FUTURE UNIVERSITY IN EGYPT جامعة المستقبل

Faculty of Engineering & Technology

Advanced Structural Analysis

Information :

Course Code :	SCM 513	**Level :**	Undergraduate	**Course Hours :**	3.00- Hours

Department : Department of Structural Engineering & Construction Management

Instructor Information :

Title	Name	Office hours
Associate Professor	MOHAMED GALAL KHALIL IBRAHIM ELSHERBINI	17
Associate Professor	MOHAMED GALAL KHALIL IBRAHIM ELSHERBINI	17
Assistant Lecturer	MOHAMMED TAHER ABDELHAMID MOHAMMED YOUSSEF	8
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Area Of Study :

At the end of the course, the students will be able to:
Define 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.
List the causes of plan- and vertical- structural irregularities of buildings.
Apply the simplified and multi modal response spectrum methods in seismic design of domestic structures using Egyptian Code for loads.

Description :

Cases of stress and strain in plane and in space, Stress-strain relation, Energy and variational principles, Introduction to the finite element method (element stiffness matrix and force vector, general equations of equilibrium, desemesterination of stresses).

Course outcomes :

a.Knowledge and Understanding: :	
1 -	Define the main terms of free & damped vibration SDF system
2 -	List the main items of characteristics of earthquake ground motions
b.Intellectual Skills: :	
1 -	Calculate the values of free & damped vibration SDF system
2 -	Calculate the values of forced of SDF system
3 -	Solve problems regarding free vibration MDF system

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4 -	- Analyze the system of spectral analysis of SDF systems
5 -	Analyze the system of spectral analysis of MDF systems
6 -	Solve problems regarding equivalent static seismic loads
c.Professional and Practical Skills: :	
1 -	Prepare technical reports for characteristics of earthquake ground motions
d.General and Transferable Skills: :	
1 -	- Search for information and self-learning discipline

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
free & damped vibration SDF system	8	6	2
forced of SDF system	8	6	2
free vibration MDF system	8	6	2
characteristics of earthquake ground motions	8	6	2
spectral analysis of SDF systems	8	6	2
spectral analysis of MDF systems	8	6	2
equivalent static seismic loads	8	6	2
Revision	4	3	1

Teaching And Learning Methodologies :

Interactive Lec.
Discussion
Problem solving
Lab Exper.
Project
Report / Present

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
Assignments and quizes	15.00		
Final exam	40.00		
lap exper.	0.00		
Mid Term Exam	30.00		
report/present	15.00		

Course Notes :

Handouts by the lectures

Recommended books :

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Structural Dynamics, Theory and Computations, Mario Paz
The Seismic Design Handbook, 2nd Edition, F. Naeim (ed.), Van Nostrand Reinhold, New York, 2003.

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