

School of Mechanical Engineering and Computer Science
Mech 485: Computer-aided Engineering

Catalog Data:	Mech 485 Computer-aided Engineering; 3 credits Introduction to the use of finite element techniques in engineering product design and analysis; basic concepts and applications in CAE.
Class Schedule:	Three 50-minute lecture sessions per week, for one semester.
Laboratory Schedule:	None
Prerequisites by Course:	Mech 310, Mech 313
Prerequisites by Topic:	Numerical analysis
Required Texts:	Saeed Moaveni, <i>Finite Element Analysis: Theory and Application with ANSYS</i> , Prentice Hall
Course Coordinator:	Dr. Linda (Xiaolin) Chen
Course Objectives:	<ol style="list-style-type: none"> 1. Provide a basic understanding of finite element analysis concept. 2. Apply finite element analysis to the computer-aided design and optimization process. 3. Effectively use a major FEA software tool. 4. Enhance modeling, problem-solving and communication skills through projects.
Topics Covered:	<ol style="list-style-type: none"> 1. Introduction to finite element method 2. Bar and beam elements, linear static analysis 3. Introduction to ANSYS FEA Engineering Analysis Software 4. Plate and shell elements, two-dimensional elasticity analysis 5. Solid elements for three-dimensional problems 6. Computer-aided design and optimization 7. Structural vibration and dynamics
Lab Experiments and Activities:	
Course Outcomes:	Students will be able to:
Assessed for Program Outcomes	E-1. Classify information to identify engineering problems for finite element analysis. G-2. Deliver well-organized, logical oral presentations for projects, including good explanations when questioned. K-4. Use finite element software to simulate physical behaviors of mechanical structures or systems.
	E-2. Develop appropriate finite element models to formulate solutions. E-3. Apply finite element techniques to obtain engineering solutions for linear static and dynamic problems. G-1. Produce project reports, using appropriate formats and grammar. K-3 Use solid modeling software for component and assembly design.

<i>Required or Elective Course:</i>	Elective		
<i>Contribution to Professional Component:</i>	Engineering Topics		
<i>Relationship of Course to Program:</i>	Meets: Educational Objectives <u>1, 2, 4</u> Program Outcomes <u>E, G, K</u>		
<i>Prepared by:</i>	Dr. Linda (Xiaolin) Chen	Date:	October 10, 2008
<i>Approved by CAC:</i>			