PURDUE UNIVERSITY.Department of
Civil and Mech
Engineering

Civil and Mechanical Engineering ME 54600: CAD/CAM and Application Graduate course for MSE-ME concentration

Elective (Group 1) for ME programCatalog DescriptionThis course is to introduce computer-aided design (CAD) and
computer-aided manufacturing (CAM) theory and applications. The
course subjects include CAD/CAM systems, Geometric modeling,
data exchange and integration, mechanical assembly, mechanical
tolerancing, process planning and Tool path generation, integration
of CAD/CAM with the production machine, and Computer control of
machines and processes in manufacturing systems. Projects will
focus on sold modeling for design and manufacturing applications
and the use of commercial CAD/CAM software for automating the
production cycle. Applications include NC machining, design of
(optimum) cutting tools and modeling and design of fixtures for dies
and molds. Hands-on experience is attained through CNC machine
tool laboratory.

Credits

Course

Type of Course

- Contact Hours
- Prerequisite Courses Graduate Standing or ME 36100 with a grade of C or better
- Corequisite Courses None

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TextbookA. Zeid, Mastering CAD/CAM, McGraw-Hill, Inc, 2005

Course Objectives This course is to teach the theory and tools of Computer Aided Design (CAD) and Computer Aided Manufacturing (CAM) with an emphasis on the central role of the geometric model in their seamless integration. It focuses on the integration of these tools and the automation of the product development cycle. It is to introduce geometric modeling techniques, data structure design and algorithms for solid modeling. It also covers the machining theory, automated CNC machining, and process control.

Course Outcomes A student who successfully fulfills the course requirements should be able to:

	 explain the concepts and underlying theory of modeling and the usage of models in different engineering applications (1,2) Create accurate and precise geometry of complex engineering systems and use the geometric models in different engineering applications (2,6). Compare the different types of modeling techniques and explain the central role solid models play in the successful completion of CAD/CAM-based product development (2) Use and assess commercial CAD/CAM tools efficiently, effectively and intelligently in advanced engineering applications (1,2,6) Use current state-of-the-art CAD/CAM technology in research (6) Extend CAD/CAM technology for research and development purposes (1,2,6) Explain the basic concepts of CNC programming and machining (6)
Lecture Topics	 CAD/CAM theory Introduction to CAD/CAM Geometric modeling Computer graphics Product Design and development Product Manufacturing and management Future directions for CAD/CAM CAD/CAM Programming Soldworks CAD/CAM package (labs) CNC machining (labs) ACIS open architecture kernel (labs)
Computer Usage	High
Laboratory Experience	Medium
Design Experiences	Medium
Coordinator	Zhuming Bi, Ph.D.
Date	17 October 2022