

Construction Management Technology
Division of Engineering Technology
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Degree Program(s) Assessed	Assessment Methods	Number of Individuals Assessed
Undergraduate Degree Program in Construction Management Technology	A. Exit surveys of graduates for F03 (8) & S04 (23) semesters	31
	B. Course evaluations for F03 semester; S04 data not available	294
	C. Employer reviews of student performance in internships, Sum 03	47
	D. AIC Graduate Placement Surveys for F03 (8) & S04 (19) semesters	27
	E. National CQE Level I for F03 (9) & S04 (24)	33
	F. ASC/AGC and NAHB Student Competitions, S03	24
	G. Alumni OUA Telephone Survey, S04 (1998 & 2002 grads) data not available	na

Analysis and Findings *(Note: Sample survey forms and accumulated data are available at the CMT Department Office; the results are summarized below)*

- A. The current graduates feel well prepared in most areas. In the F03 survey, 95% of the responses indicated a high (46%) or average (49%) level of skill acquired at OSU. In the S04 survey, 94% of the responses indicated a high (53%) or average (41%) level of skill acquired at OSU. Some graduates felt they acquired a low level of skill in areas of Financial Management, Computer Programming and Oral Communication and Stress Management.
- B. Course evaluations were excellent and generally paralleled the attitudes expressed by the current graduates, indicating overall satisfaction with the curriculum. Each professor reviews the evaluation forms, statistical results and individual comments and makes appropriate adjustments to the course content, format and delivery methods. We continually use the course evaluation process to improve the curriculum. Some of the more advanced students have noted a few areas of overlap between courses, which we are addressing with closer coordination among professors and other curricular modifications.
- C. Employers of our student interns are very pleased with their attitudes, work ethic and performance on the job. Many have developed a more formal approach to hiring such students and view these experiences as opportunities to train potential full-time employees and develop relationships that may lead to permanent employment. Forty-seven students held successful intern positions during the summer of 2003. This was the fourth year we asked the employers formally to evaluate the interns in various performance categories. Copies of these evaluations are on file in the Department. 90% of the interns were ranked in the top 25%, and 67% of them were ranked in the top 10% by their employers. 53% of the responses indicated performance levels above what the employer expects of an intern, and 44% indicated performance consistent with those expectations; only two interns performed below expected levels in a few areas.
- D. The American Institute of Constructors (AIC) Graduate Placement Survey is administered each semester to the graduating seniors in many construction programs across the country. We require each graduating student to participate in the survey, and the results are published in the October/November issue of the AIC Newsletter each year. We also administer a CMT

Placement Survey that supplements the AIC survey and provides additional information to [REDACTED], Director of CEAT Career Services.

All of the nine F03 graduates made commitments prior to or within one month of graduation. Average reported starting salary for the F03 graduates was \$41,200 with an average of 2.2 offers per student actively interviewing. Three of the graduates had accepted positions prior to beginning the fall semester. Five of these graduates had interned with their new employer.

All of the twenty-four S04 graduates had made commitments prior to or within one month of graduation. In the S04 semester, the average reported starting salary was \$40,600 with an average of 2.7 offers per student actively interviewing. Nine of the S03 graduates had accepted positions before the spring term began or shortly thereafter, and seven had interned with their new employer.

All graduates accepted positions consistent with the training provided by the CMT curriculum. Typical job titles were Field Engineer (8), Field Superintendent (3), Project Engineer (2), Assistant Project Manager (2) and Project Manager (1). Others noted were Carpentry Supervisor (1) and Sales/Marketing Representative (1).

- E. Of the nine graduates who sat for the CQE Level I in F03, two passed and seven failed. Of the twenty-five graduates who sat for the S04 exam, twelve passed and thirteen failed. In terms of the number of students passing the exam, OSU's results are only slightly lower than the national average for the S04 exam. However, it is interesting to note that for the S04 exam, OSU's average score is higher than the national average and higher than the average of the schools that require the exam. In some specific subject areas, our students score higher than the national average. Apparent areas of weakness are Communication Skills, Engineering Concepts, Management Concepts, Estimating, Cost Control, Safety and Project Layout. One of our graduates scored only four percent below the highest in the nation on the S04 exam. The CMT faculty feels that this examination is not yet an accurate assessment tool, as all students do not take it seriously. We expect that as the certification process evolves and the industry accepts certification as an important credential (similar to the Fundamentals of Engineering Examination), the student attitudes will change and the results will have more significance and be of more value to the department. This spring, we made an effort to review some of the examination subject areas in CMT 4293 (Capstone). The exam results were significantly improved over previous semesters, due in part to the fact that the students were more aware of the importance of performing well on the exam.

An exit survey was administered to determine the graduates' opinions about overall preparedness for entry-level industry positions and areas in which they felt most and least prepared. Of the 30 graduates surveyed for the F03 and S04 exams, all felt that their coursework at OSU prepared them for the exam, and 28 thought the exam was a fair measure of what an entry-level Constructor should know. 23 anticipated passing the test (if the cut score were 75%), and 20 would have taken the exam if it had been optional.

Areas in which the students felt MOST prepared included surveying, estimating, scheduling, management, safety and print reading. Areas in which they felt LEAST prepared included scheduling, cost control, surveying and financial topics. Some students expressed that they were well prepared in all areas. The fact that some of the same subject areas appear in both lists indicates that the student's perceptions of their preparedness is a very personal thing, and no broad conclusions can be reached about the program. The faculty is aware of these perceptions and attempts to respond to them in an appropriate manner.

- F. Three CMT teams of six students each participated in the Associated Schools of Construction (ASC) Region V Student Competitions held in Dallas, TX. The OSU Design Build Team Placed 1st (of five) and the Commercial Building Team placed 1st (of seven). The Heavy-Civil Team placed 4th (of six). Outstanding individual presenters were also recognized, and [REDACTED] placed 1st, [REDACTED] placed 2nd, and [REDACTED] placed 3rd in CB. From the DB team, [REDACTED] placed 1st and [REDACTED] placed 2nd. *This was the first time in the ten-year history of these competitions that the same team (OSU Commercial Building Team) won the team competition and all the individual presenter awards.*

Six OSU students also competed in the national student competition sponsored by the National Association of Home Builders (NAHB). This team placed 10th in a field of 29 teams, a remarkable accomplishment for OSU's second time to participate in this competition. The team was also responsible for securing its own funding to cover competition expenses, not a small undertaking in itself; the NAHB national competition is held annually in conjunction with the NAHB National Convention in Las Vegas.

- G. In spring 2004, the Office of University Assessment CMT administered an Alumni Survey via telephone to the 1998 and 2002 graduates. Program-specific questions were submitted to OUA in fall, 2003 for inclusion in that survey. The survey results are not yet available but will be included in the 2005 Assessment Report.

Use of Assessment Results

Several new courses have been developed as a result of our assessment efforts. Due to the importance of this subject area expressed by our alumni, Advisory Committee and industry recruiters, we have begun teaching a course in Construction Safety. We began by teaching the OSHA 10-hour course in Fall 1993 and the OSHA 30-hour course in each spring semester since 1994. The course has become a popular Controlled Elective for students earning degrees in Fire Protection and Safety Technology. Because of the increased demand for the course (from FPST students and increased numbers of CMT students), we began offering it both semesters, beginning with Fall 2000. The OSHA 30-hour course is one of the major components of CMT 4443 - Safety & Loss Control, which is now a mandatory course in the CMT curriculum.

Students who complete this course are certified by OSHA. This course was recognized as one of major importance by the CMT reviewer during our last TAC of ABET accreditation review.

Based on input from alumni and current students, the Mechanical and Electrical Systems courses have been combined. We taught the course in this format for the first time in Spring 1997. We have also changed the structure of this course to include a laboratory section that will give the students more hands-on experience. We have solicited assistance with course development from members of the Construction Management Advisory Board (CMAB). This group has helped us define appropriate course content to prepare our students better for this segment of the industry, as well as find a highly qualified adjunct instructor, who taught the course for the first time in Spring 2001. He has taught the course each Spring semester since with modifications suggested by the CMAB and other industry leaders.

The new surveying course (CIVE 3614) was taught for the first time in Fall 1995. Feedback from our constituents indicates that more topics dealing with building construction layout should be included in the course. As a result, we offered a course in Fall 2000 that contained an Advanced Surveying Module along with some other pertinent topics, including Equipment Management and Scheduling Basics. This course has been phased out, and selected topics are now included in newly developed courses. The field layout component is now a part of CMT 3433 – Site Development. Construction Scheduling is now being taught in CMT 3273. All these topics have been recommended by the CMAB, employers of our graduates, and new alumni.

Concerning surveying, we have initiated dialog with the vice-president of Manhattan Construction Co., one of the major companies recruiting our interns and our graduates. He has expressed willingness to help us determine what skills are important and if our graduates have any weaknesses in this area. A Project Manager from Cantera Concrete Co., a subsidiary of Manhattan, as well as an alumnus of the CMT program and an active member of the IAC, also arranged for the company to donate several surveying instruments to the department for use in developing this instruction. Additionally, the faculty member responsible for the surveying module has completed a correspondence course in the subject from the Kiewit Company, one of many companies that regularly recruits and employs our graduates.

We continue to provide opportunities for students to develop their oral, written and graphic skills, as these are perceived as essential by the industry but are often not given enough emphasis. The Drawing Interpretation course (CMT 2253) has been restructured to include major emphasis on AutoCAD, and is now called "Construction Drawings & CAD." Students enrolled in the Second Internship course (CMT 3332) are required to give oral presentations of their written reports to the students in the Introduction to Construction course (CMT 1214). This will give the advanced students another opportunity to develop presentation skills and will also give the younger students a glimpse of what lies ahead in the curriculum. We have also begun requiring two internships, again responding to suggestions from our constituents.

We continue developing a Capstone experience that will eventually contain elements of advanced Computer Estimating, Scheduling and Project Management. We teach this course as CMT 4293 - Construction Manager Concepts, and the course addresses several of the deficiencies noted in the surveys and in the Certification Exam. This course will also include review of selected topics covered by the exam.

We have added ACCT 2103 - Principles of Accounting as an approved Business Elective for students on curriculum plans dated Fall 2000 or before. Alumni and CMAB members have recommended developing this skill, and Certification Exam results indicate some weakness in this area. This course is now required for all students entering the program on curriculum sheets dated Spring 2001 or later.

The Computer Estimating course (CMT 4273) has undergone several revisions due to assessment input. Upon the advice of the CMAB, alumni and current students, we now emphasize Excel spreadsheets and two software packages (Timberline and MC²) that have achieved broad acceptance by the construction industry. Also under consideration is the development of a computer estimating course specifically for Heavy Option students featuring emphasis on HCSS software, which is specially suited for Heavy and Civil construction projects.

Several Course Actions mentioned in the June 2000 Report as "under consideration" became effective with the Fall 2001 Degree Requirement Sheets and directly address program needs perceived by our faculty and our various constituents. Approved Course Actions include:

- ACCT 2103 is now a required course.
- CMT added an "in-house" construction scheduling course, CMT 3273, in Fall 03.
- Many prerequisites have been modified to insure that students have adequate preparation for the advanced courses.
- Several courses will be modified to avoid duplication of content with other courses and to include topics felt to be lacking in the current courses.
- Structural design courses (Timber, Formwork, Steel, Concrete) will be combined and modified to include construction emphasis. The plan also includes a review of structural analysis techniques applicable to the material covered in the courses. Structures I (Analysis, Timber & Formwork Design) will be offered for the first time in Fall 2004, and Structures II (Steel & Concrete Design) will be offered for the first time in Spring 2005.
- Two internships are now required – CMT 3331 and CMT 3332.
- CMT 3734- Soils in Construction Technology was offered for the second (and final) time in Spring 2003; this course addressed geotechnical issues of importance to construction professionals, and a member of the CMT faculty was responsible for this course in Spring 2003. These topics were included in CMT 3433, taught for the first time in Spring 2004 (see below).
- CMT 3433 – Site Development has been added to emphasize geotechnical issues, practices and procedures of site work, and advanced building layout techniques. This course was developed to alleviate some of the duplication noted in previous assessment efforts, and to introduce some environmental topics that have recently become important to the construction industry.