EMCH 260 – Introduction to the Mechanics of Solids

Credit hours – 3  Contact hours – 50 minutes MWF or 75 minutes TTh

Instructor – Xinyu Huang

Textbook(s) and/or Other Required Material - Mechanics of Materials (8th Ed), Hibbeler, 2010, Pearson/Prentice Hall

Specific Course information:

b. Prerequisites: EMCH 200 with a grade of C or better and MATH 241
c. Required for BSE in Mechanical Engineering

Course Goals:

a. Outcomes
1. Students will demonstrate the understand the basic concepts of stress and strain at a point
2. Students will demonstrate the ability to apply stress and strain transformations at points
3. Students will demonstrate the ability to understand and use basic equations for stress in simple components subjected to axial loading, torsional loading of cylindrical shafts, bending of bars, shear in bars and internal pressure applied to thin walled structures.
4. Students will demonstrate the ability to understand and use the elastic relationship between stress and strain at a point
5. Students will demonstrate the ability to solve simple statically indeterminate problems for axial loading, torsional loading and bending of bars

b. Relationship of Course to Program Objectives: The importance of each course objective to meeting the program outcomes is indicated with the following scale: 3 = major importance, 2 = moderate importance, 1 = minor importance. Blank if not related.

<table>
<thead>
<tr>
<th>Program Outcomes (see list for complete description)</th>
<th>CO 1</th>
<th>CO 2</th>
<th>CO 3</th>
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<th>CO 5</th>
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<tbody>
<tr>
<td>1.1. analyze, design and realize</td>
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<td>1.2. computation techniques</td>
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<td>1.3. design and interpret experiments</td>
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<td>1.4. apply linear algebra, calculus</td>
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<td>1.5. apply statistical methods</td>
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<td>1.6. understand chemistry and physics</td>
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<td>2.1. engineering economic analyses</td>
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<td>2.2. plan and execute projects</td>
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<td>2.3. oral and written communications</td>
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2.4. professional responsibility
2.5. multi-disciplinary teams
2.6. life-long learning
3.1. engineering in modern society
3.2. literature, arts, humanities.
3.3. foreign language

Topics Covered:
1. Concepts of stress
2. Stress and strain relations
3. Torsion
4. Bending
5. Analysis and design of beams for bending
6. Shear stresses in beams and thin-walled members
7. Transformation of stress and strain
8. Deflection beams

Person who prepared this description and date of preparation:
Michael F. Petrou 02/20/1999
Revised by X. Deng, Aug 2003
Revised by Xiaomin Deng, February 2005
Revised by Yuh J. Chao, August 2005
Revised by X. Deng, August 2006.
New course objectives Feb 2011
Steve McNeill formatted for ABET 2011 – 2/28/11
Approved Xinyu Huang 3/29/11

Changes in course since 2005 ABET visit
New Objectives, faculty review found old objectives were too vague