

MENG 4326 – Finite Element Analysis
Course Syllabus

Semester / Year	Spring 2023
Catalog Description	A required introductory course providing undergraduate engineering students with fundamentals of finite element (FE) concepts, analysis, and applications in real-world problems. A software package will be selected for use as a learning support tool, which also provides students with a marketable skill. The course includes a project as a major component.
Prerequisites	MENG 3401 – Thermodynamics, MENG 3309 Mechanical Systems Design (pre-requisite or co-requisite)
Section Number	030
Instructor Name	Dr. Hussain Rizvi
Contact Information	Email: hrizvi@uttyler.edu Office: HEC A220
Class Type / Instruction Mode / Location	Face-to-face / HEC-B210
Class Time	TuTh 2:00 pm -3:20 pm – B210
Office Hours	Mo and We 9:30 – 11:00 am or by appointment
No. of Credits	3 credits
Required Textbook	Finite Element Analysis: Theory and Application with ANSYS – Saeed Moaveni 5 th Edition Finite Element Simulations with ANSYS Workbench 2022: Theory, Applications, Case Studies – Huei-Huang Lee
Optional References	
Additional Rules and Requirements	N/A
Evaluation Method	Report 25%, Two Midterm Exams 50% Homework 20% Quiz 5%
Grading Policy / Scale	Letter grades, scale: A 90 – 100 B 80 – 89



	C 70 – 79 D 60 – 69 F < 60
Important Events / Dates	01/23/2023 (Mo): Census date 02/09/2023 (Th): 1st midterm date 03/23/2023 (Th): Last day to withdraw from one or more classes 03/23/2023 (Th): 2nd midterm date 04/25/2023 (Tu): Report due
Attendance / Makeup policy / other rules	<ol style="list-style-type: none">1. Lecture attendance will be checked using Canvas quiz function.2. No make-up exam(s).3. All assignments MUST be submitted to Canvas for grading.4. Student with SAR status should contact the UT Tyler Office of Student Accessibility and Resources for exam arrangements.
Course Learning Objectives / ABET & PEOs Relation	By the end of this course, students will be able to: <ol style="list-style-type: none">1. Demonstrate an understanding of the fundamental concepts and general steps of the finite element analysis (FEA).2. Apply science and math concepts using FEA tools to identify, formulate and solve engineering problems.3. Apply FEA techniques to engineering design with broader considerations.4. Select and integrate FEA for the appropriate part in the design process to support and justify design decisions with broader considerations.



Tentative Topics / Course Plans	Course Plan:		
	Week (Date)	Topic	HW
	1 (1/10, 1/12)	(Tu) Ch1: Introduction	(Th) Ch1: Direction Formulation
	2 (1/17, 1/19)	(Tu) Ch 1: Direct Formulation	(Th) Ch1: ANSYS Workbench
	3 (1/24, 1/26)	(Tu) Ch 1: Energy Formulation	(Th) Ch1: Weighted Residual
	4 (1/31, 2/2)	(Tu) Ch 3: Trusses	(Th) Ch 3: Space Trusses
	5 (2/7, 2/9)	(Tu) Practice Problems / Review	(Th) 1st Midterm
	6 (2/14, 2/16)	(Tu) Ch 4: Axial Members and Beams	(Th) Ch 4: Frames
	7(2/21, 2/23)	(Tu) Ch 5: One Dimensional Elements	(Th) Ch 7: Two Dimensional Elements
	8(2/28, 3/2)	(Tu) Ch 9: 2D Heat Transfer Problems	(Th) Ch 9: 2D Heat Transfer Problems
	9 (3/7, 3/9)	(Tu) 2D Solid Mechanics Problems	(Th) Ch10: 2D Solid Mechanics Problem
	10(3/14, 3/16)	Spring Break – No Class	
	11 (3/21, 3/23)	(Tu) Practice Problem/ Review	(Th) 2nd Midterm
	12 (3/28, 3/30)	(Tu) Ch11: Dynamic Problems	(Th) Ch 11: Dynamic Problems
	13 (4/4, 4/6)	(Tu) Ch12: Analysis of Fluid Mechanics Problems	(Th) Ch12: Analysis of Fluid Mechanics Problems
	14 (4/11, 4/13)	(Tu) Ch15: Design Optimization	(Th) Ch15: Design Optimization
	15 (4/18, 4/20)	(Tu) Poster Presentation	(Th) Poster Presentation
	16 (4/25, 4/27)	(Tu) Final Project Report	
	(Dr. Rizvi reserves the right to change schedule in course plan.)		
University Policies	https://www.uttyler.edu/academic-affairs/files/syllabus_information_2021.pdf		