

Date Submitted: 04/07/23 3:10 pm

Viewing: **MMAE 445 : Computer-Aided Design and Manufacturing**

Last edit: 04/07/23 3:10 pm

Changes proposed by: vural

**In Workflow**

1. Registrar
2. MMAE Chair
3. AC Associate Dean
4. Banner

**Approval Path**

1. 04/10/23 12:21 pm  
Khalilah Guyton-Hamlin  
(kguytonhamlin):  
Approved for Registrar
2. 04/10/23 12:26 pm  
Louis Cattafesta III  
(lcattafestaiii):  
Approved for MMAE Chair

Catalog Pages referencing this course  
[Mechanical, Materials, and Aerospace Engineering](#)  
[Mechanical, Materials, and Aerospace Engineering](#)

**Type of Change**

Change Type

Major Change

Requestor Name Murat Vural E-mail vural@iit.edu

This course is for Academic Credits

Effective Term Spring 2024

Subject Code MMAE - Mechl, Mtrls and Arspc Engrg Course Number 445

Department Mechl, Materials & Arspc Engrg College  
 Armour College of Engineering

Long Title Computer-Aided Design and Manufacturing

Abbreviated Title CAD/CAM ~~Computer-Aided Design~~

Contact Hours Lecture 2 ~~3~~ Lab 1 Other 0 Total

Credits 3

Course Description

Explores the principles of blueprints, geometric & dimensional tolerancing, parametric modeling (curve, surface, solid, mesh), mechanical assemblies, finite element analysis (FEA) studies, and design optimization (DFMA) using computer aided design (CAD) software. In addition to the applications of numerical controller programming (G-Code), toolpath generation, and machine simulation using computer aided manufacturing (CAM) software. Principles of geometric modeling, finite element analysis and design optimization. Curve, surface, and solid modeling. Mesh generation, Galerkin method, and Isoparametric elements. Optimum design concepts. Numerical methods for constrained and unconstrained optimization. Applications of CAD/CAE software for mechanical design problems:

## Prerequisites

~~(MMAE 350 or Graduate standing) and (MMAE 304 or MMAE 332 or Graduate standing)~~

## Corequisites

## Equivalent Courses

Default Grade            Standard Letter  
Mode

Is this course eligible for undergraduate students to take as Pass/Fail?

No

## Schedule Types

Lecture

Existing  
Restriction(s)

New Restriction(s)

Other course  
attributes

Course  
Purpose/Reason for  
Change

Two years ago (in 2021), MMAE 445 was removed from being a required course in the Mechanical Engineering curriculum, and has been offered as a tech elective once per year since then. With the joining of INTM to the Armour College of Engineering beginning in fiscal year 2023, we decided to leverage new resources and offer it as a CAD/CAM course rather than a CAD course only. The new MMAE 445 will be offered in both Fall and Spring (probably also in Summer) with a smaller class size and some hands-on

[manufacturing component. Proposed changes have been discussed and approved by the MMAE UG Studies Committee.](#)

Upload Syllabus

[INTM-MMAE 445 - Syllabus - Fall 2023 - Rev 3.pdf](#)

Additional  
Information

Supporting  
Documentation

Reviewer  
Comments

Key: 3845