



ANNUAL PROGRAM REPORT

Academic Program	Mechanical Engineering
Reporting for Academic Year	2020-2021
Department Chair	Nader Bagheri
Date Submitted	2/15/2022

1. SELF-STUDY

A. Five-year Review Planning Goals

The last comprehensive Program Review was the ABET Self-Study report which was prepared in July 2019. The next comprehensive Program Review will be the ABET Self-Study report which will be prepared by July 1st of 2025.

B. Five-year Review Planning Goals Progress

The mechanical engineering program has seven student outcomes (SO) which are to be assessed over a two-year period. SO 1, 2, 3, and 6 (Cycle 1) were assessed in 2018-19 year and the results were presented in the 2018-19 Annual Program Report. SO 4, 5, and 7 (Cycle 2) were supposed to have been assessed in 2019-20, but Covid-19 pandemic prevented the department from assessing these outcomes. Cycle 2 outcomes were assessed in 2020-21 and the results are presented in this report.

C. Program Changes and Needs

Courses Removed from Curriculum

Course Number	Course Name	Units	Change	Notes
EGL 120	Technical Communication	3	Removed and replaced by proposed Subarea A1 met in sequence.	Area A1 proposed to be met through sequence of courses within ME, starting with ENG 112
ME 339/ ME 339L	Material/Mechanical Lab and Material/ Mechanical Lab Lab	2/0	Removed and replaced by ME 462/ME 462L	Selected learning outcomes will be reassigned to ME 462/ME 462L
ME 349/ ME 349L	Fluid/Thermal Lab and Fluid/Thermal Lab Lab	2/0	Removed and replaced by ME 462/ME 462L	Selected learning outcomes will be reassigned to ME 462/ME 462L
ME 460L	Autofeedback Control	1	Removed after ME 460 changed to 3 units.	
ME 394	Fluid/Thermal Design	3	Removed from ME curriculum and no longer offered.	Learning outcomes will be reassigned to ME 340: Fluid Mechanics and ME 344: Heat Transfer

Courses Added to the Curriculum

Course Number	Course Name	Units	Change	Notes
Subarea C1	Lower Division Arts & Humanities: Arts	3	Added to meet EO 1100. Students select from established list.	Added to 1 st year roadmap. Enrollment will be division dependent. Will need to be offered in Fall and Spring.
Area C	Lower Division Arts & Humanities	3	Added to meet EO 1100. Students select from established list.	Added to 3 rd year roadmap. May be taken Fall or Spring depending on option.
ENG 112	Introduction to Technical Communication	1	Added as a part of proposed Subarea A1 met in sequence. "C" grade (e.g. C- or better) required to pass the class.	Added to 1 st year roadmap. Enrollment will be division dependent. Will need to be offered in Fall and Spring.
EPO 125L	Introduction to Marine Engineering Lab	1	Course already exists. Supplements EPO 125 and adds lab-based Sea-Time for License Option	Replaces loss of lab-based Sea Time due to merger of ME 339L and ME 349L into ME 462L. Adds missing hand-on component to EPO 125.
ME 462/ ME 462L	Experimental Methods in ME/ Exp. Methods in ME Lab	1/1	Consolidates ME 339/ ME 339L and ME 349/ ME 349L. "C" grade (e.g. C- or better) required to pass the class.	Loss of one lab with lab-based Sea Time made up by addition of EPO 125L.

Courses with Unit Changes

Course Number	Course Name	Units	Change	Notes
MTH 215	Differential Equations	3	Reduces course from 4 units to 3 units.	<i>Based on discussion between ME and SM Departments, topics at the end of the course (Laplace Transforms, Fourier Series) will be removed to reduce units and contact hours.</i>
ME 436/ ME 436L	Mechatronic Systems Design/ Mechatronics System Design Lab	2/1	Takes current 3-unit lecture course and divides it into a 2-unit lecture and 1-unit lab.	Goes from stem course to core ME course. 2-hour lab better suited for hands-on portion of the course, where students need lab equipment and more individual attention. Lab will count for lab-based Sea Time with removal of ME 460L. Lab gains STCW competencies from ME 460.
ME 460	Autofeedback Control	3	Consolidates current 2-unit lecture and 1-unit lab and consolidates into a 3-unit lecture.	Goes from core course to option course for License and Mechanical Design options. Lab based portion removed. All STCW competencies transferred to ME 436L. Moved to 4 th year Spring from 3 rd year Spring.

2. SUMMARY OF ASSESSMENT

A. Program Student Learning Outcomes (SO)

All graduates receiving a Bachelor of Science in Mechanical Engineering degree from the Cal Maritime are expected to have:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. an ability to communicate effectively with a range of audiences
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

B. Program Student Learning Outcome(s) Assessed

Student outcomes 4, 5, and 7 were assessed in 2020-21.

C. Summary of Assessment Process

Instructor Course Assessment (ICA) is the primary tool used to measure achievement of student outcomes. Student works are assessed to measure achievement of course outcomes, and the course outcomes are linked to the student outcomes by each instructor. The mapping of courses to student outcomes can be seen in the Tables below. The benchmark is considered being met by an average assessment of 3 or greater, or 70% of the scores being 3 or greater. The results are presented to the department for evaluation. The findings of the AY 2020-21 assessment are shown below.

D. Summary of Assessment Results

Table 1. Average Assessment Score

Course	SO 4	SO 5	SO 7
ME 349		3.89	
ME 490		4.25	
ME 492	2.89	3.96	4.68
ME 494		4.14	

Table 2. Percentage Scoring 3+

Course	SO 4	SO 5	SO 7
ME 349		100%	
ME 490		100%	
ME 492	56%	85%	100%
ME 494		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.

<i>Program</i>	Fall 2020
<i>A. Students</i>	
1. Undergraduate	
2. Postbaccalaureate	
<i>B. Degrees Awarded</i>	
<i>C. Faculty</i>	
Tenured/Track Headcount	
1. Full-Time	
2. Part-Time	
3a. Total Tenure Track	
3b. % Tenure Track	
Lecturer Headcount	
4. Full-Time	
5. Part-Time	
6a. Total Non-Tenure Track	
6b. % Non-Tenure Track	
7. Grand Total All Faculty	
Instructional FTE Faculty (FTEF)	
8. Tenured/Track FTEF	
9. Lecturer FTEF	
10. Total Instructional FTEF	
Lecturer Teaching	
11a. FTES Taught by Tenure/Track	
11b. % of FTES Taught by Tenure/Track	
12a. FTES Taught by Lecturer	
12b. % of FTES Taught by Lecturer	
13. Total FTES taught	
14. Total SCU taught	
<i>D. Student Faculty Ratios</i>	
1. Tenured/Track	
2. Lecturer	
3. SFR By Level (All Faculty)	
4. Lower Division	
5. Upper Division	
<i>E. Section Size</i>	
1. Number of Sections (non-laboratory courses) Offered	
2. Number of Labs Offered (if any)	
3. Average Section Size	
4. Average Section Size for LD	
5. Average Section Size for UD	
6. LD Section taught by Tenured/Track	
7. UD Section taught by Tenured/Track	
8. GD Section taught by Tenured/Track	
9. LD Section taught by Lecturer	
10. UD Section taught by Lecturer	