

# MENG 3624

## Solid Mechanics

### Catalog Description

3624. Solid Mechanics (3) (S) 3 lecture hours per week. P: ENGR 3024. Analysis of structures including static and fatigue failure criteria, column buckling, statically indeterminate structures, impact loading, and the finite element method.

### Text:

1. Hibbeler, R. C., *Mechanics of Materials, Sixth Edition*, Pearson Prentice Hall, 2005. ISBN 0-13-191345
2. Mott, Robert L. *Machine Elements in Mechanical Design, Fourth Edition*, Pearson Prentice Hall, 2004, ISBN 0-13-061885-3.
3. Course Pack – Finite Element Analysis
4. National Council of Examiners for Engineering and Surveying, *Fundamentals of Engineering Supplied-Reference Handbook (8th Edition)*, 2008, ISBN 978-1-932613-30-8.

### Objectives:

At the completion of this course, students will be able to:

- Combine stresses from various loadings on a structure and determine principal stresses.
- Select and apply appropriate static failure criteria for ductile and brittle materials
- Apply failure criteria for fatigue loading
- Analyze statically indeterminate structures
- Design and analyze column members
- Find stresses resulting from impact loading
- Understand the basic principles of finite element analysis
- Perform finite element analysis using a commercial software package

### Course Content:

- Review: Stresses due to axial, torsional, and transverse loading (3 classes)
- Combined stresses, Mohr's circle (3 classes)
- Ductile failure criteria (3 classes)
- Stress concentrations (2 classes)
- Brittle failure criteria (2 classes)
- Fatigue failure criteria (4 classes)
- Statically indeterminate structures (5 classes)
- Column Design (4 classes)
- Impact Loading (6 classes)
- Finite element analysis (8 classes)
- Exams (2 classes)

### Grading:

<b>Grading</b>		<b>Assessment</b>
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A	90% or better		Homework/Assignments	30%
B	80% or better		Tests (2)	40%
C	70% or better		Final Exam	30%
D	60% or better		Total	100%
F	Less than 60%			