

AY	Revision History: Changes and Rationale	Progress Exam Affected?
07/08	Syllabus Created	N
<b>Catalog Description:</b>	ENSC 301 Mechanics of Materials Behavior of materials, elementary theories of stress and strain, generalization of these theories to stress distribution, and deformation and instability in structural members.	
<b>Textbook(s):</b>	Mechanics of Materials by Beer, Johnston and DeWolf fourth edition 2006 McGraw Hill	
<b>Reference(s):</b>	Mechanics of Materials by Higdson et.al John Wiley and Sons.	
<b>Coordinator:</b>	Anwar S. Khattak, Professor of Civil Engineering	
<b>Course Objectives:</b>	<ol style="list-style-type: none"> <li>1. To understand the basic principles of Mechanics.</li> <li>2. To understand the proper application of the basic principles in analysis</li> <li>3. To understand the proper application of the basic principles in design.</li> </ol>	
<b>Course Outcomes:</b>	<p>By the end of this course the student will be able to:</p> <ol style="list-style-type: none"> <li>1. Calculate stress, strain and elongation in a simple structural component under uniaxial load.</li> <li>2. Calculate stress and strain under biaxial loading condition.</li> <li>3. Draw bending moment and shear force diagrams.</li> <li>4. Determine the deflection in beams.</li> <li>5. Design simple structural components.</li> </ol>	
<b>Course Topics:</b>	Concept of stress, stress and strain-axial loading, torsion, bending of beams, analysis and design of beams, normal and shearing stresses in beams, transformation of stress and strains, Mohr's circle for stress, strain and moment of inertia, deflection of beams, columns	
<b>Student Evaluation:</b>	Students are evaluated on the basis of regular monthly examination and weekly home work assignment. Classroom participation in numerous discussions is also used, however, to a lesser degree to evaluate the student progress in the course.	
<b>Prerequisites by Topic:</b>	Statics ENSC 205 is a prerequisite course. Prerequisites topics include the static equilibrium equations as applied to rigid bodies, method of joints and sections, centroids and center of gravity, moment of inertia, friction and loaded cables and catenary.	
<b>Credits:</b>	3 semester credit hours	
<b>Computer Tools:</b>	MS Word	
<b>Laboratory Content:</b>		

**Design  
Content:**

Basic design calculations of structural components such as beams is covered. Students are introduced to the design of railroad bridge with AREA Specification.

**Relation to  
Curriculum:**

<b>Curricular Component</b>	<input type="checkbox"/> Design	<input type="checkbox"/> Math/Science
<input type="checkbox"/> Engr. M'gmt./Engr. Econ.	<input checked="" type="checkbox"/> Solid Mech./Dynamics	<input type="checkbox"/> Thermo/Fluids
<input checked="" type="checkbox"/> Engineering Computation	<input type="checkbox"/> Electrical Engr.	<input type="checkbox"/> Other Engineering
<input type="checkbox"/> Foundational	<input checked="" type="checkbox"/> Intermediate	<input type="checkbox"/> Advanced