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	14
Associate Professor	MOHAMED GALAL KHALIL IBRAHIM ELSHERBINI	14
Associate Professor	MOHAMED GALAL KHALIL IBRAHIM ELSHERBINI	14
Assistant Lecturer	MOHAMMED TAHER ABDELHAMID MOHAMMED YOUSSEF	8
Assistant Lecturer	MOHAMMED TAHER ABDELHAMID MOHAMMED YOUSSEF	8
Assistant Lecturer	MOHAMMED TAHER ABDELHAMID MOHAMMED YOUSSEF	8
Assistant Lecturer	Dina Hesham Mohamed Helmy	6

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
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 :

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