

**United States Naval Academy
Mechanical Engineering Department**

Catalog Description: EM215 Introduction to Mechanical Engineering **Credit:** 3 (1-4-3)
Designation: Required, engineering sciences and design

This is an overview course for Mechanical, General, and Nuclear Engineering majors that introduces the student to the main areas of mechanics, materials, and thermos-science. In addition, it provides background in visualization skills and the design process. Projects are used to enhance the understanding of mechanical engineering and the design process.

Prerequisites: None; for EME, EGE, and ENR majors only
Co-requisites: None.

Textbooks: (1) **Bethune, James, *Engineering Design and Graphics with SolidWorks for 2014. 3rd Ed., Prentice Hall***
(2) **Moore, Holly, *MATLAB for Engineers. 4th Ed., Prentice Hall***

Course Director: Jim Cowart, Prof.

Course Content:

No.	Topic or Subtopic	hrs
1	Orientation to Mechanical Engineering	3
2	Engineering Drawing – Hand Sketching and SolidWorks	12
3	Intro to Thermal-Fluids w/ Lab	5
4	Intro to Mechanics w/ Lab	5
5	Thermo-Fluids Lab Part II	5
6	MATLAB	15
7	Design Process Overview and Exercise	5
8	Research Skills;	3
9	Professional Writing; Documenting Formal Calculations	2
10	Course Design-Build Project	20
	Total →	75

Assessment Methods:

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

Course Outcomes¹

At the conclusion of this course, the student should be able to:

- Outcome 1: **The student will be able to translate between a real object, or an imagined design of a real object, and two-dimensional isometric and orthographic projections of the object using hand sketches and modern visualization software (e.g. Solidworks) (Assessment Method B, C, E, F).**
- Outcome 2: **The student will be able to develop an algorithm to solve an engineering problem by writing a computer program and using tools such as variables, arrays, functions, logical operations, and looping structures (e.g. MATLAB). (Assessment Method B, C, F, H)**
- Outcome 3: **The student will develop written and oral technical communication skills and be able to write a technical memorandum report using an accepted formal structure. (Assessment Method D, E, F)**
- Outcome 4: **The student will be able to perform basic design calculations, and also formulate and execute a project plan as part of an overall design project. (Assessment Method F)**

¹ Letters in parenthesis refer to the assessment methods listed in the previous section.

Program Outcomes	Course Outcomes									
	(1)	(2)	(3)	(4)						
(a)	X	X	X	X						
(b)		X	X							
(c)				X						
(d)				X						
(e)		X								
(f)										
(g)			X							
(h)										
(i)										
(j)										
(k)	X	X								

Date of Latest Revision: 22 APRIL 2017, Professor Jim Cowart