

## 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
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Assistant Lecturer	MOHAMMED TAHER ABDELHAMID MOHAMMED YOUSSEF	8
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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, desemersterination 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



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**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.