CAL MARITIME

ANNUAL PROGRAM REPORT

Academic Program	Mechanical Engineering
Reporting for Academic Year	2016-2017
Department Chair	Nader Bagheri
Date Submitted	2/12/2018

1. SELF-STUDY (about 1 page)

A. Five-year Review Planning Goals

Present your Planning Goals from your last 5-Year Plan, indicating changes and updates from last year's report.

The last comprehensive Program Review was the ABET Self-Study report which was prepared in July of 2013. The next comprehensive Program Review will be the ABET Self-Study report which will be prepared by July 1st of 2019. There are annual student outcome assessment reports which are prepared to measure achievement of student outcomes. ME program Student Outcomes, Assessment Process, and Assessment results are described in section 2 of this report.

B. Five-year Review Planning Goals Progress

Report on progress toward achievement of your 5-Year Plan.

The ME department is on its 4th year of program review during this 2016-17 review period. The data that have been collected to date and assessed show no anomalies.

C. Program Changes and Needs

Report on changes and emerging needs with relation to a) curriculum and b) resources (including faculty, staff, space, equipment).

a) The following courses were reduced from 4 units to 3 units to reduce the overall number of program units: ENG 300 (Engineering Numerical Modeling & Analysis, ME 432 (Machinery Design), and ME 444 (Energy Systems Design)
b) No change in faculty, staff, space, and equipment

2. **SUMMARY OF ASSESSMENT** (about 1 page)

A. Program Student Learning Outcomes

The Mechanical Engineering Department has 16 learning outcomes that are defined by the accrediting body, ABET. The table below shows the mapping between those outcomes and the ILOs.

	Institution-wide Learning Outcomes →	A. Communication	B. Critical and Creative Thinking	C. Quantitative Thinking	D. Scientific Reasoning	E. Lifelong Learning	F. Discipline-specific Knowledge	G. Information Fluency	H. Leadership and Teamwork	I. Ethical Awareness	J. Global Learning
ABET Based Mechanical Engineering Dept. Outcomes ↓											
1	an ability to apply knowledge of mathematics, science, and engineering			■	■		■				
2	an ability to design and conduct experiments, as well as to analyze and interpret data		■	■	■		■				
3	an ability to design a system, component, or process to meet desired needs within realistic constraints such as economics, environmental, social, political, ethical, health and safety, manufacturability, and sustainability									■	■
4	an ability to function on multi-disciplinary teams	■							■		
5	an ability to identify, formulate, and solve engineering problems			■	■		■				
6	an understanding of professional and ethical responsibility									■	
7	an ability to communicate effectively	■									
8	the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context									■	■
9	a recognition of the need for, and an ability to engage in life-long learning					■					
10	a knowledge of contemporary issues					■					
11	an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice						■				
12	an ability to apply principle of engineering, basic science, and mathematics (including multivariate calculus and differential equations) to model, analyze, design, and realize physical systems, components or processes			■	■		■				
13	ability to work professionally in both thermal and mechanical systems areas						■				
14	an ability to apply the "hands-on" knowledge to solve/understand engineering design problems/systems						■				
15	an ability to demonstrate leadership roles								■		
16	an ability to comprehend and convey technical information	■									

B. Program Student Learning Outcome(s) Assessed

The majority of courses taught by the Mechanical Engineering faculty in the 2016-17 Academic Year carried out assessments of student learning outcomes. The course outcomes are mapped onto the 16 department outcomes. Assessment of the course outcomes for each class is used in the assessment of the department's performance in each of the 16 department outcomes.

C. Summary of Assessment Process

Within each Mechanical Engineering course, two forms of assessment data are collected. The more quantitative and analytical of the two is the use of course materials to assess student

performance in meeting the course outcomes. For each course outcome, the instructor must identify an assignment, project, quiz problem, or exam question that scores the students between 1-5, where 5 demonstrates exemplary performance and 3 demonstrates competence. The instructor then aggregates the score and compile results for the course. A second assessment is the use of student surveys, which ask the students to self-assess how strongly they feel they have met the course objectives. The students are asked to use a 1-5 scale, where the meanings of the values are similar to the earlier assessment. The measures from both methods for each course outcomes. Since each course outcome is mapped to a department outcome, the instructor then aggregates scores for each of the department outcomes assessed by the course outcomes. These results are placed into a central spreadsheet for the department. For a course to meet the meet the goals laid out by the department, the results from each of these methods should yield and average score of 3.5 or have 70% of the population score 3 or better. Courses that do not meet the requirements are identified for further review.

D. Summary of Assessment Results

Currently, there are no major anomalies from the assessment data collected. The data set from the Instructor Class Assessment is shown on the next page. It demonstrates which courses are assessing which Department Outcomes based on the Course Outcomes. No corrective actions are being proposed with regard to course operations.

However, because of the level of effort required for full assessment of all courses, even on a bi-annual basis, the department is studying methods of streamlining the process. This should include the automation of the collection of student self-assessment data and more selectively choosing courses that will cover all of the department's outcomes.

Instructor Class Assessment (ICA) Quantitative Measures 2016-2017

Red flags: 0
Average below 3
Passing below 70%

Note: 4 cases where average was acceptable but % slightly below 70%. Considered ok since 1 crieterion met and other was not dramatically below.

					PO1		PO2		PO3		PO4		PO5		PO6		PO7		PO8		PO9		PO10		PO11		PO12		PO13		PO14		PO15		PO16	
Course	Year	Semester	Instructor	Stem	Ave	Percent ≥ 3	Ave	Percent ≥ 3	Ave	Percent ≥ 3	Ave	Percent ≥ 3	Ave	Percent ≥ 3	Ave	Percent ≥ 3	Ave	Percent ≥ 3	Ave	Percent ≥ 3	Ave	Percent ≥ 3	Ave	Percent ≥ 3	Ave	Percent ≥ 3	Ave	Percent ≥ 3	Ave	Percent ≥ 3	Ave	Percent ≥ 3	Ave	Percent ≥ 3
ME 240	2	Spring	Tsai	Energy	3.507	73%							3.602	76%																				
ME 340	3	Fall	Bagheri	Energy	3.92	86%							3.92	86%																				
ME 344	3	Spring	Tsai	Energy	3.724	77%							3.724	77%													3.83	83%						
ME 440	3	Spring	Bagheri	Energy	4.32	95%			4.83	100%			4.32	95%															4.42	96%				
ME 349	4	Fall	Tsai	Energy	3.82	76%	3.54	72%	3.41	67%	3.38	78%	3.6	73%			3.38	100%							3.54	72%	3.82	84%	3.41	67%			3.38	78%
ME 394	4	Fall	Bagheri	Energy	4.11	87%			4.19	91%			4.11	87%			4.31	97%			4.31	97%			4.22	93%	4.11	87%	4.11	87%				
ME 442	4	Fall	Pronchick	Energy	3.6	81%			3.6	81%			3.6	81%	3.4	75%	3.6	67%			3.2	67%			3.4	76%	3.6	81%	3.6	81%			3.4	71%
ME 444	4	Spring	Bagheri	Energy	4.54	88%			4.39	94%			4.54	88%			4.53	100%			4.53	100%							4.54	88%				
ME 230	2	Fall	Pronchick	Mech.	3.9	84%			4.1	97%			3.9	88%											4.1	98%	4	91%	4.3	100%			3.80	93%		
ME 232	2	Fall	Snell	Mech.	3.91	82%							3.91	82%													3.78	80%						
ME 330	2	Spring	Hadian	Mech.																														
ME 332	2	Spring	Hadian	Mech.																														
ME 339	3	Spring	Nordenhol	Mech.																														
ME 392	3	Spring	Jorge	Mech.																														
ME 436	3	Spring	Holden	Mech.																														
ME 430	4	Fall	Nordenhol	Mech.																														
ME 432	4	Spring	Jorge	Mech.																														
ENG 250	2	Spring	Snell	Inst/Ctr																														
ENG 250 L	2	Spring	Holden	Inst/Ctr																														
ME 350	3	Fall	Snell	Inst/Ctr																														
ME 350L	3	Fall	Snell	Inst/Ctr																														
ME 360	3	Fall	Holden	Inst/Ctr																														
ME 360L	3	Fall	Holden	Inst/Ctr																														
ME 460	3	Spring	Snell	Inst/Ctr																														
ME 460L	3	Spring	Snell	Inst/Ctr																														
ENG 110	1	Fall	Pronchick	Design											4.3	99%			4.4	100%	4.3	99%	4.4	100%									4.1	100%
ENG 210	1	Fall	Tsai	Design	3.91	84%							3.91	84%							4.64	100%			3.89	84%	4.67	100%						
ME 220	2	Fall	Oppenhein	Design																						96%								
ENG 300	3	Fall	Hadian	Design																														
ME 490	3	Spring	Pronchick	Design					4.00	96%			4.00	93%	4	97%			3.9	93%													4.2	100%
ME 492	4	Fall	Oppenhein	Design																														
ME 429	4	Spring	Oppenhein	Design																														
ME 494	4	Spring	Oppenhein	Design																									4.05	84%				
	Number meeting:				11	11	1	1	7	6	1	1	12	12	3	3	4	3	2	2	5	4	1	1	5	6	7	7	6	5	1.00	1	1.00	1	4	4
	Percent meeting:				100%	100%	100%	100%	100%	86%	100%	100%	100%	100%	100%	100%	100%	75%	100%	100%	100%	80%	100%	100%	100%	100%	100%	100%	100%	83%	1.00	100%	1.00	100%	100%	100%

3. STATISTICAL DATA

Statistical data is meant to enhance and support program development decisions. These statistics will be attached to the Annual Report of the Program Unit. This statistical document will contain the same data as required for the five-year review including student demographics of majors, faculty and academic allocation, and course data.

Program: Mechanical Engineering	2016-17
A. Students	
1. Undergraduate	191-191
2. Postbaccalaureate	7-4
B. Degrees Awarded	34
C. Faculty	
Tenured/Track Headcount	
1. Full-Time	7
2. Part-Time	1
3a. Total Tenure Track	2
3b. % Tenure Track	28.5
Lecturer Headcount	
4. Full-Time	0
5. Part-Time	1
6a. Total Non-Tenure Track	1
6b. % Non-Tenure Track	22
7. Grand Total All Faculty	8
Instructional FTE Faculty (FTEF)	
8. Tenured/Track FTEF	5.71
9. Lecturer FTEF	0.4
10. Total Instructional FTEF	6.11
Lecturer Teaching	
11a. FTES Taught by Tenure/Track	99.13
11b. % of FTES Taught by Tenure/Track	93.9
12a. FTES Taught by Lecturer	6.4
12b. % of FTES Taught by Lecturer	6.1
13. Total FTES taught	105.53
14. Total SCU taught	1583
D. Student Faculty Ratios	
1. Tenured/Track	17.4
2. Lecturer	16
3. SFR By Level (All Faculty)	17.3
4. Lower Division	21
5. Upper Division	15.3
E. Section Size	
1. Number of Sections Offered	34
2. Average Section Size	20.9
3. Average Section Size for LD	26.4
4. Average Section Size for UD	18.3
6. LD Section taught by Tenured/Track	11
7. UD Section taught by Tenured/Track	21
8. GD Section taught by Tenured/Track	32
9. LD Section taught by Lecturer	0
10. UD Section taught by Lecturer	2