

School of Engineering

2010 Assessment Findings and Curricular Improvements Master's and PhD Programs

OVERVIEW

Each of engineering's graduate programs (i.e., biomedical, civil, engineering management, electrical and computer science, and mechanical) conducts reviews of its programs annually. In Fall 2009, a new engineering master's degree program in material science and engineering (MSE) has been formally approved.

The School of Engineering has adopted a unified assessment process using common assessment processes, tools, and analysis methods all engineering programs for evaluating student learning outcomes.

ASSESSMENT MEASURES

The School of Engineering uses the following measures to assess student learning outcomes:

- Review of coursework by major professors, including: exams, homework assignments, course projects (as appropriate), and reports (as appropriate)
- Review of course content by department chairs, including topics covered and tools/techniques taught
- Student course evaluations
- Comprehensive Exam (for doctoral students)
- Evaluation of theses (if applicable) by major professors and readers using criteria: originality of work, quality of experimental design, accuracy of data analysis, quality of written report, and oral presentation (see rubric for graduate theses)

ASSESSMENT FINDINGS

Historical Analysis and Methodology Discussion:

For AY 2009-10, the School of Engineering analyzed course grades, student evaluation, and enrollment data in core curriculum courses (i.e., ENGR 516, ENGR 520, and CMGT 505) and compared this data to the four-year moving average period between AY 2004-05 through AY 2008-09. These are gateway courses for all engineering graduate students at the master's level and are required of all Ph.D. students who have not completed a similar course during their master's work. The data is summarized in Table 1 below.

Course enrollment in all 3 core engineering courses has stabilized in AY 2009-10 at roughly 25-30 students compared to the 50+% growth in enrollment seen in previous years.

	Historical Data-2004-2009			AY 2009-10		
	ENGR 516	ENGR 520	CMGT 505	ENGR 516	ENGR 520	CMGT 505
Instructor (10=high; 1=low)	7.98±0.27	7.23±0.45	9.7	-	8.2	8.6
Course (10=high; 1=low)	7.25±0.36	6.85±0.23	8.7	-	7.6	8.9
Objectives Achieved (5=high; 1=low)	4.03±0.05	4.05±0.13	4.7	-	4.2	4.8
Learned A Lot (5=high; 1=low)	3.95±0.29	3.85±0.17	4.7	-	4.1	4.6
Enrollment (high/low)	21.5±2.4 (25/13)	16.75±4.85 (30/9)	33	-	27	18

Table 1: Summary of historical course evaluation data vs. AY 2009-10 for core engineering courses.

For Spring 2010, ENGR 516, while offered, did not have student evaluations completed for this cycle. The School will work with the instructor to ensure these evaluations are completed annually. Since the same instructor (Dr. Moses) has been teaching the course for the previous 5 years, we can confirm there were no major instructional changes with this course. For ENGR 520, the dip in course evaluations seen in AY 2008-09 has been resolved and in AY 2009-10 was at the highest levels in 5 years. Dr. Weiss was a new instructor in AY 2008-09 and has adjusted the pace and course content based upon meetings with the Graduate Committee Chair and feedback from students. It should be noted that prior to 2008 CMGT 505, an off-campus course, was evaluated via surveys by the program director which was different than that employed by on-campus courses. Starting in AY 2008-09, CMGT 505 began to be evaluated similar to other courses at CUA, hence there is only one historical data point (AY 2009) against which comparisons can be made. The evaluations for CMGT 505 remain high in all areas.

PhD Comprehensive Exams and Progression:

For AY 2009-10, 3 students (100%) successfully defended and were awarded with doctoral degrees. Additionally, 75% (six out of eight) of students taking the doctoral comprehensive exams passed. All students are still continuing in their respective programs. These rates are consistent with historical data for the School of Engineering. The passing rates for the PhD Comprehensive Exams support the quality and rigor of the preparation of our students and confirm that students are achieving the expected program learning outcomes.

CURRICULAR IMPROVEMENTS FOR MASTER'S PROGRAM AND PH.D. PROGRAMS

In Engineering, the key core courses for all graduate students are ENGR 516, ENGR 520, and CMGT 505, which function as the gateway courses in the School. Both student and faculty performance are continuously reviewed and no changes have been made to these core courses in the recent past because of our belief that they are functioning properly to prepare students for the remainder of their work. As a result of the AY 2009-10 graduate assessment report, the Engineering Graduate Committee has recommended and will implement both Fall and Spring offerings of ENGR 516 and ENGR 520 starting in Fall 2010. This curricular change addresses the dramatic rise in enrollment in these gateway courses (resulting from a surge in graduate enrollment) seen in recent years. It will also improve the instruction and interaction between students and faculty, and also allow more flexibility for students wishing to graduate in a timely manner.

For AY 2010-11, the only change currently planned for the doctoral programs in engineering is the streamlined offerings of directed study, independent study, special topics, and theses/dissertation guidance courses, all of which will be handled by the Office of the Dean rather than at the departmental level as in previous years. This planned change will enhance the coordination, approval, and assessment of student progress in these courses.