

**United States Naval Academy
Mechanical Engineering Department**

Catalog Description: EM472 Mechanical Engineering Design **Credit:** 3 (2-2-3)
Listed as EX486M Multidisciplinary Engineering Design II

Designation: Required, engineering design, capstone course (part 2)

Part two of the two-semester capstone design course sequence. Students continue with concept selection, detail design, prototyping and evaluation of their capstone design projects. Formal presentations and reports are prepared to review and document the designs.

Prerequisites: EM371 Introduction to Design
EM471 Mechanical Engineering Design I or department chair approval

Corequisites: None

Textbooks: Dieter, G. E., & Schmidt, L. C. (2012). *Engineering Design, 5th Ed.* New York: McGraw-Hill.

Course Director: LCDR E. E. Lust, USN

Course Content:

Students spend the vast majority of course time with their teammates working on their capstone projects. Each team has weekly meetings with their adviser. There is no formal presentation of any new topics in this course with the exception of engineering ethics (2 hrs.).

Assessment Methods:

		YES	NO
A	Quizzes	X	
B	Homework	X	
C	Exams		X
D	Laboratory Reports		X
E	Oral Presentations	X	
F	Design Reports/Notebooks	X	
G	Prototypes/Demonstrations	X	
H	Projects		X
I	Other		X

Course Outcomes:

Letters in parenthesis refer to the assessment methods listed in the previous section.

1. Apply (application) appropriate codes as design constraints and standards in the testing and evaluation process. (B,F,G)
2. Communicate (comprehension) the process and design detail effectively through oral presentations and written reports. (E,G)
3. Predict (comprehension) and track progress using project management tools. (E,G)
4. Create (analysis) a prototype of the design or a subsystem for testing and evaluation. (F,G)
5. Evaluate (evaluation) prototype performance (G)
6. Apply (application) results of prototype testing to inform redesign (B,F)
7. Evaluate (evaluation) ethical considerations regarding the design, manufacture, use, and disposal of the design. (A,B,F)
8. Understand (comprehension) the impact of engineering solutions in a global, economic, environmental, and societal context. (B,F)
9. Work (synthesis) effectively in teams, specifically interdisciplinary teams. (E,F,G)
10. Recognize (comprehension) the need to continue to learn beyond the curriculum. (I/II)
11. Demonstrate (comprehension) a knowledge of contemporary issues facing the engineering profession. (E,F)
12. Demonstrate (comprehension) the professionalism required of a professional engineer. (E,F)

Program Outcomes	Course Outcomes											
	1	2	3	4	5	6	7	8	9	10	11	12
(a)					X							
(b)	X				X	X						
(c)	X			X		X	X					
(d)			X						X			
(e)				X	X							
(f)	X	X					X					X
(g)		X										X
(h)								X				X
(i)				X						X		X
(j)											X	X
(k)			X	X	X							X

Date of Latest Revision: 13 JUL 2017, LCDR E. E. Lust, USN