

## Course Outline

ME 345  
Summer 2010

# MECHANICS OF MATERIALS

**Instructor:** Fazıl Önder Sönmez  
**Class hours:** Mondays to Thursdays 9 - 11, (M 2230)  
**Office hours:** Mondays to Thursdays 11 - 12, or drop by  
**Office:** M 4215  
**Phone:** Office: (212) 359-7196, Mobile: (542) 780 6279  
**E-mail:** sonmezfa@boun.edu.tr  
**Prerequisite:** Statics, CE 243

**Course Description (catalog):** Stress and strain. Selected topics in torsion. Simple bending of beams, shearing stresses in beams; beam deflections. Combined stresses due to bending, torsion, shear and axial load. Mohr circle. Design of beams and shafts for strength. Statically indeterminate problems. Introduction to energy methods. Buckling of columns.

**Contribution of the course to the program outcomes:** 1) Knowledge of linear algebra, depth in physics, advanced calculus, differential equations, and engineering sciences along with the ability to apply these towards solutions of elementary mechanical engineering problems; 2) Ability to formulate and solve open-ended problems; 5) Ability to use modern computer tools in mechanical engineering

**Course Objectives:** Analysis and design of common load-carrying components of structural / mechanical systems to ensure that they will not fail.

**Textbook:** Mechanics of Materials, R.C Hibbeler, SI second edition, 2005

<b>Grading:</b>	Quizzes	30 %
	Project	6 %
	Midterms	32 %
	Final	32 %
	Attendance	± 3 %

In quizzes, questions will be similar to the homework assignments.  
Midterms and final are closed book and notes.

### Tentative Course Schedule:

	Fundamental Concepts	(2 hours)
<b>Ch. 1</b>	Stress	(4 hours)
	<b>Quiz 1</b>	
<b>Ch. 2</b>	Strain	(4 hours)
<b>Ch. 3</b>	Introduction to Mechanical Properties of Solids	(2 hours)
	<b>Quiz 2</b>	
<b>Ch. 4</b>	Axial Load	(4 hours)
	<b>Quiz 3</b>	
<b>Midterm 1</b>		
<b>Ch. 5</b>	Torsion	(4 hours)
	<b>Quiz 4</b>	
<b>Ch. 6</b>	Bending	(6 hours)
	<b>Quiz 5</b>	
<b>Ch. 7</b>	Transverse Shear	(2 hours)
	<b>Quiz 6</b>	
<b>Ch. 8</b>	Combined Loadings	(4 hours)
	<b>Quiz 7</b>	
<b>Midterm 2</b>		
<b>Ch. 9</b>	Stress Transformation	(6 hours)
	<b>Quiz 8</b>	
<b>Ch. 12</b>	Deflection of Beams	(4 hours)
	<b>Quiz 9</b>	
<b>Ch. 14</b>	Energy Methods	(6 hours)
	<b>Quiz 10</b>	
<b>Ch. 13</b>	Buckling of Columns	(4 hours)