The University of Texas at Tyler
Master of Science in Mechanical Engineering

MENG 5340 – CAD/CAM

Syllabus

Catalog Description:

Use of computers to assist in modeling, analysis, design, manufacturing planning and production of engineering objects with software and hardware tools.

Prerequisites: Graduate standing.

Credits: 3 (3 hours lecture, 0 hours laboratory per week)

Text(s): I. Zeid, *Mastering CAD/CAM, 3rd ed.*, McGraw Hill, 2005, ISBN 978-0-072-86845-6

Additional Material: "Principles of Computer-Aided Design and Manufacturing", 2nd Ed. By F. Amirouche, PH, 2004.
"*CAD/CAM*", Groover, et al, PrenHall, 1984.
"*Automation, Production Systems, and Computer- Integrated Manufacturing*", 2nd Ed., Groover, M., Prentice Hall, 2001.
"*Computer Aided Manufacturing*", 2nd Ed., Chang, et al, PrenHall, 1998.

Course Coordinator: Y.J. Lin

Topics Covered:

1. Introduction to CAD/CAM (Ch. 1-5)
2. Geometric Modeling (Ch. 6-10)
3. Graphical Techniques (Ch. 12)
4. Assembly Automation (CAD)
5. Fundamentals of NC (Ch. 22)
6. CNC Part Programming (Ch. 22)

Evaluation Methods: (only items in dark print apply):

1. Examinations / Quizzes
2. Homework
3. Report
4. Computer Programming
5. Project
6. Presentation
7. Course Participation
8. Peer Review

Course Objectives[1]: By the end of this course students will be able to:

1. Evaluate and make an optimal selection of CAD/CAM software tools for specific applications.
2. Build 2D and 3D geometric models of engineering objects based on initial design ideas
3. Select suitable dimensions and material to ensure that a mechanical component meets its design requirements with the assistance of computers
4. Understand geometric transformations required for solid model manipulations
5. Use CAD software to assist mechanical components design and manufacturing

6. Write Manual and APT CNC part programs and debug the errors
7. Develop computer input information for running machining processes simulations
8. Create free form curves and surfaces for building advanced and complex objects
9. Communicate a design and its analysis in written, oral, and graphical forms

[1]*Numbers in brackets refer to method(s) used to evaluate the course objective.*

Relationship to Program Outcomes (only items in dark print apply)[2]: This course supports the following Mechanical Engineering Program Outcomes, which state that our students will:

1. be able to apply science, mathematics, and modern engineering tools and techniques to identify, formulate, and solve engineering problems (1-5,7,9)

2. be able to design thermal/fluid, mechanical, and electro-mechanical components or systems, individually or on interdisciplinary teams, and effectively communicate those designs in both technical and non-technical forums (4,5,6,7)

3. be able to collect, analyze, and interpret data from prescribed and self-designed experimental procedures and formally communicate the results

4. be able to apply a broad-based educational experience to understand the interaction of engineering solutions with contemporary business, economic, and social issues (8)

5. recognize that ethical behavior and continuous acquisition of knowledge are fundamental attributes of successful mechanical engineering professionals (6,8,10)

6. pass the Fundamentals of Engineering examination (1,2)

[2]*Numbers in brackets refer to course objective(s) that address the Program Outcome.*

Contribution to Meeting Professional Component: (in semester hours)

Mathematics and Basic Sciences:		hours
Engineering Sciences and Design:	3	hours
General Education Component:		hours

Prepared By: Y.J. Lin Date: April 17, 2009