

SCHOOL OF ENGINEERING

Report of Assessment Findings & Curricular Improvements Academic Year 2010-11

Graduate (Master's and PhD) Programs

OVERVIEW

Each of engineering's graduate programs (i.e., biomedical, civil, engineering management, electrical and computer science, materials science & engineering, and mechanical) conducts reviews of its programs annually.

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 2010-11, as part of our normal assessment process, 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 five-year average period between AY 2004-05 through AY 2009-10. 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.

For AY 2010-11, engineering has offered ENGR 516 and ENGR 520 in both the Fall and Spring semesters based upon the recommendation of the Engineering Graduate Assessment Report for AY 2009-10 which concluded that enrollment in these courses were excessively large. The resulting effect was to dramatically decrease enrollment in each course from 25 to ~10 students/semester for ENGR 516 and from 28 to 17 students/semester for ENGR 520. Instructor and course evaluations as well as “achievement of course objectives” and “learned a lot” quantitative scores for these courses have shown significant improvements for AY 2010-11 compared to historical averages.

In Fall 2010, CMGT 505 was offered through engineering’s off-campus program in engineering management. Unfortunately, due to a communication error with a first time instructor, this course was not evaluated in Fall 2010. Historically, this course has received the highest evaluation scores in the School and is not an immediate area of concern.

	Historical Data-2004-2010			AY 2010-11		
	ENGR 516	ENGR 520	CMGT 505	ENGR 516	ENGR 520	CMGT 505
Instructor (10=high; 1=low)	7.64±0.39	7.3±0.35	9.15±0.35	7.9±0.1	8.8	8.6
Course (10=high; 1=low)	7.06±0.34	6.93±0.20	8.8±0.06	8.0±0.7	8.6	8.9
Objectives Achieved (5=high; 1=low)	4.22±0.20	3.95±0.16	4.75±0.03	4.15±0.15	4.5	4.8
Learned A Lot (5=high; 1=low)	4.10±0.19	3.8±0.15	4.65±0.03	4.3	4.4	4.6
Enrollment (high/low)	19.8±2.5 (26/13)	17.0±3.93 (30/9)	33 (33/18)	6	17	23

Table 1: Summary of historical course evaluation data vs. AY 2010-11 for core engineering courses.

PhD Comprehensive Exams and Progression:

For AY 2010-11, 6 students (100% pass rate) successfully defended their doctoral research and were awarded with doctoral degrees. Additionally, 100% (n=5) 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.

For AY 2010-11, ENGR 516 and ENGR 520 were offered in both Fall and Spring semesters as previously recommended. This change has been shown to improve the instruction and interaction between students and faculty and has been well received by the students. The faculty teaching this course has also expressed that this change has increased the instructional effectiveness of the course. Surprisingly, enrollment in ENGR 516 has decreased for AY 2010-11 as compared to the prior 2 years. We will continue to monitor enrollment in ENGR 516 to assess whether both Fall and Spring offerings may still be needed.

For AY 2010-11, the School of Engineering consolidated the offerings of directed study, independent study, special topics, and theses/dissertation guidance courses to the School-level (previously, these courses were offered at the department/program level). While this should not change the instruction, the School-level administration of these courses ensured the coordination, approval, and assessment of these courses over the past year.

Lastly, the new master's degree in materials science & engineering introduced in AY 2009-10 is still in the process of ramping up with only 2 FTE students and only 1-2 offerings per semester. There is insufficient enrollment to currently assess the program at this time.