## Faculty of Engineering & Technology

## Advanced technology of Construction Materials

**Information :**

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| **Course Code :** | SCM 414 | **Level :** | Undergraduate | **Course Hours :** | 3.00- Hours |

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

**Instructor Information :**

| Title | Name | Office hours |
|---|---|---|
| Lecturer | Youssef Ahmed Elsayed Kamaleldin Ahmed Awad | 5 |
| Teaching Assistant | Ahmed Taher Abdelhamed Mohamed Yousef | |

**Area Of Study :**

1. Outline the different types of Advanced Construction Materials
2. Identify the Basic Properties of Advanced Construction Materials (Stiffness characteristics & Strength characteristics)
3. Illustrate the Applications & Fabrication Techniques of Advanced Construction Materials
4. Analyze the results of Advanced Construction Materials tests according to Standard Specifications and codes of practices.
5. Evaluate the behavior of concrete elements strengthened by Advanced Construction Materials

**Description :**

The main concern and focus of this course will be about the Advanced concrete technology, Advanced technology of finishing and insulating materials, Adapted technology of alternative building materials for low-cost construction, New developments and innovative uses of construction materials, Miscellaneous non-conventional construction materials and products : refractories, polymers and plastics, injection materials and joint sealants, composite, optical fibers, carbon fibers, Material-related failures of structures, Maintenance and repair techniques of materials in structures.

**Course outcomes :**

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| **a.Knowledge and Understanding: :** | |
| 1 - | Define the basic types and properties of Advanced Construction Materials |
| 2 - | Explain the behavior of concrete elements strengthened by Advanced Construction Materials under different types of loadings. |
| **b.Intellectual Skills: :** | |
| 1 - | Identify Physical, Chemical & Mechanical properties of Advanced Construction Materials |
| 2 - | Distinguish the different construction materials and their way of use. |
| 3 - | Analyze behavior of fibers and polymers under different types of stresses |
| **c.Professional and Practical Skills: :** | |
| 1 - | Analyze the Fabricate Techniques of Advanced Construction Materials |
| 2 - | Estimate the most appropriate Construction Materials for repair or strengthening of concrete element |
| **d.General and Transferable Skills: :** | |
| 1 - | Share ideas and communicate with others |

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| 2 - | Prepare technical reports related to course topics. |

**Course Topic And Contents :**

| Topic | No. of hours | Lecture | Tutorial / Practical |
|---|---|---|---|
| Introduction to Advanced Construction Materials (ACM) | 10 | 6 | 4 |
| Properties of Fibers Materials | 5 | 3 | 2 |
| Properties of  Polymer Materials | 5 | 3 | 2 |
| Applications & Fabrication Techniques | 5 | 3 | 2 |
| Stiffness Characteristics of ACM | 10 | 6 | 4 |
| Strength Characteristics of ACM | 10 | 6 | 4 |
| Flexural strengthening of c oncrete elements using ACM | 10 | 6 | 4 |
| Shear strengthening of concrete elements using ACM | 10 | 6 | 4 |
| Axial strengthening of concrete elements using ACM | 10 | 6 | 4 |

**Teaching And Learning Methodologies :**

Lectures

Tutorials

**Course Assessment :**

| Methods of assessment | Relative weight % | Week No | Assess What |
|---|---|---|---|
| assignments | 10.00 | | |
| final exams | 40.00 | | |
| mid term exams | 25.00 | | |
| participation | 10.00 | | |
| reports | 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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