

Academic Quality Plan

Master of Science in Construction Management
Construction Science Department
Texas A&M University

1. Introduction

- 1.1 The following is the Academic Quality Plan for the Master of Science in Construction Management (MSCM) graduate degree program at Texas A&M University (TAMU). This plan was developed in accordance with the requirements set forth by Texas A&M University and the American Council for Construction Education (ACCE), the accrediting body of the Construction programs.
- 1.2 This is a comprehensive plan for quality improvement of the program and its students through development and assessment of educational program objectives as well as student learning outcomes through internal and external measures of student achievement.
- 1.3 The educational program objectives are derived from the department's mission. Student learning outcomes are derived from the educational program objectives and ACCE guidelines.
- 1.4 The plan will be reviewed and updated periodically as justified.

2. Department Mission

- 2.1. The Construction Science Department is dedicated to education, discovery, development and application of knowledge in the field of construction while fulfilling the land grant mission of Texas A&M University and enhancing the economic development of the State of Texas. Our mission of providing the highest quality undergraduate and graduate programs is inseparable from our mission of developing new understanding through teaching, research and service. We prepare students to assume roles in leadership, responsibility, and service to society.

3. Supporting Documents

- 3.1. This Academic Quality Plan is an integral part of and is supported by the following:
 - 3.1.1. The current version of the Department Strategic Plan,
 - 3.1.2. The Department's University Assessment Plan and Report, and
 - 3.1.3. The annual COSC Academic Quality and Assessment Implementation Report.

4. Graduate Educational Program Objectives

- 4.1. The following educational program objectives are broad statements that describe the career and professional accomplishments that the program is preparing graduates to achieve. These educational program objectives are consistent with and support the overall Mission Statement.
 - 4.1.1. (Objective #1) Graduates will be prepared to recognize, rationalize, and provide solutions to problems in construction project management.
 - 4.1.2. (Objective #2) Graduates will understand the importance of information management systems and advancing technology applications in the construction industry.
 - 4.1.3. (Objective #3) Graduates will understand the impact of the built environment on the natural environment and demonstrate sensitivity to the natural environment and an understanding of sustainable construction.
 - 4.1.4. (Objective #4) Graduates will be familiar with social responsibility and ethical standards of the construction industry.
 - 4.1.5. (Objective #5) Graduates will understand the need for and the power of teams and be able to function effectively as members of teams.
 - 4.1.6. (Objective #6) Graduates will have an appreciation of human relationships in construction practice and demonstrate a commitment to fair and responsible leadership of individuals.

5. Student Learning Outcomes

- 5.1. The following student learning outcomes were developed to describe the skills and knowledge that students are expected to know and be able to execute upon graduation from the MSCM program at TAMU. These student learning outcomes support the educational program objectives and the Office of Graduate Studies' Learning Outcomes. Upon graduation, all MSCM students will:
 - 5.1.1. (Outcome #1) Demonstrate critical thinking and creativity,
 - 5.1.2. (Outcome #2) Demonstrate complex problem solving and decision making,
 - 5.1.3. (Outcome #3) Demonstrate effective professional oral and written communications,
 - 5.1.4. (Outcome #4) Be able to use information and communication technology,
 - 5.1.5. (Outcome #5) Be able to understand and apply principles of leadership in business and management,
 - 5.1.6. (Outcome #6) Have a working knowledge of current issues in construction,
 - 5.1.7. (Outcome #7) Demonstrate the ability to solve complex construction problems taking into account associated risk management issues,
 - 5.1.8. (Outcome #8) Demonstrate knowledge of construction contracts, risks, construction laws and ethics, and
 - 5.1.9. (Outcome #9) Be able to apply advanced project management principles and practices to construction projects.
- 5.2. Distribution of Student Learning Outcomes
 - 5.2.1. The identified student learning outcomes (Sections 5.1.1. - 5.1.9.) are distributed throughout the program to insure that the outcome is addressed and assessed. In some courses where concepts are practiced, students are not only assessed for what they have learned in that particular course's course objectives, but are also assessed in order to measure their proficiency in selected student learning outcomes.
 - 5.2.2. The curriculum has been designed to ensure that these student learning outcomes are fulfilled. Table 1 shows how each course in the curriculum contributes to the achievement of the student

learning outcomes. An “i” indicates that the course content introduces the student learning outcome and creates an awareness of the idea or concept. A “u” indicates the course content creates an understanding of the skills or concept at a deeper level than awareness and allows students the opportunity to practice the student learning outcome. A “w” indicates the course content creates a working knowledge of the student learning outcome allowing the students the ability to apply the process as they further practice the outcome.

5.2.3. The courses selected for outcome assessment provide significant treatment of the student learning outcome, do so in a manner that can be assessed, and complement each other when more than one course is identified for a single student learning outcome. Assessment of learning outcomes measures the student’s achievement of a particular awareness, understanding, skill, or ability at an advanced working knowledge level. An “a” indicates the course in which the student learning outcome will be assessed.

5.2.4. Table 1 shows the distribution of learning outcomes throughout the courses offered in the MSCM program.

Table 1: Distribution of student learning outcomes throughout the courses offered in the MSCM program:

Course	Description	Cr. Hrs	Student Learning Outcomes								
			1	2	3	4	5	6	7	8	9
COSC 601	Const. Practices	3						u	i	i	
COSC 602	Const. Estim.	3		i		i,u		u	i,u,w		i
COSC 603	Const. Schedul.	3		i		i,u,w		u	i,u,w		i
COSC 606	Mech. & Elec.	3		i				i	i		
COSC 608	Structures	3		i				i	i		
COSC 620	Const. Operat.	3	i	i	i,u,w		i,u,w	u,w	u,w	i	u,w
COSC 621	Adv. Scheduling	3	i	u,w		u,w		u,w	i,u,w		u,w,a
COSC 624	Proj. Acquisition	3	i	u	i,u,w		u,w	u,w	u,w		u,w,a
COSC 627	Dispute Resolut.	3	i					i,u	i,u,w	u,w,a	
COSC 628	Const. Law	3	i					i,u	i,u,w	u,w,a	
COSC 631	Supervision	3	i				u,w	u,w	i,u	i	i
COSC 633	Intern'l. Const.	3	i	u			u	u,w	i,u	i	i,u,w
COSC 641	Const. Commun.	3	i		i,u,w	u,w,a	u,w	u,w	i		i
COSC 648	Design-Build	3	i		i,u,w		u,w	u,w	i,u	i,u	i,u
COSC 650	Const. Vizualis.	3	i	u	i,u,w	u,w,a		u,w	i,u		i

COSC 663	Sustain. Const.	3	i		i,u,w			u,w	i,u		i,u
COSC 664	Safety Mgmt.	3	i					i,u,w	i,u		i
COSC 670	Facility Mgmt.	3	i		i,u,w		u,w	u,w			i,u
COSC 681	Seminar	1						i			
COSC 684	Internship	3	w	w	i	i	w	W	w	i	w
COSC 689	Special Topics*	3									
COSC 690	Research Theory	3	i,u	u,w				i,u	i,u		i
COSC 691	Research	4+	u,w,a	w,a	w,a		u,w,a	w,a	w,a	w,a	u,w,a
COSC 693	Profess. Study	2+	u,w,a	w,a	w,a		u,w,a	w,a	w,a	w,a	u,w,a

* - Vary by course content.

6. Internal Assessment Tools

Various tools will be used internally to assess student learning outcomes. The key to determining whether outcomes are being met is to develop quantitative measures of student performance that span the nine outcomes listed above. Tools for internal assessment of outcomes follow.

6.1. Course examinations, reports or projects

6.1.1. The primary course-level assessment tool that will be used in the MSCM program is the examinations, reports or projects, or a combination of them in each course.

6.1.2. At the conclusion of each semester, course assessment data is collected by each instructor and forwarded to the Graduate Program Coordinator. The Graduate Program Coordinator is responsible to summarize data from each instructor and then present these summaries to the Graduate Instruction Committee and the Department Head. The summaries shall include the following:

6.1.2.1. A brief summary of the exam or project content.

6.1.2.2. An assessment of student performance on a question-by-question basis or, alternatively, on a topic-by-topic basis that will include comparisons between student achievement and established metrics for the questions or topics covered in the exam (typically a target pass rate of 70% on each question unless otherwise noted).

6.1.2.3. Recommendations for changes to the course content, if any, based on any deficiencies observed.

- 6.1.3. Following review and concurrence by the Graduate Instruction Committee and the Department Head, the exam or project summaries are included as part of the annual assessment report for the department.
- 6.2. Course summary and improvement form and course notebook
 - 6.2.1. The Course summary and improvement form and course notebook will be a course level assessment tool that documents the student assessment process and serves as a tool to assess the course. This tool assesses the effectiveness as well as the relevance of the content in each COSC course offered. Each instructor of a course completes a Course summary and improvement form at the completion of each semester. The Course improvement form will be accompanied by a notebook of relevant material from the course including the course syllabus, exams, quizzes, assignments and examples of student work. The form and notebook will document the extent that the student learning outcomes in paragraph 5.1 have been met.
 - 6.2.2. The improvement form and course notebook will then be given to the Graduate Program Coordinator for review and action. The Graduate Program Coordinators will summarize the data for each course and present these summaries to the Graduate Instruction Committee and the Department Head or designee. The Graduate Program Coordinator summary shall include recommendations for changes to the course content, if any, based on any deficiencies observed.
 - 6.2.3. Following review and concurrence by the Graduate Instruction Committee and the Department Head, the summaries and recommendations are presented to the graduate faculty at their next meeting for review and approval. Following review and approval, the Department Head will include these summaries and recommendations as part of the annual Quality Improvement and Assessment Report (annual report) for the department.
 - 6.2.3.1. The curriculum will be managed to maintain consistency while allowing for constant updates and improvement.
 - 6.2.3.2. The entire curriculum will undergo rigorous review every third year by the Graduate Instruction Committee.
 - 6.2.3.3. The Graduate Instruction Committee will identify clear core requirements, learning objectives, outcomes, and expectations for each course.

6.3. Exit surveys

6.3.1. An exit survey opportunity will be given to all MSCM students immediately prior to their graduation, soliciting their opinions with respect to their educational experiences at TAMU. A 50% response rate is expected. The survey contains questions regarding the student learning outcomes and the responses will be used to assess and evaluate these student learning outcomes and to formulate plans for taking corrective action or for making improvements.

6.3.2. Students will be asked to self-assess each of the 9 outcomes on a scale of 1 (weakness) to 5 (strength).

6.3.2.1. Students self-assessment scores on at least six out of the nine student learning outcomes will average at least a 3.2 score.

6.3.3. Students will be asked if they are satisfied with their education and choice of Construction Management as a major.

6.3.3.1. At least 60% of students responding will indicate satisfaction.

6.3.4. Students will be asked about their internship experience (if occurred) in their degree program.

6.3.4.1. At least 75% of students responding will indicate satisfaction.

6.3.5. The Industry Relations Coordinator, in conjunction with the Graduate Program Coordinator, have several responsibilities with regard to the graduate student exit surveys:

6.3.5.1. Annually review and update the questions used in the survey to ensure that they correlate with the current list of objectives and outcomes.

6.3.5.2. Tabulate the responses. This data shall be summarized in the annual COSC Assessment Report.

7. External Assessment Tools

Various tools will be used externally to assess student learning outcomes. The key to determining whether outcomes are being met is to develop quantitative measures of student performance that span the nine outcomes listed above. Tools for external assessment of outcomes follow.

7.1. Former student surveys

- 7.1.1. Former student surveys are sent to all TAMU graduates every five years. The survey contains questions regarding the educational program objectives and student learning outcomes. The responses will be used to assess and evaluate these objectives and outcomes, and to formulate plans for taking corrective action or for making improvements.
 - 7.1.1.1. The survey is administered in such a way as to gather information correlated by the time subsequent to degree. Consequently, the responses from recent graduates will be viewed separately from those transitioning from entry-level positions, to more responsible positions, to senior positions.
- 7.1.2. Former graduate students will be asked to self-assess each of the nine student learning outcomes on a scale of 1 (weakness) to 5 (strength).
 - 7.1.2.1. Former students self-assessment scores on at least six out of the nine student learning outcomes will average at least a 3.2 score.
- 7.1.3. Former students will be asked if they are satisfied with their education and choice of Construction Management as a major.
 - 7.1.3.1. At least 60% of former students responding will indicate satisfaction.
- 7.1.4. The Industry Relations Coordinator, in conjunction with the Graduate Program Coordinator, have several responsibilities with regard to the former student surveys:
 - 7.1.4.1. Prior to each survey review and update the questions used in the survey to ensure that they correlate with the current list of objectives and outcomes.
 - 7.1.4.2. Tabulate the responses. This data shall be summarized in the annual COSC Assessment Report for the year in which the survey is conducted.

7.2. Employer surveys

- 7.2.1. Employer surveys will be mailed to the employers of COSC graduates and interns every five years. The survey contains questions regarding the educational program objectives and student learning outcomes. The responses will be used to assess and

evaluate these objectives and outcomes and to formulate plans for taking corrective action or for making improvements.

- 7.2.2. The Industry Relations Coordinator has several responsibilities with regard to the employer surveys:
 - 7.2.2.1. Prior to each survey review and update the questions in the survey to ensure that they correlate with the current list of objectives and outcomes.
 - 7.2.2.2. Tabulate the responses. This data shall be summarized in the annual COSC Assessment Report for the year in which the survey is conducted.
- 7.3. Job placement records
 - 7.3.1. Job placement records are a measure of the educational value received by COSC students as perceived by employers. Although not specifically linked to any listed objective or outcome, the placement records are a measure of how the MSCM program is doing with respect to the overall mission. A summary of the placement records will be tracked on an annual basis to formulate plans for taking corrective action or for making improvements.
 - 7.3.2. The Industry Relations Coordinator shall obtain placement data for the graduating graduate students each year. This data shall be summarized in the annual COSC Assessment Report.
 - 7.3.3. The department will maintain a placement rate for the graduating graduate students seeking employment that is competitive with the placement rates of the best programs in construction.
 - 7.3.4. The starting base salary of graduating graduate students shall be competitive with salaries in related disciplines and the best programs in construction.
- 7.4. Construction Industry Advisory Council reviews and feedback
 - 7.4.1. The Department will hold meetings at least twice per year with members of the Construction Industry Advisory Council (CIAC). One of the main tasks of the CIAC is to assess the MSCM program with respect to the educational program objectives and student learning outcomes.
 - 7.4.2. All courses will undergo an in-depth review of course objectives, student learning outcomes, topics, and content by industry every four years.

- 7.4.2.1. CIAC members will report to the Department Head that they are satisfied overall.
- 7.4.3. Once each year CIAC members will meet with student focus groups to obtain feedback from the students' perspective of the graduate program.
 - 7.4.3.1. CIAC members will report to the Department Head that they are satisfied overall.
- 7.4.4. The Industry Relations Coordinator will prepare meeting minutes that will document the content of the discussions and will highlight specific recommendations that will be addressed and implemented to improve the MSCM program. In particular, the minutes shall reflect any input the CIAC members may give to the MSCM Program regarding curriculum changes, objectives and outcomes.

8. Matrix of Learning Outcomes and Assessment Tools

- 8.1. The student learning outcomes (Sections 5.1.1. - 5.1.9.) are assessed using both internal and external assessment tools. Each student learning outcome is assessed by at least three assessment tools.
- 8.2. Table 2 shows the distribution of assessment tools used to evaluate each of the student learning outcomes.

Table 2: Distribution of assessment tools to evaluate each of the student learning outcomes:

		Student Learning Outcomes									
		1	2	3	4	5	6	7	8	9	
Assessment Tools	Internal	Course examinations, reports or projects	X	X	X	X		X	X	X	X
		Course summary and improvement form and course notebook	X					X			
		Exit surveys			X			X			
	External	Former student survey		X	X	X	X	X	X	X	X
		Employer survey	X	X	X	X	X	X	X	X	X
		Job placement records			X			X	X		
		CIAC review					X	X	X	X	X

9. Feedback and Use of the Academic Quality Plan and Assessment Implementation

- 9.1. The Department Head will summarize these results in an annual Academic Quality Assessment Implementation Report due September 1 of each year in accordance with TAMU's Assessment Process and ACCE's Assessment Process. This Academic Quality Assessment Implementation Report consists of the following:
 - 9.1.1. The current version of the Department Strategic Plan.
 - 9.1.2. The current version of the Academic Quality Plans for the graduate program.
 - 9.1.3. The annual COSC Academic Quality Assessment Implementation Report.
 - 9.1.3.1. The main responsibilities for interpretation of results and recommendations for changes lie with the Department Head and his/her designees (the Graduate Program Coordinator.) Regular meetings of the Graduate Instruction Committee are held each semester to review assessment data, and an annual meeting of the Graduate Instruction Committee is held to review Program Educational Objectives and Student Learning Outcomes.
 - 9.1.4. Recommendations for improvement based on the findings of the Assessment Report shall be prepared by the Department Head and submitted to the faculty for consideration.
 - 9.1.5. Once approved by the faculty, recommendations shall be implemented the following semester.