

MECHANICAL ENGINEERING PROGRAM ASSESSMENT PLAN

Program Educational Objectives

1. To produce competent engineers employed in a wide variety of technical areas in the local, national or international engineering job markets.
2. To prepare some of our graduates for immediate further education with a view toward careers in research, education or business.
3. To prepare some of our graduates for careers in government service, either civilian or military.
4. To educate engineers who can set their engineering work in a larger social-political context, and who realize the value of continuing education.

Student Outcomes

The Mechanical Engineering Program assesses 11 Student Outcomes

- (a) an ability to apply knowledge of mathematics, science, and engineering
- (b) an ability to design and conduct experiments, as well as to analyze and interpret data
- (c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- (d) an ability to function on multidisciplinary teams
- (e) an ability to identify, formulate, and solve engineering problems
- (f) an understanding of professional and ethical responsibility
- (g) an ability to communicate effectively
- (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- (i) a recognition of the need for, and an ability to engage in life-long learning
- (j) a knowledge of contemporary issues
- (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Relationship of Student Outcomes to Program Educational Objectives

Program Educational Objectives

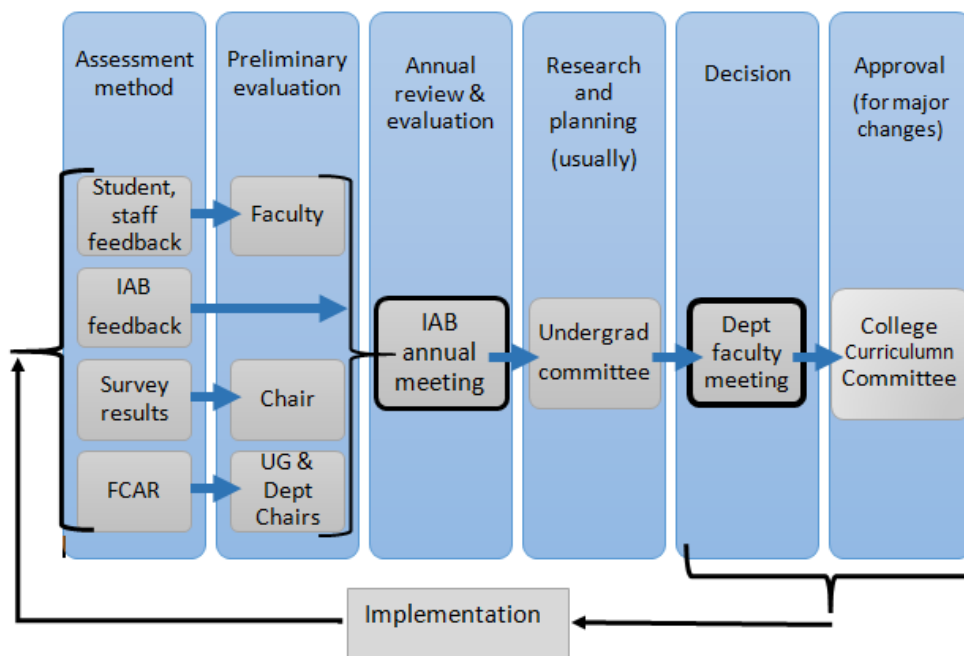
Student Outcomes	1. To produce competent engineers employed in a wide variety of technical areas in the local, national or international	2. To prepare some of our graduates for immediate further education with a view toward careers in research, education or	3. To prepare some of our graduates for careers in government service, either civilian or military.	4. To educate engineers who can set their engineering work in a larger social-political context, and who realize the value of
(a) an ability to apply knowledge of mathematics, science, and engineering	X	X	X	X
(b) an ability to design and conduct experiments, as well as to analyze and interpret data	X			
(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability	X		X	X
(d) an ability to function on multidisciplinary teams			X	
(e) an ability to identify, formulate, and solve engineering problems	X			
(f) an understanding of professional and ethical responsibility	X		X	X
(g) an ability to communicate effectively	X	X	X	
(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context	X	X	X	X
(i) a recognition of the need for, and an ability to engage in life-long learning		X		X
(j) a knowledge of contemporary issues	X	X	X	X
(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	X			

Process

The mechanical engineering faculty holds primary responsibility for assessment and evaluation, with the Chair responsible for ensuring implementation and documentation. Assessment, evaluation, and implementation are documented primarily in the form of the minutes of faculty meetings, including minutes of the annual meeting with the Industrial Advisory Board.

The Department of Mechanical Engineering currently uses four primary assessment methods to evaluate its success in achieving student objectives and to help identify opportunities for improvement.

- 1) Student and staff feedback.
- 2) Feedback from the department's Industrial Advisory Board (IAB).
- 3) Survey results (graduating seniors and alumni).
- 4) Faculty Course Activity Reports (FCAR), described below.



Faculty Course Assessment Reports

Achievement of each student outcome is assessed on an annual basis in three or more courses. The table below shows which outcomes are assessed in each course. The specific metrics used vary from course to course and outcome to outcome, but include scores on specific problems/homework/assignments (direct), faculty assessment of capstone and other project reports (direct), and survey results (indirect).

Distribution of outcome assessments over required ME courses.

Course	Student Outcome										
	a	b	c	d	e	f	g	h	i	j	k
ME 110	X										X
ME 120	X				X	X					
ME 121	X				X	X					
ME 123	X				X						X
ME 204			X	X				X		X	X
ME 205			X				X	X		X	X
ME 213	X		X		X				X		
ME 223	X							X	X		
ME 225	X				X	X					
ME 226		X		X		X					
ME 241		X	X	X			X		X		
ME 242		X	X	X			X		X		
ME 251						X				X	X
ME 280		X		X		X		X			

Beginning with the 2013/2014 academic year, the department adopted a new, systematic process for faculty to report their assessments and for the individual course assessments to be collected and evaluated at a program level. The process is based on the preparation of Faculty Course Assessment Reports (FCAR). The original inspiration was provided by a paper by John Estell (Int. J. Engng Ed. Vol. 25, No. 5, pp. 941-951, 2009), although we have freely modified and adapted the concept to fit our program's needs. As part of the course file for each required course, the faculty member in charge is responsible for producing an FCAR, which summarizes important changes made to the course, the assessment process and results, and suggestions in a standard format.