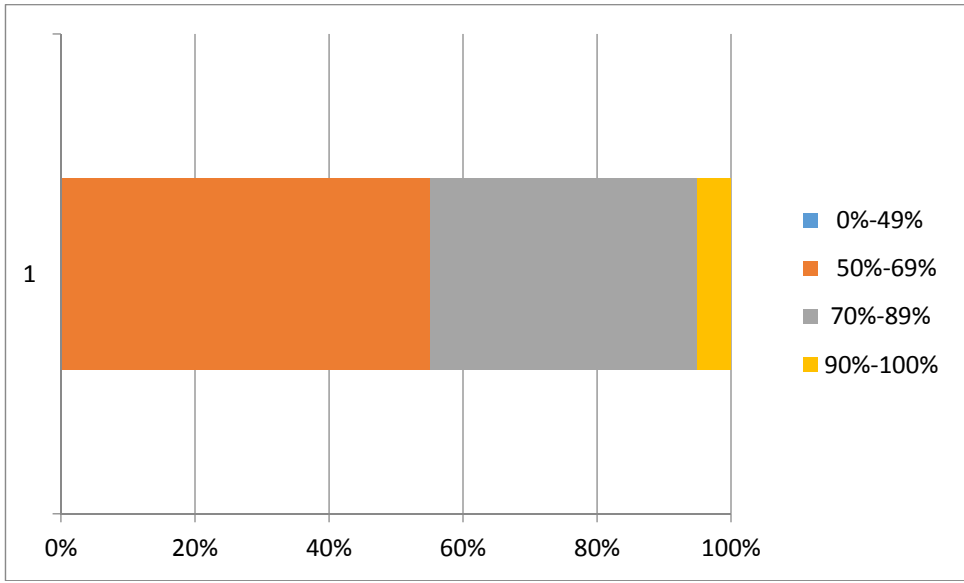
Outcome #1



Outcome #2



Outcome #3

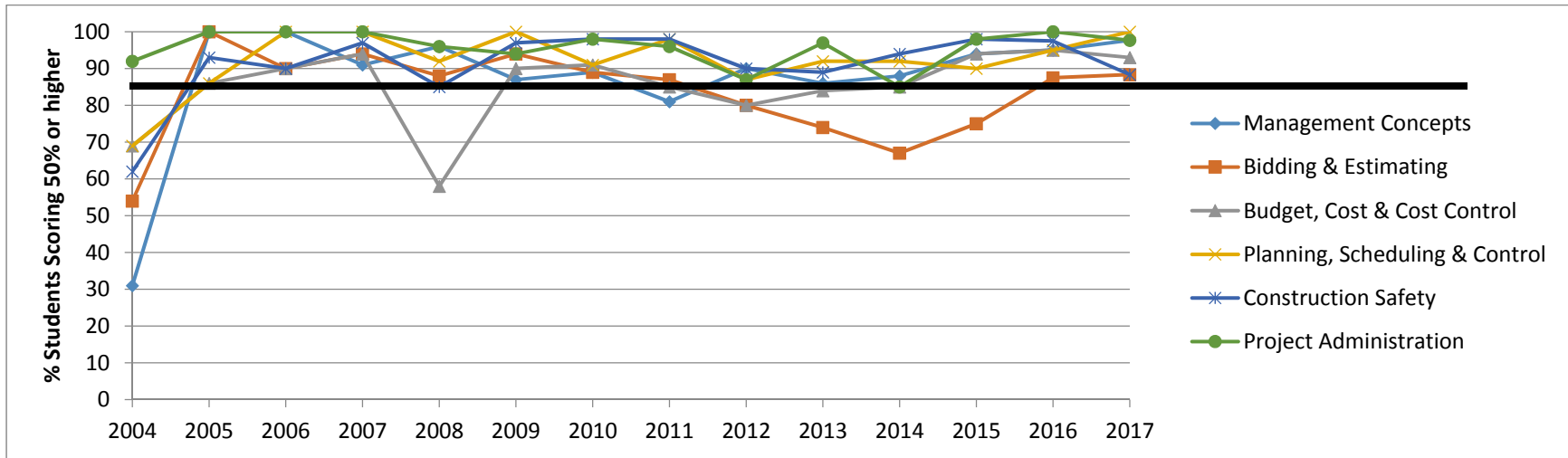


Outcome #4

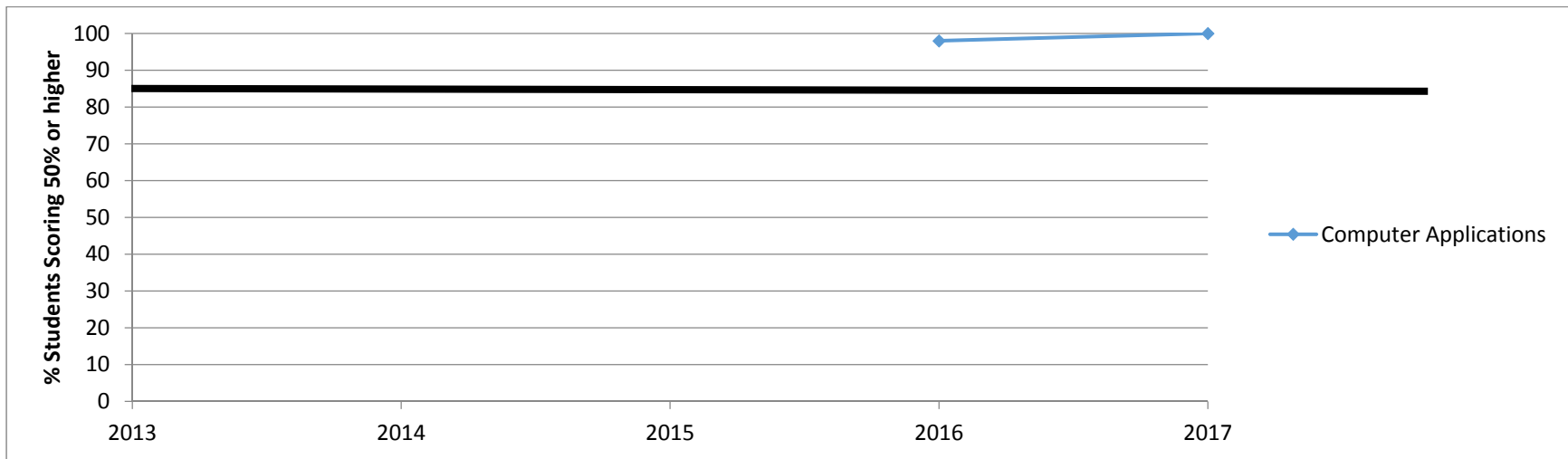
Table A-2. Primary Goal Table; Percentage of Students Scoring 50% or higher in AC Exam Topics

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
	AIC exam category related to Outcome #1 from CM program at CCSU														
1	Management Concepts	31	100	100	91	96	87	89	81	90	86	88	94	95	98
2	Bidding & Estimating	54	100	90	94	88	94	89	87	80	74	67	75	88	88
3	Budget, Cost & Cost Control	69	86	90	94	58	90	91	85	80	84	85	94	95	93
4	Planning, Scheduling & Control	69	86	100	100	92	100	91	98	87	92	92	90	95	100
5	Construction Safety	62	93	90	97	85	97	98	98	90	89	94	98	98	88
6	Project Administration	92	100	100	100	96	94	98	96	87	97	85	98	100	98
	AIC exam category related to Outcome #2 from CM program at CCSU														
1	Computer Applications													98	100
	AIC exam category related to Outcome #3 from CM program at CCSU														
1	Engineering Concepts	62	71	50	79	77	90	89	83	93	58	63	73	73	73
2	Materials, Methods & Plan Reading	92	100	70	100	81	97	95	87	93	84	85	75	93	93
3	Construction Geomatics	31	100	70	91	85	94	80	83	77	76	69	65	95	93
	AIC exam category related to Outcome #4 from CM program at CCSU														
1	Communication Skills	77	43	90	79	31	74	89	57	90	89	81	100	98	100

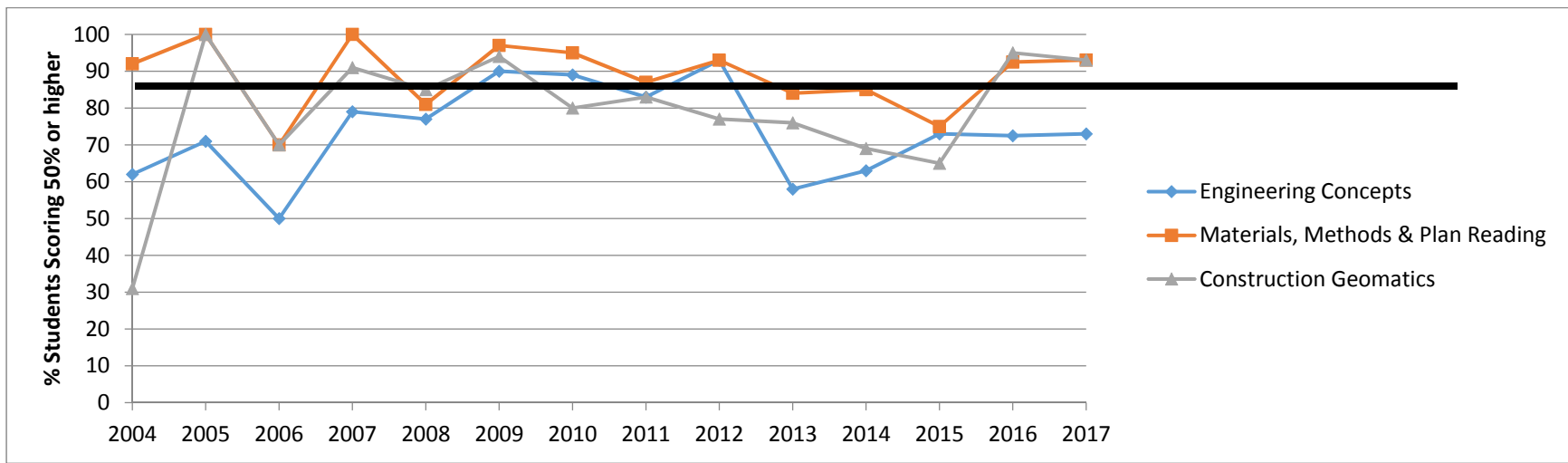
Figure A-2. Primary Goal Graphs; 85% of students scoring 50% or higher in the Learning Outcomes of the AC Exam



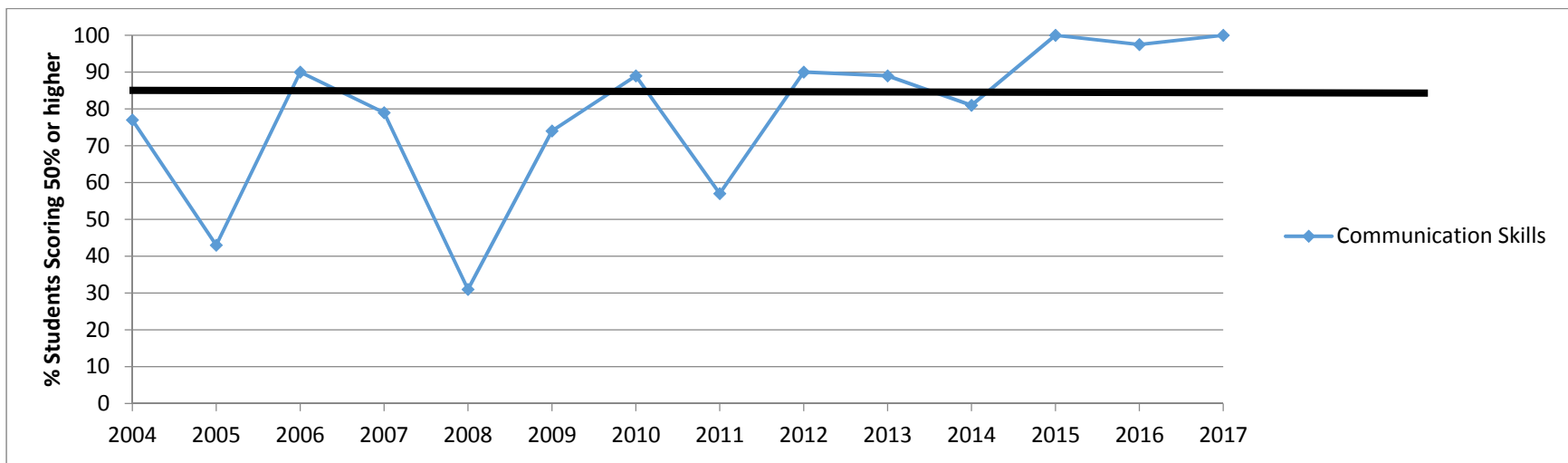
Outcome #1



Outcome #2



Outcome #3

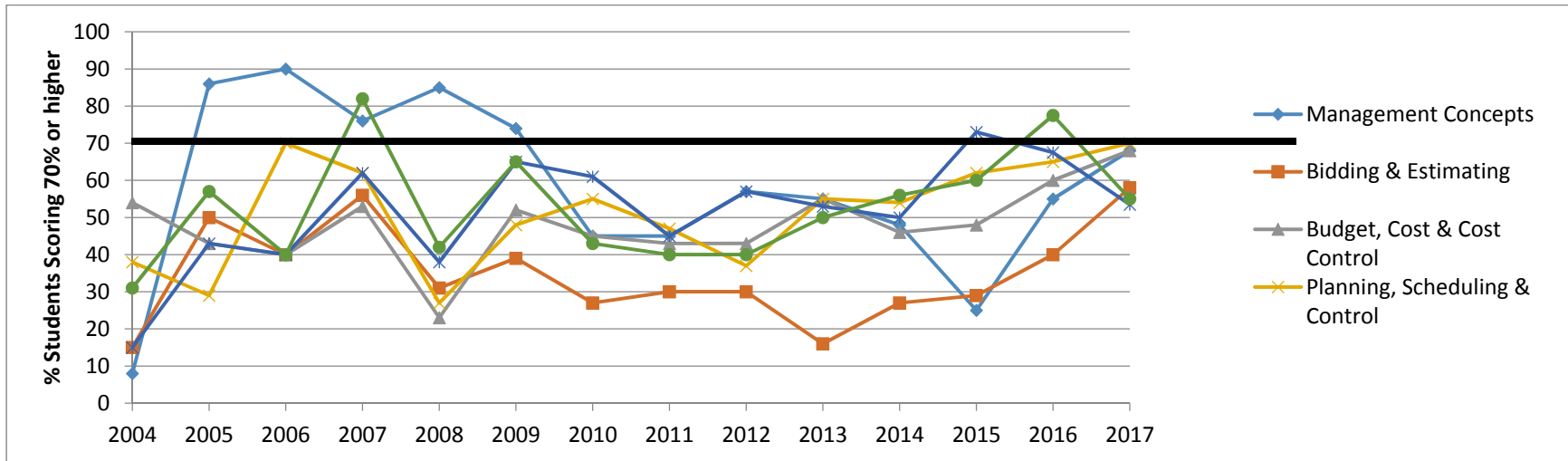


Outcome #4

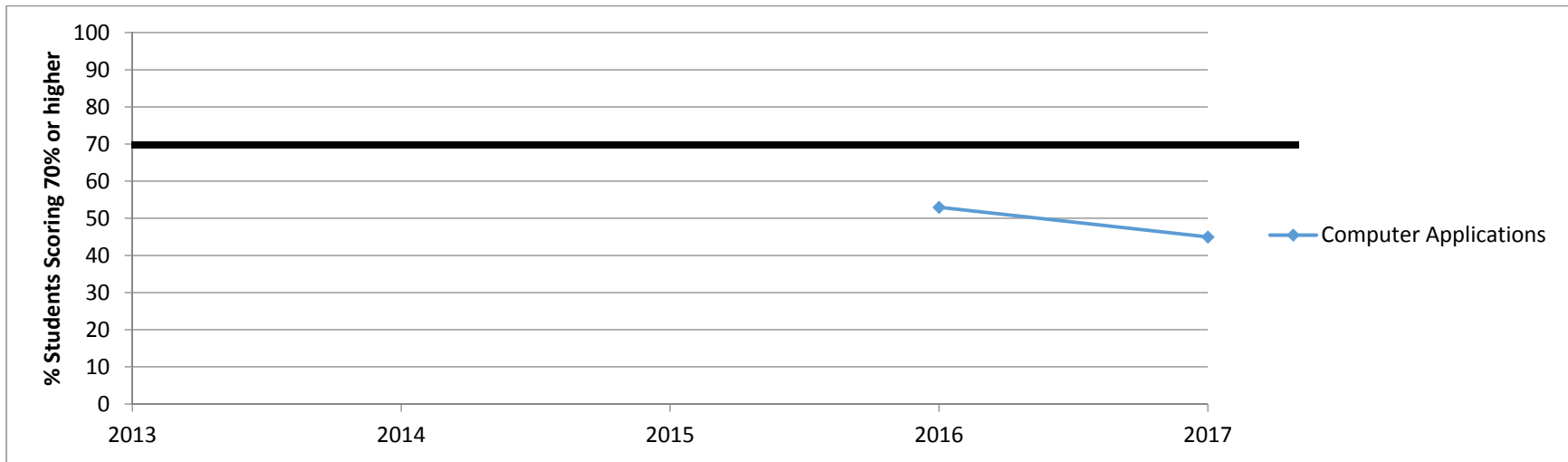
Table A-3. Secondary Goal Table; Percentage of Students Scoring 70% or higher in AC Exam Topics

		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
	AIC exam category related to Outcome #1 from CM program at CCSU														
1	Management Concepts	8	86	90	76	85	74	45	45	57	55	48	25	55	68
2	Bidding & Estimating	15	50	40	56	31	39	27	30	30	16	27	29	40	58
3	Budget, Cost & Cost Control	54	43	40	53	23	52	45	43	43	55	46	48	60	68
4	Planning, Scheduling & Control	38	29	70	62	27	48	55	47	37	55	54	63	65	70
5	Construction Safety	15	43	40	62	38	65	61	45	57	53	50	73	68	53
6	Project Administration	31	57	40	82	42	65	43	40	40	50	56	60	78	55
	AIC exam category related to Outcome #2 from CM program at CCSU														
1	Computer Applications													53	45
	AIC exam category related to Outcome #3 from CM program at CCSU														
1	Engineering Concepts	8	29	10	41	27	65	41	23	53	31	17	29	28	23
2	Materials, Methods & Plan Reading	54	36	20	74	31	61	55	28	47	34	25	42	35	48
3	Construction Geomatics	8	50	30	62	62	58	43	32	50	37	44	21	20	60
	AIC exam category related to Outcome #4 from CM program at CCSU														
1	Communication Skills	23	21	20	41	19	55	50	19	53	32	27	60	53	70

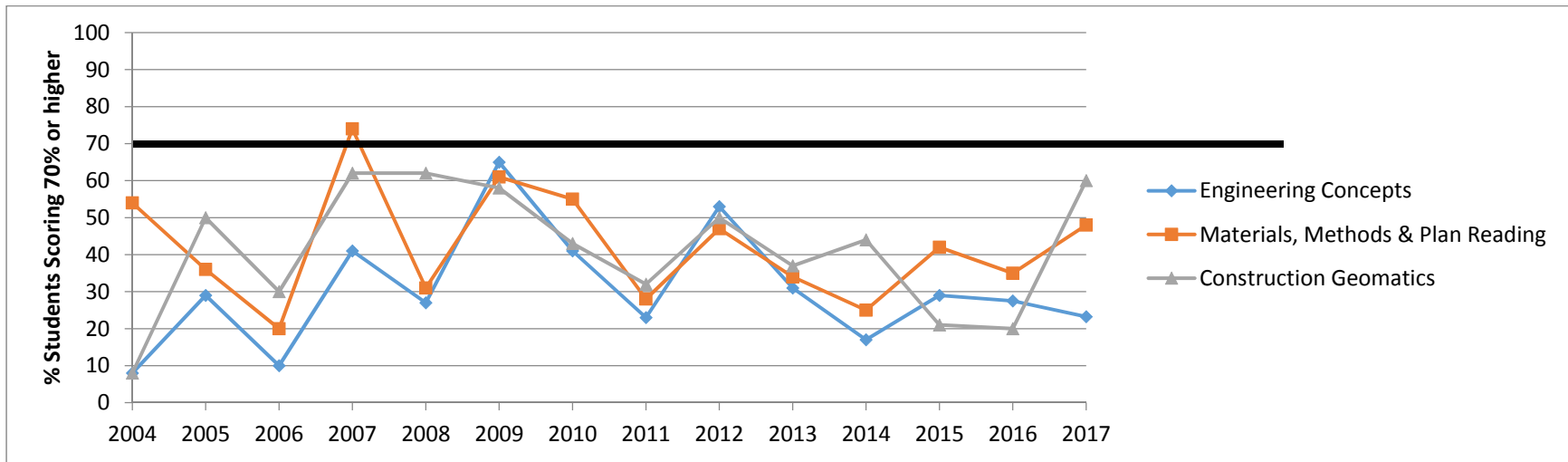
Figure A-3. Secondary Goal Graphs; 70% of students scoring 70% or higher in AC Exam Topics



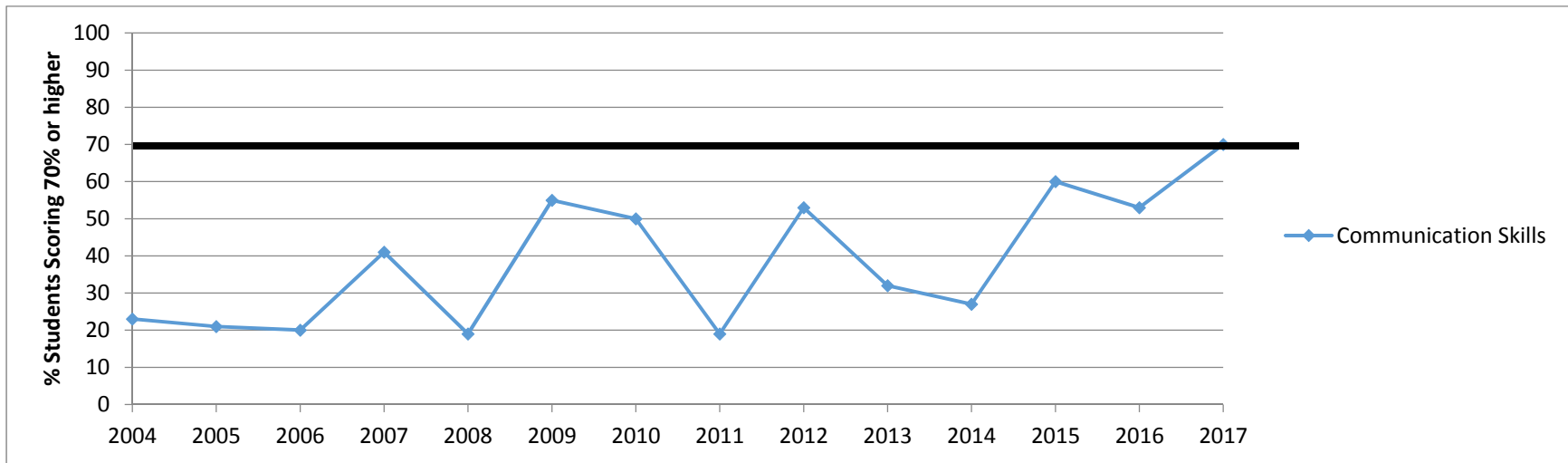
Outcome 1



Outcome 2



Outcome 3



Outcome 4

Appendix B – IAB Exit Interviews Summary

STUDENT LEARNING

Table B-1. Students Evaluation of Quality of Education Received at CM Program

	Student Learning On a scale of 1-4, how well did CCSU prepare you to:	Rank 4 = exceptional, 3 = good, 2 = acceptable, 1 = dissatisfied				Total Respondents	Average Rating
		1	2	3	4		
1	Perform the duties of an estimator, scheduler, superintendent and project manager.	0	8	22	10	40	3.05
2	Apply computers and computer software to various construction management processes.	1	11	16	12	40	2.98
3	Analyze construction materials, methods and equipment, and make appropriate decisions related to their application to the construction process.	0	3	21	16	40	3.33
4	Communicate clearly and effectively.	0	4	18	18	40	3.35
Average Rank Over All Four Categories							3.18

STUDENT COURSE WORK: Undergraduate (Quality, Quantity, Perceived Usefulness)

Internship (students' comments)

- Benefits are extremely good as that is how he found his job (had 2 internship)
- "Enjoyed and very valuable would have like to know more about print reading to be more prepared"
- "Best part of program. Learned more there than in the 4 years of classes"

One Class to Delete and Why:

- "None", "Scheduling", "Superintendancy", "Estimating" and "English", "CAD/BIM", "Construction Law", "Business Administration"

One Class to Add and Why:

- "None", "Print Reading", "BIM", "More computer classes in heavy job and bluebeam", "None", "More Math", "More MEP", and "Estimating", "CAD class"

FACILITIES

Table B-2. Students Evaluation of Facilities at CM Program

	Facilities On a scale of 1-4, how well did CCSU prepare you to:	Rank 4 = exceptional, 3 = good, 2 = acceptable, 1 = dissatisfied				Total Respondents	Average Rating
		1	2	3	4		
1	Labs - equipment and maintenance	1	12	14	12	39	2.95
2	Classrooms - layout, size, comfort level	0	5	23	12	40	3.18
3	Computer and software availability	0	7	12	21	40	3.35
4	Library usefulness	10	11	8	10	39	2.46
Average Rank Over All Four Categories							2.98

COURSE OFFERINGS

Table B-3. Students Evaluation of Courses Offered by CM Program

	Course Offerings On a scale of 1-4, how well did CCSU prepare you to:	Rank 4 = exceptional, 3 = good, 2 = acceptable, 1 = dissatisfied				Total Respondents	Average Rating
		1	2	3	4		
1	Availability of required courses	1	12	18	9	40	3.10
2	Sequencing of prerequisites	0	11	20	9	40	3.18
3	Helpfulness of Faculty Advising	0	5	15	20	40	3.88
4	Course time offering	1	11	17	10	39	3.18
5	Friday or Saturday classes	9	0	4	24	37	3.81
6	CM485	2	13	14	8	37	2.97
Average Rank Over All Six Categories							3.35

Table B-4. Students Evaluation of Summer and Online Courses Offered by CM Program

	Summer & Online Courses	Yes	No	Total Respondents	% Yes
1	Did you take any Summer classes	20	11	31	65%
2	Would you recommend to others to Summer classes	8	2	10	80%
3	Did you take any online classes	16	14	30	53%
4	Would you recommend to others to online classes	17	3	20	85%

INSTRUCTION

Table B-5. Student Evaluation of Instruction Quality at CM Program

	Faculty On a scale of 1-4, how well did CCSU prepare you to:	Rank (4 = Best)				Total Respondents	Average Rating
		1	2	3	4		
1	Full time faculty	0	0	20	20	40	3.50
2	Adjunct faculty	1	2	14	23	40	3.48
3	Texts and Software	0	6	23	11	40	3.13
Average Rank Over All Three Categories							3.37

RELATIONSHIPS TO INDUSTRY

Table B-6. Students Evaluation of Relationships to Industry Provided by the CM Program

	Relationships to Industry On a scale of 1-4, how well did CCSU prepare you to:	Rating		Total Respondents	Percentage Answered Yes
		Yes	No		
1	Career Fair attendance	34	5	39	87%
2	If yes, was attendance at the career fairs found to be useful in furthering Students' personal goals	27	6	33	82%
3	Student Clubs	27	12	39	69%
4	If yes, was Club participation deemed to have provided value to the educational experience	24	2	26	92%
5	Field Trips	21	18	39	54%
6	If yes, were field trips found to be a valuable element of education at CCSU	18	1	19	95%

Table B-7. Student Employment Placement at Graduation

	Employment Rate	Rating		Total Respondents	Percentage Answered Yes
		Yes	No		
	Reported employment in the Construction Industry lined up upon graduation:	38	2	40	95%

Table B-8. Position Offered to Student

If yes, which of the following job titles best describes what your role will be		Total Quantity	Percentage
a	Project Manager	7	18%
b	Project Engineer	16	42%
c	Estimator	5	13%
d	Scheduler	1	3%
e	Safety Manager	1	3%
f	Superintendent	2	5%
g	Other	6	16%

Table B-9. Construction Sector of Hiring Company

Jobs reported by sector of the Construction Industry		Total Quantity	Percentage
a	Construction management	13	34%
b	General contractor	9	24%
c	Specialty contractor	8	21%
d	Material supplier	2	5%
e	Owner	1	3%
f	Legal-Insurance	3	8%
g	Other	2	5%

Table B-10. Starting Salary for the Jobs Offered

Anticipated starting salary range		Total Quantity	Percentage
a	< \$45,000	0	0%
b	\$45,001 - \$50,000	3	8%
c	\$50,001 - \$55,000	4	11%
d	\$55,001 - \$60,000	11	29%
e	\$60,000	13	34%
f	Prefer not to answer	7	18%