FUTURE UNIVERSITY IN EGYPT جامعة المستقبل

## Faculty of Engineering & Technology

## Strength and Technology of Materials 2

**Information :**

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|---|---|---|---|---|---|
| **Course Code :** | SCM 312 | **Level :** | Undergraduate | **Course Hours :** | 3.00- Hours |

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

**Instructor Information :**

| Title | Name | Office hours |
|---|---|---|
| Professor | Osama Abdel Ghafour Ahmad Ahmed Hodhod | |
| Teaching Assistant | Ahmed Taher Abdelhamed Mohamed Yousef | |

**Area Of Study :**

1. Have a clear understanding of concrete constituents.
2. Differentiate between the several types of each constituent, identify the properties, and be aware of testing methods of each constituent.
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3. Comprehend the properties and testing methods of concrete in the fresh and hardened stages.
4. Judge the fresh and hardened concrete quality.
5. Analyze the different alternatives for specific job conditions.

**Description :**

Concrete technology: mix design, properties of fresh and hardened concrete, dimensional changes, concrete manufacturing under severe weathering conditions, durability of concrete in aggressive environments, types and repair of cracks, fire resistance, repairing materials, special types.
Mechanics of engineering materials: stress/strain relations, Mohrûs strain circle, experimental mechanics, mechanisms and theories of failure, strength and behavior of materials under dynamic and repeated loading, high temperature, and creep, Technical Inspection and quality control: technical reports, statistical methods, in-situ testing, non-destructive testing.

**Course outcomes :**

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|---|---|
| **a.Knowledge and Understanding: :** | |
| 1 - | Define Portland cement, concrete aggregates, mixing water, and admixture |
| 2 - | Explain Concrete mix design procedures |
| 3 - | Define Properties of fresh and hardened concrete |
| 4 - | Explain experimental test methods for concrete and concrete materials |
| **b.Intellectual Skills: :** | |
| 1 - | Identify different types of concrete materials, resources, different properties |
| 2 - | Differentiate between the different phases of concrete through its age |
| 3 - | Design concrete mix with different characteristics |

| c.Professional and Practical Skills: : | |
|---|---|
| 1 - | Perform different mix design methods for concrete |
| 2 - | Carryout tests on concrete and concrete materials |
| **d.General and Transferable Skills: :** | |
| 1 - | Work in a team and communicate with others. |

**Course Topic And Contents :**

| Topic | No. of hours | Lecture | Tutorial / Practical |
|---|---|---|---|
| Concrete as a structural material | 5 | 3 | 2 |
| Cement | 15 | 9 | 6 |
| Aggregates | 15 | 9 | 6 |
| Fresh Concrete | 15 | 9 | 6 |
| Hardened Concrete | 15 | 9 | 6 |
| Concrete Mix Design | 10 | 6 | 4 |

**Teaching And Learning Methodologies :**

Lectures

Tutorials

**Course Assessment :**

| Methods of assessment | Relative weight % | Week No | Assess What |
|---|---|---|---|
| 1st Mid Term Exam | 12.50 | | |
| 2nd Mid Term Exam | 12.50 | | |
| Assignments | 10.00 | | |
| Final exam | 40.00 | | |
| Quizzes | 15.00 | | |

**Course Notes :**

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**Recommended books :**

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**Periodicals :**

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**Web Sites :**

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