



Course Descriptor CVEN521 Dynamics of Structures

ACADEMIC YEAR	2018-2019	SEMESTER	Fall
Course Code	CVEN 521	Course Title	Dynamics of Structures
Credit hours	3	Level of study	Year 5
College / Centre	Engineering	Department	CVEN
Co-requisites		Pre-requisites	ENGR 321 CVEN 340

1. COURSE OUTLINE

[This course analyses the fundamental principles of structural dynamics. This includes dynamic modelling of damped and undamped single degree of freedom free vibration. In addition, an introduction for multi-degree of freedom systems is provided. It concludes with the topics of eigenvalues, eigenvectors or eigenmode shapes.

2. AIMS

[The course provides students with general understanding of the phenomena related to structural dynamics with a focus on earthquake engineering.

3. LEARNING OUTCOMES, TEACHING, LEARNING and ASSESSMENT METHODS

Learning Outcomes (<i>Definitive</i>)	Teaching and Learning methods (<i>Indicative</i>)	Assessment (<i>Indicative</i>)
Upon successful completion of this course, students will be able to:		
1. Evaluate the principles of structural dynamics	Lectures and Tutorials	Assignments & Examinations
2. Apply the concept of Idealizing complex systems into single degree of freedom components	Lectures and Tutorials	Assignments & Examinations
3. Analyze the behavior of structures under different loading conditions.	Lectures and Tutorials	Assignments & Examinations

4. ASSESSMENT WEIGHTING

Assessment	Percentage of final mark (%)
Assignments	40%
Mid term	20%
Final Exam	40%
TOTAL	100%



Course Descriptor ENGR321 Dynamics

5. ACHIEVING A PASS

Students will achieve 3 credit hours for this course by passing **ALL** of the course assessments and achieving a **minimum overall score of 50%**.

NB *Ensure that ALL learning outcomes are taken into account

6. COURSE CONTENT (Indicative)

WEEK	LECTURE TOPIC	TIME (HOURS)
1	Introduction in structural dynamics (importance and applications)	1.5
		1.5
2	Analysis of Free Vibrations	1.5
		1.5
3	Response to Harmonic Loading	1.5
		1.5
4	Response to Periodic Loading	1.5
		1.5
5	Response to Impulsive Loading	1.5
		1.5
6	Response to General Dynamic Loading: Super position Methods	1.5
		1.5
7	Response to General Dynamic Loading	1.5
		1.5
8	Generalized Single-Degree-of-Freedom Systems	1.5
		1.5
9	Formulation of the Multi Degree of Freedom Equations of Motion	1.5
		1.5
10	Undamped Free Vibrations	1.5
		1.5
11	Analysis of Dynamic Response Using Superposition	1.5
		1.5
12	Introduction to multi degree of freedom systems	1.5
		1.5
13	Analysis of the Multi Degree of Freedom dynamic response	1.5
		1.5
14	Variational Formulation of the Equations of Motion	1.5
		1.5
15	Summary	1.5
		1.5
	TOTAL HOURS	45
1 - 15	Plus RECOMMENDED INDEPENDENT STUDY HOURS	90
	TOTAL COURSE HOURS	135

+7. RECOMMENDED READING

Core text/s:

Clough R., Penzien J., "Dynamics of Structures", Second Edition (revised), Computer and Structures Inc., 2003.

Chopra A., "Dynamics of Structures", Prentice Hall, Fourth Edition, 2011.

Library + online resources: