

## Math 332 (Topics in Applied Math.)

Math 332	Topics in Applied Math.		Credits	Lec	Tut
			3	3	1
Course Summary	Mathematical Preliminaries - Stress and Equilibrium - Material Behaviors-Linear Elastic Solids - Hooke's law - Formulation and Solution Strategies - Principle of Superposition. Strain Energy and Related Principles - Principle of Virtual Work and Principle of Minimum Potential and Complementary Energy.				
Prerequisites	Math 204 & Math205 & Math241	ODEs & Calculus IV & Linear Algebra			
Textbook	Martin H. Sadd	Elasticity, Theory, Applications, and Numeric.	Elsevier, New York	2003	

### Objectives:

1. Explain the mathematical model of the deformation problem.
2. Recognize the relations between stresses and displacement for solid bodies.
3. Describe the traction, displacement, and mixed boundary conditions for structures.
4. Describe key features and operating principles of the general solution strategies for deformation problems.

### Course description:

- Mathematical Preliminaries
- Deformation: Displacements and Strains
- Principal Strains
- Strain Compatibility
- Stress and Equilibrium

- Relations in Curvilinear Cylindrical and Spherical Coordinates
- Material Behaviors-Linear Elastic Solids
- Hooke's law
- Formulation and Solution Strategies
- Boundary Conditions and Fundamental Problem Classifications
- Principle of Superposition
- Strain Energy and Related Principles
- Uniqueness of the Elasticity Boundary-Value Problem
- Principle of Virtual Work and Principle of Minimum Potential and Complementary Energy

## Teaching Schedule:

Delivery Type	Number	Lecture Length (hours)	Student Hours
Lecture	52	1	52
Tutorial	13	1	13
Private Study Hours			117
Total Contact Hours			65
Total Hours			182

## Methods of Assessment:

### 1- Coursework

Assessment Type	Notes (paper HW/Online)	% of Formal Assessment
In-course Assessment	Weekly Paper HW	10
Total Percentage		10

### 2- Exams

Assessment Type	Notes (MCQ, etc ...)	% of Formal Assessment
First Exam	Written	25
Second Exam	Written	25
Final Exam	Written	40
Total Percentage		90