

# COMPUTER AIDED DESIGN (CAD/CAM/CAE)

Course Code:28675Credits:3Course Type:TheoreticalPrerequisites:Numerical Computation, Machine Element Design 1Corequisite:-Course Length:51 hours

# **Content:**

## SECTION I Computer Aided Design

#### **Chapter 1** Computer Graphics

- 1-1 Mathematical Techniques to display an object in 2D
- 1-2 Mathematical Techniques to display an object in 3D

## Chapter 2 Geometric Modeling



- 2-1 **Wire-Frame**. Types of Parametric Curves including Spline, Bezier and B-Spline
- 2-2 Surface Modeling . Different Methods of representing I Surfaces Including Plane, Bilinear, Lofted, Bicubic, S Bezier and B-Spline Surfaces.
- 2-3 **Solid Modeling**. Different Methods of representing Solids Including CSG(constructive solid geometry) and B-rep (boundary representation)

## **Projects: Using CAD Commercial Software**

## **SECTION II Computer Aided Manufacturing**

## Chapter 3 Machining

Fundamentals of NC, NC Programming with G codes & APT,



NC .Programming from CAD database

#### Chapter 4 Rapid Prototyping (RP)

Applications and Software Technology

#### **Chapter 5 Coordinate Measuring Machine**

Applications and Software Technology

**Chapter 6** Laser Digitize and Image Processing Applications and Software Technology

# SECTION III Computer Aided Engineering

**Chapter 7 Finite Element Modeling (FEM)** 

Introduction, General Procedures and stages,

Types of Elements ,Types of Solutions



#### **Rreferences:**

1- CAD/CAM Theory and Practice By: Ibrahim Zeid. North Eastern University. 2-Computer Aided Design and Manufacturing, By Farid M.L. Amirouche. Unvesity of Illinois.

3-Principles of CAD/CAM/CAE systems By: Kunwoolee. Seoul National University.
4-Mathematical Elements for Computer Graphics. By David F. Rogers- J. – Alan Adams.
5-Finite Element Modeling for Stress Analysis. By: Robert D.Cook