WASHINGTON STATE UNIVERSITY
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School of Engineering and Computer Science

MECH 485: Computer-aided Engineering

Catalog Data:		**485 Computer-aided Engineering** 3 Course Prerequisite: MECH 215; MECH 310 or concurrent enrollment. Introduction to the use of finite element techniques in engineering product design and analysis; basic concepts and applications in CAE. Offered at 400 and 500 level. Typically offered Spring.
Class Schedule:		Three 50-minute lecture sessions per week, for one semester.
Laboratory Schedule:		None
Prerequisites by Course:		MECH 215; MECH 310 or c//.
Prerequisites by Topic:		1. Knowledge of linear algebra 2. Understanding of stress, strain and deformation 3. Basic understanding of static and fatigue failure theories
Textbook:		Xiaolin Chen and Yijun Liu, *Finite Element Modeling and Simulation with ANSYS Workbench*, CRC, Press- Taylor & Francis (Recommended)
Course Coordinator:		Dr. Linda (Xiaolin) Chen
Course Objectives:		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:		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:		None
Course Outcomes:		Students will be able to:
	Assessed for Student Outcomes	3-a. Produce project reports for professional audience using discipline-specific conventions, including graph/table, etc. 3-b. Deliver well-organized, logical oral presentations for the simulation projects, including good explanations when questioned. 6-a. Classify information to identify constraints, assumptions and models for finite element simulation. 6-b. Simulate physical behaviors of mechanical structures and/or systems using finite element analysis.
	Other	6-c. Conduct analysis and interpretation of finite element simulation results. 6-d. Draw conclusions from the finite element simulation results to make design recommendations.
Required or Elective Course:		Elective

Relationship of Course to Program:	Meets: Educational Objectives 1, 2, 4 Student Outcomes 3, 6		
Prepared by:	Dr. Linda (Xiaolin) Chen	Date:	March 7, 2018 (04/09/18 mb) Rev. 5-23-19
Approved by USC:	4/9/2018		