

WICHITA STATE UNIVERSITY
DEPARTMENT OF MECHANICAL ENGINEERING

Computer Aided Engineering

ME - 637

Dr. Behnam Bahr, Mechanical Engineering
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This course will be team taught by Dr. Bahr and graduate students (Rohit and Vivek)

Time: 12:30 - 1:20, T, Th, (Lecture and Lab Demo) 102 EB
 1:30 - 3:20, T, Th, (Lab) 209 EB

Office Hours: 11:00 – 12:30 Th and by appointment.

Goals:

The objective of this course is for senior engineering and beginning graduate students to learn the fundamentals and applications of 3D CAD systems, solid modeling and design of CAD software for ensuring better CAD systems which can be integrated across various aspects of the product development process. This course will teach solid modeling, analysis of designs using Finite Element .

Prerequisite: ME-339 or equivalent, and Math. 555.

Textbooks

- Behnam Bahr, Krishna Krishnan, Rohit Jategaonkar “Computer Aided Engineering,” Available at the University Book Store
- Gary Graham, Dennis Steffen “Inside Pro/Engineer 2001” Onward Press Available at University Book Store

Reference:

- Ibrahim Zeid, CAD/CAM Theory and Practice, McGraw-Hill, Inc., 1991.
- David D. Bedworth, Mark R. Henderson and Philip M. Wolfe, Computer-Integrated Design and Manufacturing, McGraw-Hill, Inc., 1991.

Grade Breakdown

Homeworks	15 %
Exams	30 %
Lab Assignments	30 %
Final Project/Exam	25%
TOTAL	100%

Policies

Lab and Lecture

The lab may not coordinate completely with the material that is being addressed in the theory part of the course.

Exam

Exam is a closed books/notes type unless otherwise stated, and NO make-up tests will be given.

Individual

All lab assignments are individual and have to be completed. A due date will be announced for each Project. Failure to turn in by the due date will constitute grounds for reduction of credit on submitted work. Material from the course lectures, textbook, software manuals and library should be utilized to successfully complete these assignments.

Attendance

All students are expected to attend all sessions of this course. Absence will not excuse students from required assignments. Classroom discussion is an integral part of this course and is essential to the successful completion of this course.

Final Grade

The final grade will be based on the student's performance relative to the class average.

Tentative Course Outline

Introduction (1 class)

History of CAD

CAD – Hardware (1 class)

Input/Output Devices

Color Mapping and Color Table

Geometric Entities (1 classes)

Databases for CAD

Points, Lines, Surfaces & Solids

Wire frame Modeling

Solid Modeling (2 classes)

Spatial Enumeration, Sweep, CSG, B-rep etc.

Representation & Implementation of solid models

Theory of Solid Modeling

Problems with CSG and B-rep

Transformations in CAD (3 classes)

Coordinate Systems in CAD - World, Working and Screen

Translation, Scaling, Reflection, Rotation, Projection, Homogenous & Concatenated transformations (Two Dimensional & Three Dimensional)

Animations

“C” language for CAD (4 Classes)

Intro to “C”

CAD modeling in using “C”

Surfaces (4 classes)

Bezier Surfaces

B-Spline Surfaces

Design for Manufacturing and Assembly (6 classes)

Design Methodologies and Principles

Power Transfer Devices (4 classes)

Gears

Parametric Design of gears

Simulation of Manufacturing Processes (4 classes)

Milling

Turning