Department of Civil Engineering & Applied Mechanics

College of Engineering and Computer Science

California State University-Northridge

Northridge, CA

Construction Management Technology Program

PROGRAM PUBLIC INFORMATION

I. PROGRAM ACADEMIC QUALITY PLAN

A. Program Quality Assessment

Introduction

The purpose of this document is to define the quality improvement process for the academic program of the Construction Management Technology Program (CMT) at California State University Northridge. The program is housed within the Civil Engineering & Applied Mechanics Department. A continuous improvement process was designed to meet the needs of the CMT program.

An important element of an improvement process is to measure performance according to a set of defined outcomes that can be defined with measurable performance. Many of the components used for performance measurement have existed at California State University Northridge. In particular it is required that an annual assessment report be completed for the university system. However, that reporting mechanism does not necessarily include all the possible constituents of the process. The CSUN Construction Program Improvement Process (CPIP) requires input from a wide range of sources including, but not limited to the Advisory Industry Board, faculty, students, and alumni. The role of each group in performance assessment will be discussed to ensure clear communication of goals and objectives.

Background

The continuous process starts with a clear focus on the vision and mission of the CMT Program. This vision is closely alignment with the vision and mission of the College of Engineering and Computer Science, and the University and is an important element in defining the educational objectives of the CMT Program. Appropriate survey instruments and evaluation procedures will be provided. In addition to the education and curriculum issues, the advising process will also be shown in its role and processes.

California State University Northridge's Mission

http://www.csun.edu/academic.affairs/csunmission.htm

"California State University, Northridge exists to enable students to realize their educational goals. The University's first priority is to promote the welfare and intellectual progress of students. To fulfill this mission, we design programs and activities to help students develop the academic competencies, professional skills, critical and creative abilities, and ethical values of learned persons who live in a democratic society, an interdependent world, and a technological age; we seek to foster a rigorous and contemporary understanding of the liberal arts, sciences, and professional disciplines."

College of Engineering and Computer Science's Mission

http://www.ecs.csun.edu/ecsdean/mission.html

"The College of Engineering and Computer Science seeks to be a recognized center for excellence for baccalaureate and masters education in computer science and in engineering. The College provides a quality education for its students. It is also a partner in the professional communities of computer science and engineering and provides an essential link between students' education and professional practice."

CMT Program's Mission

https://www.csun.edu/~ceam/cmt_mission_statement.html

"The construction management industry is a diverse and global group of professional constructors and trade organizations providing a service to owners and the capital projects being undertaken. Professional construction managers are contracted to perform management and project control procedures. Students in construction management will develop the skills, knowledge, and thought processes needed to successfully complete construction projects on time and within budget, adhering to construction standards and safety guidelines. Students will learn the fundamentals of construction management, project control, and technical skills in graphics, materials, equipment, planning & scheduling, finance, and estimating. Graduates are expected to make a smooth, seamless transition into the construction industry. Graduates will find employment in commercial, design build, heavy civil and residential applications of the construction industry."

Program Objectives

- Enable students to become motivated, well-versed in construction management, and have the requisite skills needed to become leaders of the construction industry.
  1. *Graduates will successfully demonstrate the managerial skills to organize and control construction projects from conception to closeout.*
  2. *Graduates will develop innovative thinking processes and creative problem solving skills.*
  3. *Graduates will develop leadership capabilities through practical application and team building techniques.*
- Offer a program with external networking capabilities that develop oral and written

communications skills.

1. *Graduates will be introduced to the society and environment of the construction and related industries.*
2. *Graduates produce evidence of strong communication skills and delivery.*

- Provide resources that will create a rich educational environment.
  1. *Provide an environment conducive to student and faculty development.*
  2. *Provide the required facilities, laboratories, equipment, computer applications and external support for course and program development.*

Student Learning Outcomes

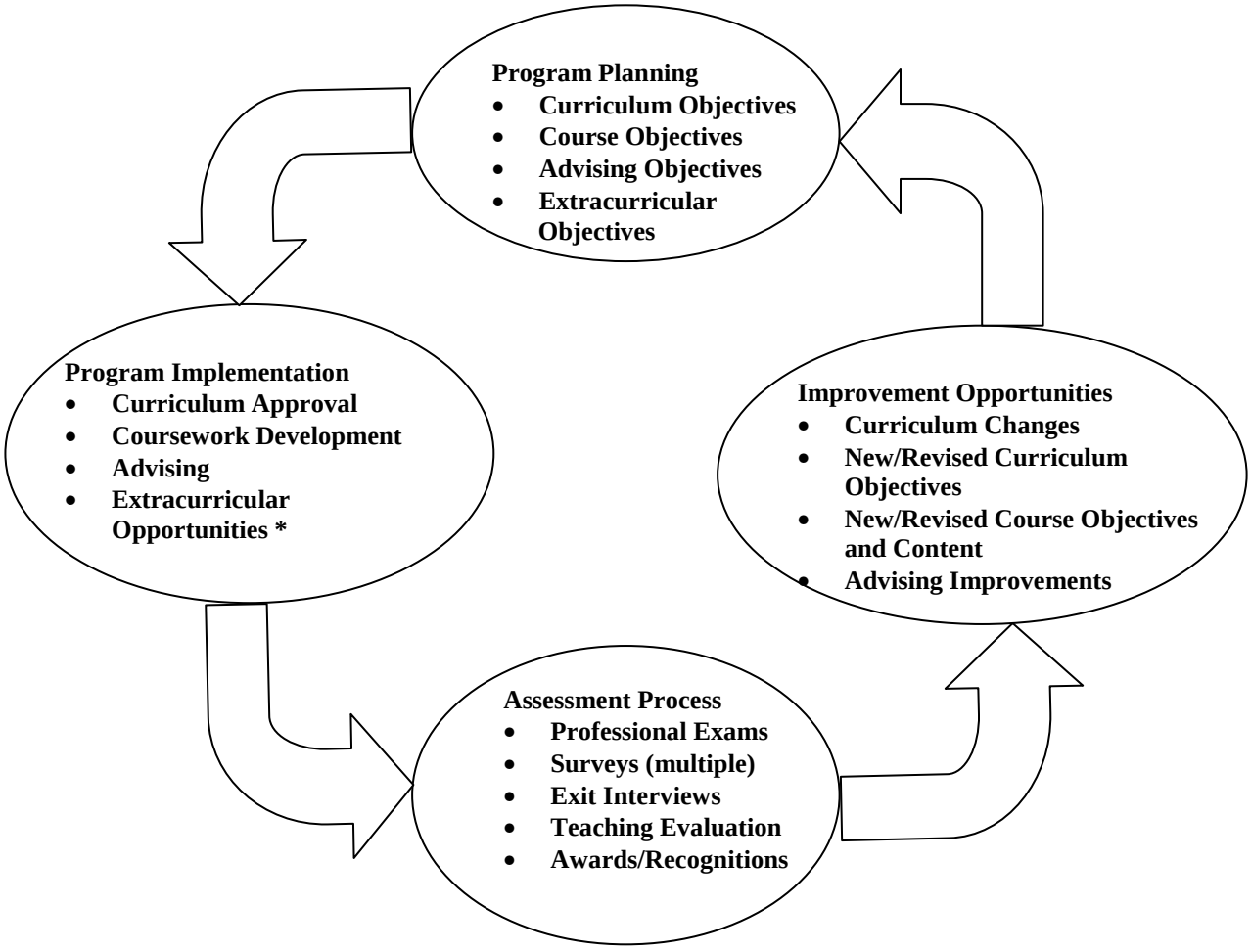
Graduates of the Bachelor of Science in Construction Management Technology program at California State University, Northridge will have the following learning outcomes:

a. an ability to demonstrate an appropriate mastery of the knowledge, techniques skills and modern tools of their disciplines
b. an ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering, and technology
c. an ability to conduct, analyze, and interpret experiments and apply experimental results to improve processes
d. an ability to apply creativity in the design of systems, components, or processes appropriate to program objectives
e. Function effectively on teams.
f. an ability to identify, analyze, and solve technical problems.
g. an ability to communicate effectively.
h. an ability to recognize the need for and possess the ability to pursue lifelong learning
i. an ability to understand professional, ethical, and social responsibilities
j. an ability to recognize contemporary professional, societal, and global issues and aware of and respect diversity
k. an ability to have a commitment to quality, timeliness and continuous improvement.
l. knowledge of construction contracts, documents, specifications and codes
m. knowledge of construction methods and materials
n. knowledge of construction surveying
o. knowledge of statics and strength of materials
p. knowledge of material quantity and cost estimates of projects
q. knowledge of productivity software to solve technical problems
r. knowledge of construction accounting and economics
s. an ability to utilize modern instruments, methods and techniques
t. knowledge of construction law and ethics
u. knowledge of soils, and foundations
v. knowledge of scheduling and project management
w. knowledge of construction safety

Process Model

The process model in Figure 1 illustrates the planned assessment process. The initial planning element is the curriculum in place at the implementation of this procedure – Fall 2005. Program objectives have been defined and educational objectives developed from the curriculums in place at that time. Course objectives have been coordinated with the program educational objectives

Figure 1 - Construction Management Technology Improvement Process Model



Program Planning

The program planning phase consists of revision of curriculum objectives, course objectives, advising objectives, and extracurricular objectives. The program planning activities will be conducted on an annual basis by the faculty, based on input from the appropriate constituencies. The primary focus for this planning effort would be to evaluate the need to revise our overall Educational Objectives. This is critical because these elements are essential parts by which we measure our performance. Plus, the program planning assist in evaluation of the coursework and how well the courses are meeting the Educational Objectives. Extracurricular activities include the non-curricular activities of the Program that are important to leadership and professional development of the students. Student chapter advising, Habitat for Humanity, and projects are all elements of extracurricular activities. The advising process is also subject to review and evaluation in conjunction with the overall program plan. A high quality advising process ensures that the academic requirements are met by each student and will provide a benchmark for periodic checks on their progress.

The faculty will primarily be responsible for program planning, but will act on the basis of input from the Industry Advisory Board (IAB) and student representatives from active student chapter membership. The major changes to curriculum requirements need to be planned to coincide with the submission of the course catalogs. The catalogs are released in a two-year cycle.

Program Implementation

The implementation phase consists of curriculum approval, coursework development, advising, and extracurricular opportunities implementation begins with approval of the curriculum content as defined by outcome of the biannual department meeting of the faculty. Implementation requires final approval of the curriculum as recommended by the Program Planning process. Where necessary new courses will be developed for the two-year planning process and existing courses modified to accommodate the recommendations. Under unique situations, an interim catalog change can be introduced if dictated by the planning process. Changes will not be reflected in the catalog until next edition is issued. This permits some curriculum planning flexibility, but the goal is to confine major changes to the two-year planning cycle. The advising process recommendations from the planning process will be implemented immediately. Extracurricular improvement will be implemented at the end of the spring semester to ensure they are included in the planning process by newly elected student chapter officers.

Assessment Process

The assessment phase consists of professional exams, surveys (multiple), exit interviews, teaching evaluation, and awards/recognitions. Professional exams were recommended but not mandated. Some students took professional exams as shown in Table 9.1. The assessment process, so far, is based on information from exit interviews and surveys, and alumni themselves. National examination (Certified Professional Constructor) is implemented starting Fall 2009. AC Exam will be a mandatory requirement in the senior design course (CMT 488A). However, passing the test is not mandatory so it will be a good assessment tool. Employer surveys have been developed to obtain feedback on each degree program criteria. Surveys are sent to graduates who have been employed for two years in the industry. Their employers have

to fill their share of the survey for student's evaluation. Alumni surveys are sent out to graduates who have been employed for more than a year. Graduating seniors are asked to complete a formal exit interview and survey on education criteria and they will be asked to participate in exit interviews to be conducted by the department chair. Starting Spring 2010, exit interview will be conducted by the CMT program director. Moreover, informal interview and discussions with industry board, employers, alumni, and seniors are conducted to get any feedback that is not recorded in surveys. Feedback on the program and extracurricular activities will be collected from this exit interview. Teaching evaluations also provide some feedback on areas needing improvement for courses as well as professional development in improved instructional techniques. Table 9.2 summarizes the survey based assessment tools and frequency of data collection.

Table 9.1. Professional exams statistics

Professional Exams	*Agency*	*Students Attempted*	*Students Passed*	*Year*
AC Level 1	*American Institute of Constructors*	*12*	*6*	*2011-2012*
AC Level 1	*American Institute of Constructors*	*23*	*7*	*2010-2011*

Table 9.2. Surveys used in assessment

SURVEY	*TARGET*	*FREQUENCY*
Alumni	*Graduates of the program who have been working at least 2 years.*	*Every two years.*
Employers	*Employers of recent graduates. Recent graduates are those who have been employed for two years.*	*Every two years*
Exit Interviews	*All graduating seniors from the programs*	*Each Fall and Spring semester*

Two measures will be available for comparison.

- Year 0 – the graduating senior
- Year 2 – the alumni evaluations and the employer evaluation after 2 years of exposure to graduates

Graduating classes can be difficult to track and the University Alumni Association tries to maintain an accurate database.

Improvement Opportunities

The improvement phase consists of curriculum changes, new/revised curriculum objectives, new/revised course objectives and content, advising improvements. The feedback obtained from the informal interviews, industry board, employers, surveys and exit interviews provides guidance to areas needing improvement. Correlations among the surveys and trends are evaluated to measure progress toward planned improvements. The feedback may indicate where significant changes are needed. Table 9.3 categorizes the feedback data obtained from the assessment tools and how the information will be used as input to the planning process.

Table 9.3. Use of Assessment Feedback for Planning

ASSESSMENT SOURCE	*DATA OBTAINED*	*PLANNING INPUT*
Employer Surveys	Outcomes Evaluation	Overall Curriculum Evaluation
Alumni Surveys	Outcomes Evaluation	Overall Curriculum Evaluation Coursework
Graduating Senior Survey	Outcomes Evaluation Advising Experiences Extracurricular Experiences	Overall Curriculum Evaluation Coursework Advising Process Extracurricular Program Contribution
Exit Interviews	Advising Experiences Extracurricular Experiences Overall Student Development	Coursework Extracurricular Program Contribution Advising Process
Course Evaluations	Teaching Performance Course Functionality	Coursework Overall Curriculum Evaluation
Professional Examination Section Scores	Percent passing individual sections of professional exams	Focus areas needing improvement directly related to CM course content

Each outcome: curriculum, individual courses, advising, and extracurricular contributions; has at least two different measurements associated with them. These measurements are student's course evaluation, graduating senior surveys, and alumni survey. The advising process and extracurricular activities are measured via – graduating seniors. It would be expected that correlation should exist between the two sets of responses. The survey process represents a measure while the exit interviews will focus on issues and improvement suggestions for advising and extracurricular activities.

Most Recent Assessment Results

1. *Provide a summary of the most recent assessment cycle, including a description of the process used to evaluate both inputs and outcomes, and a summary of the results.*

   In 2008, the CMT program undertook a review of its mission, objectives, and goals in the context of both external and internal developments. The program first developed its mission statement in 2003 when the program was initiated. The program was again reviewed during the 2007-2008 academic year. Several key activities were conducted as part of assessing the CMT program including: 1) reviewing the requirements of ACCE and comparing them to the mission, educational objectives, and outcomes of the program; 2) the Construction Management Alumni and Industry Advisory Board were consulted and asked for opinion of the needed changes; 3) discussing the changes with the department faculty and getting their feedback; 4) assessing the current CMT curriculum for industry trends and consistency with the objectives and outcomes and finally 5) preparing for the ACCE reaccreditation self study.

   The CMT faculty met approximately 10 times during the year to discuss curriculum, propose possible changes and new courses, and gather input for the ACCE report. The current curriculum, possible curriculum changes, integrative course ideas and ACCE curriculum requirements were presented to the faculty members of the department for input and feedback.

Senior Exit Survey

The senior exit surveys were conducted during the senior design class. A department standard form was given to every student to fill. Table 9.4 is the summary of senior construction management student exit survey and interview questions for the past 2 years. Numerical system for answering the survey questions was not used in the exit survey interview form and the questions were formatted for a long answer to ensure understanding of any raised issue by students so it can be easily resolved. These are felt to be key indicators of current performance in most of the goal areas. Strong agreement with the survey statement yields a value of 5.0. The target performance value in this table is to maintain all categories above 2.5 score. This only implies that the respondents were between neutral and agreeing with the statement. When a 2.5 score has been recorded it is first compared with previous year responses. In some cases known actions have occurred or changes in faculty in specific areas may be the influence. Supporting anecdotal data from the exit interviews is used to see if there are other causal features not immediately apparent from the survey data.

Table 9.4. CMT Senior Exit Survey and Interviews

No.	*Question*	*Sp 2008*	*Sp. 2009*
1	Which mathematics and physics classes did you find most important to your major and which one do you feel you use least?	NA	NA
2	Which courses in the construction management technology program do you feel have been very useful and well presented?	NA	NA
3	Which courses in the construction management technology program do you feel have not been useful?	NA	NA
4	Which courses not included in your construction management technology program at CSUN do you feel would have been useful?	NA	NA
5	Do you think you had enough tools (software) and computer skills in the construction management technology program? If not, what other software would you like to see used?	4.5	3.5
6	Can you elaborate on your construction management senior-year design project? How well prepared were you for senior design project?	4.7	4.9
7	Do you think our laboratory equipment and computers are adequate? If not, what would you like to see added? What classes would you like the computers and equipment to support?	5.0	5.0
8	How do you feel about the availability of our labs? Is it adequate? If not, why?	5.0	5.0
9	What general education courses did you find to be the most helpful in your employment and/or major? Which ones help you to communicate effectively?	NA	NA
10	Do you have problems with the schedule of classes offered? Why?	4.6	4.8
11	Have you received adequate advisement on courses in your construction management technology major? What about your advisement for general education classes?	5.0	5.0
12	Comment on the service that you have received from the library.	5.0	5.0
13	Comment on the services that you have received from various	5.0	5.0

	support offices on campus such as admissions and records, financial aid, parking, etc.		
14	How do you feel about your treatment as a student here at CSUN? What was your introduction to the campus like?	5.0	5.0
15	Have you taken the CPC Level 1 exam? If yes, did you pass? If no, are you considering it in the near future?	NA	NA
16	Have you taken any construction management professional exam? If yes, what is it and did you pass? If no, are you considering it in the near future?	NA	NA
17	Do you believe your training here at CSUN properly prepared you for the CPC Level 1 exam?	5.0	5.0
The following questions are addressed at the construction management technology criteria for accreditation			
18	How do you feel about your ability to apply what you have learned in your mathematics, science, and engineering courses?	4.5	4.6
19	Can you do laboratory work that involves the design and conduct of experiments and the analysis and interpretation of experimental data to improve processes?	4.5	4.5
20	How well are you able to communicate in written and oral presentations?	4.8	4.9
21	How well can you function on teams?	5.0	5.0
22	Describe the professional and ethical responsibilities of construction management profession.		
23	Has the curriculum, here at CSUN, exposed you to the understanding of professional practice issues such as: procurement of work and bidding verses quality of work performed? How the design professionals and the construction professional interact to construct a project? The importance of professional licensure and continuing education?	4.8	5.0
24	How would you rate you ability to use the techniques, skills, and modem tools necessary for construction practice?	4.1	4.3
25	Do you believe that you have a knowledge or proficiency in those areas: scheduling, project management, estimating, construction law, contracts and documents, surveying, construction materials and methods?	5.0	5.0
26	Do you believe that you have knowledge in these areas of civil engineering: statics and strength of materials, structural and pavement design, soils, foundation?	5.0	5.0
27	Do you believe that you got enough education in construction safety?	5.0	5.0
28	Do you believe you got enough education in construction accounting and economics?	4.7	4.9
29	How would you rate your knowledge of contemporary professional, societal and global issues and your awareness and respect of diversity?	4.0	4.1

Based on the exit surveys and more important the senior exit interviews, a number of changes were implemented in the program since 2006 such as:

- Adding CMT 240 to introduce students to construction phases and techniques and increase the knowledge of methods of construction
- Using Primavera Enterprise (P5 & P6) in addition to MS Project
- Using simpler projects for the estimating class to ensure understanding of the estimating basics
- Teaching the estimating class CMT 310/L as a corequisite to the scheduling class CMT 312/L and using the same project to simulate the actual integrated process of scheduling and estimating in real life.
- Adding blueprint reading course to enhance estimating capabilities and reading of drawings
- Senior design class was restructured and reassigned to a full time faculty to teach starting Fall 2009 as students complained of the quality of the part time faculty that was brought from industry to add the industry flavor to the design.
- Updating the contents of CMT 441 to cover highway design instead of structural design II
- Changing pre requisite of some classes based on their content and to make sure students are being prepared correctly for each class.
- Adding a seminar class CMT 449 Dispute Prevention
- Adding a Construction Equipment & Method Class CMT 334 to ensure better understanding of equipment used in construction

Students' Class Evaluation

Student class evaluation is a valuable tool for a teaching institution such as CSUN. The program uses this tool to evaluate the efficiency of the teaching methods that are implemented in the course. The university sets the evaluation on a scale of 7 with 7 as very satisfied and 1 is very dissatisfied. The department consider above 4 is a target and falling below 4 would implement a problem and the faculty will be asked for explanation. Data is shown in table 9.6

Alumni Survey Results

Table 9.7 is the summary alumni surveys in 2006 and 2007.

Table 9.7. CMT Alumni Survey (Spring 2008 & Spring 2009)

Alumni from 2006 & 2007 were asked to indicate their skills compared to the following program goals:			
GOAL	***GOAL DESCRIPTION***	***SKILL LEVEL***	
		2006	***2007***
A	*Demonstrate an appropriate mastery of the knowledge, techniques skills and modern tools of their disciplines*	*4*	*5*
B	*Apply current knowledge and adapt to emerging applications of mathematics, science, engineering, and technology*	*5*	*4*
C	*Conduct, analyze, and interpret experiments and apply experimental results to improve processes*	*4*	*5*
D	*Apply creativity in the design of systems, components, or processes appropriate to program objectives*	*4*	*5*
E	*Function effectively on teams.*	*5*	*5*
F	*Identify, analyze, and solve technical problems.*	*5*	*5*
G	*Communicate effectively.*	*5*	*5*

H	*Recognize the need for and possess the ability to pursue lifelong learning*	*4*	*5*
I	*Understand professional, ethical, and social responsibilities*	*5*	*5*
J	*Recognize contemporary professional, societal, and global issues and aware of and respect diversity*	*4*	*5*
K	*Have a commitment to quality, timeliness and continuous improvement.*	*5*	*5*
L	*Construction contracts, documents, specifications and codes*	*4*	*4*
M	*Construction methods and materials*	*5*	*4*
N	*Construction surveying*	*4*	*3*
O	*Statics and strength of materials*	*4*	*4*
P	*Material quantity and cost estimates of projects*	*5*	*5*
Q	*Productivity software to solve technical problems*	*5*	
R	*Construction accounting and economics*	*4*	*4*
S	*utilizing modern instruments, methods and techniques*	*5*	*4*
T	*Construction law and ethics*	*4*	*5*
V	*Soils, and foundations*	*5*	*3*
W	*Scheduling and project management*	*4*	*5*
X	*Construction safety*	*5*	*5*
SKILL LEVEL: Skill level attained in program (maximum = 5) *SURVEY GROUP: Graduates who completed their degree program in construction management in 2006 and 2007.*			

The alumni survey shows satisfaction of the CMT alumni of their education after entering into the market. The alumni data did not reveal any particular weaknesses. In this set of surveys the skill level of 5 is the strongly agree response, so higher scores on the alumni survey are better. No clear action items are evident from this review.

Employer Survey

Table 9.8 is the summary alumni surveys in 2006 and 2007.

Table 9.8. Employers Survey (Spring 2008 & Spring 2009)

Employers were asked to evaluate employees hired from2006 &2007:			
GOAL	***GOAL DESCRIPTION***	***SKILL LEVEL***	
		2006	***2007***
A	*Demonstrate an appropriate mastery of the knowledge, techniques skills and modern tools of their disciplines*	*4*	5
B	*Apply current knowledge and adapt to emerging applications of mathematics, science, engineering, and technology*	*4*	4
C	*Conduct, analyze, and interpret experiments and apply experimental results to improve processes*	*3*	5
D	*Apply creativity in the design of systems, components, or processes appropriate to program objectives*	*3*	5
E	*Function effectively on teams.*	*4*	5
F	*Identify, analyze, and solve technical problems.*	*4*	5
G	*Communicate effectively.*	*4*	5

H	*Recognize the need for and possess the ability to pursue lifelong learning*	*3*	5
I	*Understand professional, ethical, and social responsibilities*	*3*	5
J	*Recognize contemporary professional, societal, and global issues and aware of and respect diversity*	*3*	5
K	*Have a commitment to quality, timeliness and continuous improvement.*	*5*	5
L	*Construction contracts, documents, specifications and codes*	*3*	4
M	*Construction methods and materials*	*3*	4
N	*Construction surveying*	*3*	3
O	*Statics and strength of materials*	*4*	4
P	*Material quantity and cost estimates of projects*	*3*	5
Q	*Productivity software to solve technical problems*	*4*	
R	*Construction accounting and economics*	*4*	4
S	*utilizing modern instruments, methods and techniques*	*3*	4
T	*Construction law and ethics*	*3*	5
V	*Soils, and foundations*		3
W	*Scheduling and project management*	*3*	5
X	*Construction safety*	*5*	5
SKILL LEVEL: Skill level attained in program (maximum = 5) *SURVEY GROUP: Graduates who completed their degree program in construction management in 2006 and 2007.*			

The employer survey indicates that CMT employers are satisfied with their alumni's education as they enter the job market. The emplyer data did not reveal any particular weaknesses. In this set of surveys the skill level of 5 is the strongly agree response, so higher scores on the employer survey are better. No clear action items are evident from this review. An improvement can be noticed between 2006 and 2007 as the program was gaining maturity.

Program Modification

The program was modified more than once as a result of the constituencies' feedback. The changes were as follow:

- In 2006, after hiring the program director, he reviewed the program and found that it lacks safety, building construction, and a construction equipment courses. The industry advisory board requested mechanical and electrical installation, and dispute resolution courses. The university approved reducing 5 units of the general education requirement from the college of engineering and computer science. Accordingly, two units were assigned to the construction equipment course (CMT 334/L), two units were assigned to the electrical and mechanical installation course (CMT 321), and a one unit was assigned to the dispute resolution course (CMT 449). There was a course for statics and a course for strength of materials. These two courses were combined in one course that is name statics and strength of materials (CMT 340) and the other course was assigned to be building construction (CMT 240).
- In 2007, based on the request of some employers to convert one of the two structural design course to a highway design and construction course. Students' feedback and faculty evaluation of the courses lead to changes on the prerequisites of some courses:

- Modify the prerequisites of CMT 309 from ACCT 220 to COMP 100 or consent of the instructor.
- Modify the prerequisites of CMT 312/L from ACCT 220 and BLAW 280 to MATH 255A, ACCT 220, and CMT 240/L or consent of the instructor.
- Change CMT 410/L to CMT 310/L and modify its prerequisites from ACCT 220 and BLAW 280 to MATH 255A, ACCT 220, and CMT 240/L and add a corequisite of CMT 312/L
- Change CMT 315/L to CMT 415/L and modify its prerequisites from CMT 210/L to CMT 312/L & CMT 310/L or consent of the instructor
- Change CMT 440B/L to CMT 441/L and modify its title from "Civil Technology II" to "Highway Design" and its prerequisites from CMT 440A/L to CMT 340
- Change CMT 440A/L to CMT 440/L and modify its title from "Civil Technology I" to "Structural Design"
- Modify the prerequisites of CMT 490 from none to CMT 312/L & CMT 310/L and change subject abbreviation number to CMT 494
- Modify the prerequisites of CMT 401/L from BLAW 280 and Senior Standing to BLAW 280 & CMT 210/L
- Modify the prerequisites of CMT 480 from BLAW 280 to BLAW 280 & CMT 210/L
- Modify the prerequisites of CMT 434/L from CMT 208/L, CMT 312/L, and CMT 326/L to CMT 208/L, and CMT 326/L
- Modify the prerequisites of CMT 488A from senior standing in construction management to senior standing in construction management, CMT 312/L & CMT 310/L

- In 2008, students' surveys and interviews showed the need for a course of construction drawing reading and the need for more construction equipment coverage. An addition course for construction drawings (CMT 110/L) and increasing the number of units of CMT 334/L were proposed
- In 2009, based on the request of the industry advisory board and the encouragement of the university, a course for green construction is proposed. It is in the process and is not approved yet.

Construction Management Program Assessment Summary (2009)

The assessment review of the construction management Technology program is presented in Table 9.9. Generally, the performance has improved and some consistency can be seen in the survey results and cross comparison of the data. No glaring problem areas are visible; however, several areas for investigation and improvement are noted in Table 9.9. These will be taken as action items to the CMT faculty to complete. If changes are warranted from their evaluation, they will be implemented based on their value added to the program

Table 9.9. Construction Management Assessment Summary

Goal	Performance Criteria	Results (What we learned)	Concerns	Action Items
A	*Demonstrate an appropriate mastery of the knowledge, techniques skills and modern tools of their disciplines*	• Performance measures showing satisfactory performance	• None	• None

B	*Apply current knowledge and adapt to emerging applications of mathematics, science, engineering, and technology*	Senior survey results	Ranked near top for importance in both employer and alumni surveys	• Perform oral and written communication review • Develop action plan from the review
C	*Conduct, analyze, and interpret experiments and apply experimental results to improve processes*	Performance measures showing satisfactory performance	None	None
D	*Apply creativity in the design of systems, components, or processes appropriate to program objectives*	• Senior survey results show marginal program performance • Alumni and Employer surveys show acceptable performance.	• None – student performance is good and can improve • Ranked near top for importance in both employer and alumni surveys	• Review courses in these areas with accreditation guide and examine review materials for standard exams.
E	*Function effectively on teams.*	• Senior survey results show improvement needed • ASC competition	• Students need to have a stronger construction management principles exposure	• Review courses in these areas with accreditation guide and examine review materials for standard exams.
Goal	**Performance Criteria**	**Results (What we learned)**	**Concerns**	**Action Items**
F	*Identify, analyze, and solve technical problems.*	Performance measures showing satisfactory performance	None	None
G	*Communicate effectively.*	Performance measures showing satisfactory performance	None	None
H	*Recognize the need for and possess the ability to pursue lifelong learning*	None	None	• Attend CMAA Seminars • Attend AGC Conference • Host guest speakers in different classes
I	*Understand professional, ethical, and social responsibilities*	• Senior survey results show improvement needed • Employer survey show an ok evaluation	Stronger ethics concepts	Ethics is covered in more classes
J	*Recognize contemporary professional, societal, and*	None	None	• Attend CMAA

	global issues and aware of and respect diversity			Seminars • Attend AGC Conference • Host guest speakers in different classes • Webinar in Dispute Resolution class
K	*Have a commitment to quality, timeliness and continuous improvement.*	None	None	None
L	*Construction contracts, documents, specifications and codes*	Students want a broader coverage of different contracts available		Cover 3 different contract types: CMAA, AGC, AIA
M	*Construction methods and materials*	None	Missing some topics such as prefabrication	Increase the class hours for CMT 334 to cover more items in details
N	*Construction surveying*	None	Certain topics are not covered in the surveying class	Book changes to cover more topics
O	*Statics and strength of materials*	Results were average	Students moderate analysis skills	Changing book, have an extra help session for students
Goal	**Performance Criteria**	**Results (What we learned)**	**Concerns**	**Action Items**
P	*Material quantity and cost estimates of projects*	None	Students needed a construction drawing class	A Construction drawings class (CMT 110) will be offered starting Spring 10
Q	*Productivity software to solve technical problems*	None	Students want to use Primavera & BIM	Primavera was add in addition to MS Project. Revits was added to CMT309
R	*Construction accounting and economics*	None	The need for more financial aspects	MSE 300 is being reformatted to cover all topics
S	*utilizing modern instruments, methods and techniques*	None	None	None
T	*Construction law and ethics*	None	None	None
V	*Soils, foundations, and Hydraulics*	None	None	None
W	*Scheduling and project management*	None	Covering just one Scheduling Software	Covering Primavera
X	*Construction safety*	None	None	None

II. STUDENT ACHIEVEMENT

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A. Graduates and Placement Data

1. Student employment numbers for each graduating class with starting salary information

Fig. 24 Number of Graduates

Year	2006-2007	2007-2008	2009-2009	2009-2010	2010-2011
Baccalaureate	6	7	7	22	14

*

2. Indicate the first career step of the graduates of the past year. Show the number of graduates in each category.

Fig. 25 Placement Data

Type of Employer	No. Graduates
Construction related employment	4
Construction or construction management firm	29
Material or equipment supplier	
Owner (utility, R.R., etc.)	
Design or development	
Continuing education	7
Non-construction employment	5
Seeking employment	6
No information	5
Total	56

3. The average annual salary for the above graduates is $57, 000.00 .

B. Students awards

Construction Management Competition First Place (Alternate Category) in the Annual Associated Schools of Construction Student Competition in Reno, NV in 2010

C. Student scholarships

1. A list of available scholarships the CMT students is posted on the department web site.
2. The CMT students were awarded the following scholarships
   a. The CMAA student scholarships in 2006 through 2011
   b. A number of university listed scholarships are awarded every year to CMT students

III. PROGRAM ADMISSION REQUIREMENTS

B. Institutional Requirements

1. State the curricular requirements established at the state level.

There are no specific curricular requirements established by the State of California. The Western Association of Schools and Colleges (WASC) serves as a coordinating body for the four-year colleges and universities within the state. The Board reviews and approves all requirements for granting degrees at the California State University System. However, the Board does not establish independent requirements. Rather, it serves to ensure efficient use of resources through consistent standards.

2. State the curricular requirements established at the institution level.

The University requires 120 credits for the baccalaureate degree. All students are required to take a minimum of 39 semester hours of credits from a list of courses especially designed to provide a broad-based General Education, intellectual breadth and balance.

The required pattern of General Education consists of 48 units distributed among these areas:

Basic Skills:	
Analytical Reading and Expository Writing……	3 units
Critical Thinking……..	3 units
Mathematics…….	3 units
Oral Communication……	3 units
Subject Explorations:	
Natural Sciences	8 units
Arts and Humanities	6 units
Social Sciences	6 units
Lifelong Learning	3 units
Comparative Cultural Studies/Gender, Race, Class and Ethnicity Studies, and Foreign Languages ...	6 units
U.S. History and Government (Title 5).....	6 units
Total Required General Education Units:.....	*47 units

*Note: The sum of the minimums for each section is 47 units. After completing the course requirements for all sections, if fewer than 48 units have been completed, then one additional GE course selected from any of the GE sections must be completed to meet the 48 unit requirement.

3. *State the curricular requirements established at the college level.*

There are no additional curricular requirements established by the College of Engineering and Computer Science other than the approval of all changes (to the curriculum) by the College's Academic Affairs Committee and the University's Educational Policies Committee (EPC).

A. Department Requirements

The Construction Management Technology Program at the California State University-Northridge admits freshmen students. Some students declare their major as Construction Management Technology at the beginning but they will not be officially admitted until they fulfill the requirements. The standards are the same for internal and external transfer students and include:

- 60 to 70 units of transferable courses.
- Completion of a minimum 1 year of lower-division math courses including college algebra, trigonometry and analytic geometry.
- A minimum grade of C in math and all transferred courses, or C- in the major must be attained in each course.
- Complete General Education Breadth Requirements in written and oral communication.
- Completion of at least one lower-division transferable course in each of the following areas: 1) physics with lab; 2) science elective with lab; 3) accounting, business law, or micro-economics. A minimum grade of C must be attained in each course.

For internal students, a change of major form should be signed by the department chair to be admitted to the program.

For transfer students, the admission process requires filing an application with the California State University-Northridge Admissions and Records Office. Internal transfers apply directly to the Department of Civil Engineering and Applied Mechanics.

Students declare a major at the time of admission or can be admitted as undecided. Students can then declare a major after being admitted. The Application forms for the University may be obtained at the Office of Admissions and Records. The University's deadline for receipt of applications from freshmen is November 1st and August 1st for transfer students. Prospective applicants are encouraged to contact the Admissions and Records Office for additional information on the University's deadlines, general admission information, etc.

The Department strongly encourages and urges ethnic minorities and women to apply for admission.

The Department is officially neutral on accepting transfer credits, since their acceptance or rejection is a University decision. In fact, the Department has experienced good results with transfer students and is therefore positively inclined toward accepting qualified transfer students. Transfer articulation for lower division prerequisites are handled by the University's Office of Admission and Records. Since the program is small, advising is performed by both full time faculty members; there is an agreed system of advisement between faculty members, therefore consistent application of course substitutions has not been a problem. The Department does not allow substitutions for required Upper Division courses, nor does it grant advance standing in Upper Division Courses except students that are transferring from a similar program and after thorough analysis by the advisor or students taking higher level equivalent course.