PURDUE UNIVERSITY FORT WAYNE | Department of Civil and Mechanical Engineering

Course	ME 48000 – Finite Element Analysis
Cross-listed Course	CE 48000 – Finite Element Analysis
Type of Course	Elective (Group 1) for ME program
Catalog Description	Introduction to the finite-element method through applications to problems in elasticity and heat transfer. Emphasis on one-and two-dimensional problems. Computer implementation.
Credits	3
Contact Hours	3
Prerequisite Courses	None
Corequisite Courses	ME 32100 and ME 36900
Prerequisites by Topics	Fundamental principles of heat transfer, application of principles of strength of materials to the design of typical mechanical components, differential equations, matrices, linear equations, and programming experience.
Textbook	Saeed Moaveni*, Finite Element Analysis: Theory and Application with ANSYS*, Prentice Hall, New Jersey, current edition.
Course Objectives	To provide students with an introduction to Finite Element Analysis and to help the students use this method and commercial software package to solve problems in heat transfer, mechanics of materials and machine design.
Course Outcomes	Students who successfully complete this course will have demonstrated an ability to: 1. Perform finite element formulations for simple engineering problems. **(1,2)** 2. Write simple computer code to apply finite element method. **(1,2)** 3. Use commercial finite element software and understand its structure. **(1,2,6)** 4. Use finite element method to design engineering components and solve engineering problems. **(2,6)** 5. Write formal technical report and convey engineering message efficiently. **(4,7)**

Lecture Topics	1. Introduction to FEA 2. FEA formulations and solution of linear algebraic equations 3. Truss, beam and frame 4. 1-D elements 5. 1-D problems in heat transfer and solid mechanics 6. 2-D elements 7. 2-D problems in heat transfer, solid mechanics and fluid mechanics 8. Introduction to ANSYS and Lab sessions with ANSYS
Computer Usage	High
Laboratory Experience	None
Design Experience	Low
Coordinator	Zhuming Bi, Ph.D.
Date	March 26, 2018