

ME 313: Engineering Analysis

<i>Course description:</i>	Analysis and modeling of engineering problems utilizing numerical and mathematical techniques and computers.
<i>Number of credits:</i>	3 (2-3). This course is required.
<i>Course Coordinator:</i>	J.L. Ding
<i>Prerequisites by course:</i>	MATH 315 or concurrent enrollment; CE 215; ME 116; E E 221 or CPT S 121
<i>Prerequisites by topic:</i>	<ol style="list-style-type: none">1. Linear differential equations and systems2. Applications of differential equations3. Mechanics of materials4. Computer-Aided Design and Visualization
<i>Postrequisites:</i>	ME 348
<i>Textbooks/other required materials:</i>	<ol style="list-style-type: none">1. D.L. Logan, <i>A First Course in the Finite Element Method</i>, 5th edition, Cengage Learning, 2012.2. R.H. Shih, <i>Introduction to Finite Element Analysis Using Solid Works Simulation</i>, SDC Publications, 2011.3. MatLab and Simulink Student Suite, MathWorks.
<i>Course objectives:</i>	<ol style="list-style-type: none">1. To introduce the finite element method as an engineering analysis tool.2. To understand the basics of the finite element method.3. To be familiarized with some commercial numerical-analysis tools for solving engineering problems.
<i>Topics covered:</i>	<ol style="list-style-type: none">1. Numerical integration and differentiation2. Direct stiffness method for finite element formulation3. Finite element formulation of differential equations4. Finite element analysis of one dimensional problem5. Introduction to two dimensional finite element analysis6. Hands-on exercises on commercial numerical-analysis software.
<i>Expected learning outcomes:</i>	<ol style="list-style-type: none">1. Understand the theoretical foundation for the finite element method.2. Be able to use some commercial numerical-analysis tools to solve engineering problems.
<i>Class schedule:</i>	Two 50-minute lecture sessions plus one three-hour lab session per week, for one semester.
<i>Contribution to meeting the professional component:</i>	Engineering Topics

Relationship of course to student outcomes:

3 strongly supported; 2 supported; 1 minimally supported

Student Outcomes Pre-Fall 2018
(ABET EC2000)

a	b	c	d	e	f	g	h	i	j	k
3				3						

Student Outcomes Fall 2018 forward
(ABET EC2019)

1	2	3	4	5	6	7
3					3	

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