

## Faculty of Engineering & Technology

### Structural Mechanics 1

#### Information :

**Course Code :** SCM 311      **Level :** Undergraduate      **Course Hours :** 3.00- Hours

**Department :** Department of Structural Engineering & Construction Management

#### Instructor Information :

Title	Name	Office hours
Professor	Bahaa sharaf ismail tork	12
Professor	Bahaa sharaf ismail tork	12
Teaching Assistant	Mahmoud Mohamed Khalaf Ahmed	
Teaching Assistant	Ahmed Taher Abdelhamed Mohamed Yousef	
Teaching Assistant	Ahmed Mohamed Abdelnaby Ali Shafay	14

#### Area Of Study :

Formulate and analyze a problem in a simple and logical manner and acquaint themselves with analytical and empirical solutions.

Understand the concepts of force-deformation and stress-strain and enhance their understanding of the concept of stress and strain transformation.

SCM 311: Structural Mechanics (1) 2

Master the evaluation of the straining actions and their effects in terms of stresses and strains on rigid bodies.

Acquires the means of analyzing simple structural members and understand the idea of ultimate and allowable capacities of these members.

#### Description :

Properties of plane areas, Stresses and strains in sections due to axial forces and bending moments, Shear stresses in symmetrical solid and hollow sections, Torsional shear stresses in circular and non-circular sections, Combined stresses, Principal stresses

#### Course outcomes :

##### a. Knowledge and Understanding: :

- 1 - Define the different types of straining actions.
- 2 - Recognize the basic concepts of stresses determinations.

##### b. Intellectual Skills: :

- 1 - Ability to identify, formulate and analyze the engineering problems
- 2 - Ability to derive different solution alternatives for engineering problems .
- 3 - Ability to assess the obtained results accuracy.

##### c. Professional and Practical Skills: :

- 1 - Determine normal stresses in homogenous sections for different straining actions.

2 -	Determine shear stresses in homogenous sections for different straining actions.
3 -	Determine combined stresses in homogenous sections analytically and graphically.
<b>d.General and Transferable Skills :</b>	
1 -	Determine properties of sections.
2 -	Understand the different types of stresses and its theories.

<b>Course Topic And Contents :</b>			
Topic	No. of hours	Lecture	Tutorial / Practical
Introduction: Concept of stress/strains	4	3	1
Properties of cross sections	8	6	2
Straining actions	8	6	2
Normal stresses	12	9	3
Shearing stresses	20	15	5
Combined and principal stresses	8	6	2

<b>Teaching And Learning Methodologies :</b>
Class Lectures
Tutorials

<b>Course Assessment :</b>			
Methods of assessment	Relative weight %	Week No	Assess What
Final exam	40.00		
First Mid Term Exam	25.00		
Performance	10.00		
Second Mid Term Exam	25.00		

<b>Course Notes :</b>
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<b>Recommended books :</b>
Beer, F. P., Russell, J.Jr., DeWolf, J.T. Mechanics of Materials, 4th edition, McGraw Hill, NY, ISBN-13: 9780073107950.
Gere, J.M., Timoshenko, S. Mechanics of Materials, 4th ed., PWS, Boston, 1997.
SCM 311: Structural Mechanics (1) 4
Penham, P.P., Crawford, R.J., Armstrong, C.G. Mechanics of Engineering Materials, 2nd edition, Longman 1997.

<b>Periodicals :</b>
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**Web Sites :**

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