Faculty of Engineering & Technology

Advanced technology of Construction Materials

Information :

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	Dina Mahmoud Mohamed Elsayed Mansour	11
Assistant Lecturer	Youssef Ahmed Elsayed Kamaleldin Ahmed Awad	4

Area Of Study :

Understand the difference between the static and dynamic analysis.
Identify the dynamic properties of the structure.
Obtain the response of a SDOF system subjected to harmonic, rectangular pulse and general load.
Identify areas of high, medium and low seismicity in Egypt.
Identify the arrivals of P- and S- seismic waves using the record (time history) of an earthquake.
Calculate, analytically, the seismic response of SDOF systems to idealized ground accelerations (harmonic and rectangular pulses).
Recognize the peak-displacement, peak-velocity, and peak-acceleration portions of a seismic design response spectrum.
Name the causes of plan- and vertical- structural irregularities of buildings.
Apply the equivalent static force procedures and response spectrum methods in seismic design of domestic structures

Description :

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, Introduction to fracture mechanics, Miscellaneous non-conventional construction materials and products : ceramics, refractories, polymers and plastics, injection materials and joint sealants, composite, optical fibers, carbon fibers, Pipes for water and sewage networks, Material-related failures of structures, Maintenance and repair techniques of materials in structures, Welding technology

Course outcomes :

a.Knowledge and Understanding: :	
1 -	Seismic terminology (glossary)
2 -	Effects of structure's dynamic properties on its seismic response
3 -	Methods of earthquake quantification
b.Intellectual Skills: :	
1 -	Reviewing the structural systems of domestic critically to avoid plan and vertical irregularities
2 -	Evaluating, qualitatively, the effects of earthquakes with different magnitudes and epicenter distances on structures
3 -	Recognizing the important effects of structure's dynamic properties on its seismic response

c.Professional and Practical Skills: :	
1 -	Design of domestic structures using the equivalent static force procedure
2 -	Design of domestic structures using the response spectrum method

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Introduction to structural dynamics.	4	3	1
Undamped free vibration analysis of SDOF systems.	4	3	1
Damped free vibration analysis of SDOF systems.	4	3	1
The nature of earthquake ground motion. Seismicity of the world and of Egypt. Causes of earthquakes, basic glossary and terminology. Seismic waves.	4	3	1
Quantification of earthquakes. Characteristics of earthquake ground motions. Philosophy of design.	4	3	1
Response of SDOF system to general dynamic loading.	4	3	1
Seismic response spectral analysis of SDOF systems.	4	3	1
Free vibration analysis of MDOF systems.	4	3	1
Seismic response spectral analysis of MDOF systems.	4	3	1
Linear static seismic lateral force procedures.	4	3	1
Architectural considerations.	4	3	1
Seismic design by ECP-201 I.	4	3	1
Seismic design by ECP-201 II.	4	3	1
Applications using commercial engineering programs I.	4	3	1
Applications using commercial engineering programs II.	4	3	1

Teaching And Learning Methodologies :

Lectures
Tutorials

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
assignmnets	10.00		
attendence	10.00		
doctor's opinion	10.00		
final exams	40.00		
mid term exams	30.00		

Course Notes :
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Recommended books :
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Periodicals :
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Web Sites :
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