Instructor: Dr. Hareesh Tippur, Professor of Mechanical Engineering

Contact Info: Room 335, Ross Hall, Phone: 844-3327, e-mail: htippur@eng.auburn.edu

Office Hours: T, R 9:30-10:30 am

Web Site: http://www.eng.auburn.edu/users/htippur/


Course Outline: stress – normal stress, shear stress; strain – normal and shear strains; stress-strain relations – Hooke’s Law; axial loading, stress concentration; torsion of circular sections; bending of beams – bending moment and shear force diagrams; combined loading and pressure vessels; transformation of stresses – principal stresses; failure theories; beam deflection analysis; buckling of columns.

Tentative Text Coverage:
Stress: Chapter-1 (sections 1.1-1.6)
Strain: Chapter-2 (section 2.1-2.2)
Stress-Strain Relations: Chapter-3 (sections 3.1-3.4, 3.6-3.7)
Axial Loading: Chapter-4 (sections 4.1-4.7)
Torsion: Chapter-5 (sections 5.1-5.5)
Bending: Chapter-6, 7 (sections 6.1 – Discontinuity Functions – 12.3, 6.3, 6.4, 6.8, 7.1-7.3)
Combined Loading: Chapter-8 (8.1-8.2)
Stress, Strain Transformations: Chapters 9, 10 (sections 9.1-9.5, 10.1-10.2)
Failure Theories: Chapter 10 (section 10.7)
Deflection of Beams: Chapter-12 (sections 12.1-12.2, 12.7)
Buckling of Columns: Chapter-13 (sections 13.1-13.3)

Evaluation:
30% - Mid-term exams
20% - Quizzes (~8 unannounced quizzes; includes 1 pre-requisite quiz in the second week)
30% - Final exam
20% - Lab Reports
0% - Home works (list of homework problems can be found at the class web-site)

Grading Policy:
Above Class Average: A, B
Below Class Average: C, D, F

Students with special needs: Please contact the instructor in advance.
MECH 3130: Mechanics of Materials
Spring 2003
(Laboratory Component)

Teaching Assistants

Rajesh Kitey (e-mail: kiteyra@eng.auburn.edu)
Saiful Islam (e-mail: islam@eng.auburn.edu)

Office Location: Shop Building 310
Office Hours: To be announced

Labs Meet in Shop Building Room 221

Section-1 Thursday 2-4:30 pm
Section-2 Thursday 5-7:30 pm
Section-3 Friday 5-7:30 pm
Section-4 Friday 2-4:30 pm

Tentative Laboratory Schedule

<table>
<thead>
<tr>
<th>Week #</th>
<th>Monday’s Date</th>
<th>Laboratory Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>January 6</td>
<td>No Lab</td>
</tr>
<tr>
<td>2.</td>
<td>January 13</td>
<td>Lab-1 Moment of Inertia</td>
</tr>
<tr>
<td>3.</td>
<td>January 20</td>
<td>Lab-2 Strain Gage Mounting</td>
</tr>
<tr>
<td>4.</td>
<td>January 27</td>
<td>Lab-3 Uniaxial Testing</td>
</tr>
<tr>
<td>5.</td>
<td>February 3</td>
<td>Lab-4 Torsion Testing</td>
</tr>
<tr>
<td>6.</td>
<td>February 10</td>
<td>Lab-5 Beam Stresses</td>
</tr>
<tr>
<td>7.</td>
<td>February 17</td>
<td>Lab-6 Photoelastic Beam Stress Analysis</td>
</tr>
<tr>
<td>8.</td>
<td>February 24</td>
<td>Lab-7 Beam Deflection Measurement</td>
</tr>
<tr>
<td>9.</td>
<td>March 3</td>
<td>Lab-8 Introduction to FEA - ALGOR</td>
</tr>
<tr>
<td>10.</td>
<td>March 10</td>
<td>Lab-9 FEA of a Truss</td>
</tr>
<tr>
<td>11.</td>
<td>March 17</td>
<td>Lab-10 FEA of Beams</td>
</tr>
<tr>
<td>12.</td>
<td>March 24</td>
<td><strong>Spring Break</strong></td>
</tr>
<tr>
<td>13.</td>
<td>March 31</td>
<td>Lab-11 FEA of Beams</td>
</tr>
<tr>
<td>14.</td>
<td>April 7</td>
<td>Lab-12 FEA of 2-D Components</td>
</tr>
<tr>
<td>15.</td>
<td>April 14</td>
<td>Lab-13 FEA of 2-D Components</td>
</tr>
<tr>
<td>16.</td>
<td>April 21</td>
<td>No lab/Review</td>
</tr>
</tbody>
</table>

General Rules

1. Laboratory Reports are due on the following laboratory period. Late submissions are highly discouraged and penalized.
2. The reports are to be prepared according to the prescribed format.
3. Make-up exams, quizzes, and labs are strongly discouraged. Exceptions are considered only for medical emergencies.