

Five Year Review Document for the Undergraduate Engineering Program

2/ 16/2011

Five year Plan:

(a) Changes during the past five years

Since our last ABET visit in 2003 we have developed a systematic process of assessment-evaluation-improvement-assessment. This process has resulted in several improvements to the curriculum and other program attributes. The reengineering of the curriculum has increased the level of achievement of program outcomes and has also resulted in better alignment of the curriculum with the shifting career opportunities in industrial engineering. The Table below shows a summary of changes, assessment tools indicating the need for the changes and the improvement resulted from the change.

Table: Program Improvements since 2004

Change	Date Approved	Date Implemented	Assessment data indicating the need	Improvements resulted	Comment
ENGR 4180, Product Process Development, description change	April 2004	Fall 2005	Alumni survey and IAB meeting	Exposure to managing the process of product development, contributing to outcome (c)	This course is a technical elective for the IE program and a required course for graduate program
ENGR 4080 Manufacturing Systems, Discontinued Replaced with ENGR 4400	May 2005	Winter 2006	IAB comments on shifting careers to service sector	Streamlined numbering,	A course number change
ENGR 3101 Statics and Dynamics, new course, not cross listed with physics	February 2006	Fall 2006	Faculty assessment and student comments	Students are exposed to more practical problem solving and application	This is now taught by engineering faculty
ENGR 4610, Senior Project I,	March 2006	Fall 2007	Faculty self assessment of	The prerequisites	

prerequisite			courses	were strengthened to assure that students have the knowledge needed to complete their project	
ENGR 1011, Engineering an introduction, new course to replace ENGR 1010	April 2007	Winter 2008	Curriculum Committee and IAB discussions on how to change the course to include, ethics, contemporary issues, outcomes (f) and (j)	Students are exposed to engineering software, engineering ethics, and contemporary issues. Also the credit hour is increased	We are monitoring the data as become available.
ENGR 4400, Systems Modeling, title, description, course credit restriction, prerequisites changed	June 2007	Fall 2008	IAB discussions, Alumni feedback, monitoring career paths in IE	The emphasis of the course is changed from manufacturing to more broad areas of system modeling, AI techniques, supply chain	This change will strengthen the achievement of outcome (k), using modern engineering tools
ENGR 4440, Manufacturing Systems Engineering, title, description, prerequisites changed	June 2007	Fall 2008	IAB discussion, Alumni input. The material traditionally covered in 4400 is transferred here with more emphasis on manufacturing systems rather than automation	Students are exposed to manufacturing systems topics for 50% of the course and the other 50% is automation. The change makes the course more in line with IE career opportunities	Data is being monitored
ENGR 2060 Material Science, prerequisites changed	December 2007	Fall 2009	Required change of prerequisite to match the new Chem. course required in the program	It brings the course in-line with the new curriculum course requirement	
ENGR 2070 prerequisites changed	December 2007	Fall 2009		To bring the course in-line with new intro to engineering course	
ENGR 4603	July 2008	Fall 2010	Graduating	Removing the	The assessment

discontinued			Senior Survey indicating low value for the course	course help the department to add credit to manufacturing processes as requested by students and faculty self evaluation	data will be monitored to track improvements
ENGR 2070 units changed from 2 to 4	July 2008	Fall 2010	Faculty self evaluation, and student comments	Semi conductor manufacturing techniques have been added to the course material and more extensive lab activity	The assessment data will be monitored for tracking improvement
ENGR 3841 title change	July 2008	Fall 2010	Needed as a result of removing OR II		

(b) Curriculum and student learning

Assessment Process (including measures and tools used):

The following assessment tools are used for the evaluation of outcomes achievement:

1. Prerequisite exams, some key courses (each quarter)
2. Course portfolio, all engineering courses (each quarter)
3. Faculty self assessment of courses (each quarter)
4. Senior Exit Surveys of graduating seniors (every year)
5. Senior project evaluation by faculty/sponsors/IAB (every year)
6. Co-op evaluation by advisor and the employer (as available)
7. Mock external accreditation review (every six years)

Table B.3.4.1 shows the mapping of assessment tools and measured outcomes.

Mapping of Program Outcomes and Assessment Tools

Assessment Tool	Program Outcome										
	1. Math/Sc/Engr Knowledge	2. Design/Experiment	3. System Design	4. Teaming	5. Problem Solving	6. Professionalism/Ethics	7. Communication	8. Global/Societal Context	9. Life-Long Learning	10. Contemporary Issues	11. Engineering Practice
Prerequisite Exams	√										
Course Portfolios	√	√	√	√	√	√	√	√		√	√
Faculty Self Assessment of Courses	√	√	√	√	√	√	√	√	√	√	√
Senior Exit Survey	√	√			√	√	√				
Senior Project Evaluation by Faculty, Industry Sponsors, and IAB		√	√	√	√	√	√	√	√	√	
Co-op Evaluation by Employer and advisor	√		√	√	√	√	√		√		
Mock external Program Evaluation	√	√	√	√	√	√	√	√	√	√	√

Since 2003 the number of students in the program has doubled to 180. We expect with the addition of Computer Engineering and Construction Management this number will increase in the future.

(c) Resources

Faculty

At the undergraduate level we are offering 3 programs, Industrial Engineering, Computer Engineering and Construction Management. We currently have 5 faculty members including the Chair, plus one who has joint appointment with Computer Science. The Construction Management and Computer Engineering programs each have only one faculty member assigned to them. To make these programs viable we are expecting to

add two faculty members, one in Computer Engineering and one in Construction Management. We also need one more faculty in Industrial Engineering to cover all the courses in the undergraduate and graduate programs.

Equipment

We need to upgrade our computer labs to be able to effectively run the engineering software. The computers in all the Engineering Laboratories need replacement. We will also need resources to upgrade our yearly contractual obligations regarding our software contracts. We have requested money for adding a Construction Management Laboratory and adding additional equipment to our other Laboratories.

Graduate Program

We did not conduct an outside review for MS in Engineering Management Program. The program includes courses that are tiered with our undergraduate program in I.E. and also electives are taken from the College of Business and Economics. Both these programs have external accreditations. The assessment processes in our undergraduate and graduate programs are the same and the same faculties teach the courses in undergraduate and graduate programs. Only three exclusively graduate level engineering courses are offered, which are taught by the Engineering faculty.