

**Faculty of Engineering & Technology**  
**Strength and Technology of Materials 1**

**Information :**

**Course Code :** SCM 213      **Level :** Undergraduate      **Course Hours :** 3.00- Hours

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

**Instructor Information :**

Title	Name	Office hours
Professor	Mohamed Abdel Moaty Khalaf Mohamed	16
Assistant Lecturer	Youssef Ahmed Elsayed Kamaleldin Ahmed Awad	4
Teaching Assistant	Mohamed Ahmed Reda Abas Ahmed	

**Area Of Study :**

Demonstrate knowledge and understanding of specifications and standard specifications, loads (static . Dynamic . A repeated), testing machines, strain gauges, engineering materials (metallic . Non-metallic), Main properties of engineering materials.

- Understand the behavior of metallic materials subjected to tension, compression, bending, shear torsion, fatigue and impact.

- Know the required test for metallic and non metallic materials subjected to certain load.

The student shall attain the above mentioned objectives efficiently under controlled guidance and supervision during tutorial and lab classes.

**Description :**

Engineering materials, Standardization, Standard specifications, Codes, Total quality concept, Technical inspection and quality control, Principles of materials science, Concrete technology: constituent materials for reinforced concrete (aggregates, cement, mixing water, admixtures, steel reinforcement), Concrete manufacturing, Mechanics of engineering materials: loads, stresses, strains, elastic constants, failure criteria, Mechanical properties, Testing machines, Strain gages, Calibration, Strength and behavior of materials under static loading (tension, compression, bending, shear, torsion, hardness), Miscellaneous conventional and Non-conventional construction materials and products.

**Course outcomes :**

**a. Knowledge and Understanding: :**

1 -	Specifications and standard specifications
2 -	Loads (static . Dynamic . A repeated).
3 -	Testing machines
4 -	Strain gauges
5 -	Engineering materials (metallic . Non-metallic).
6 -	Behavior of metallic materials subjected to tension, compression, bending, shear torsion, fatigue and impact

**b. Intellectual Skills: :**

1 -	Identify properties, advantages, disadvantages and acceptance criteria of
2 -	Recognizing different problems during construction and how to handle them
3 -	Identify the main properties of materials and factors affecting them

**c. Professional and Practical Skills: :**

1 -	Assess the safety of an element subjected to given loads.
2 -	Calculate the required dimensions for an element subjected to given loads
3 -	Perform necessary tests to check the validity of used materials

**d. General and Transferable Skills: :**

1 -	Identify proper test for certain use
2 -	Conduct materials tests
3 -	Present test results

**Course Topic And Contents :**

Topic	No. of hours	Lecture	Tutorial / Practical
Introduction to Properties and Testing of Materials	5	3	2
Main Properties	3	3	-
Testing Machines & its calibration	2		2
Strain Gauge	2		2
Hardness of Metals	4		4
Behavior Of metallic materials subjected to tension	10	6	4
Behavior Of metallic materials subjected to compression	7	3	4
Behavior Of metallic materials subjected to bending	8	6	2
Behavior Of metallic materials subjected to shear and torsion	8	6	2
Behavior Of metallic materials subjected to Impact loading	8	6	2
Behavior Of metallic materials subjected to Fatigue loading	8	6	2

**Teaching And Learning Methodologies :**

Lectures
Tutorials
lab

**Course Assessment :**

Methods of assessment	Relative weight %	Week No	Assess What
11th week exam	15.00		
6th week exam	10.00		
assignments	20.00		
attendance	10.00		
final exam	40.00		

report

5.00

**Course Notes :**

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**Recommended books :**

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**Periodicals :**

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**Web Sites :**

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