

CA8011: EARTHQUAKE AND OFFSHORE ENGINEERING

Effective Term

Semester B 2024/25

Part I Course Overview

Course Title

Earthquake and Offshore Engineering

Subject Code

CA - Civil and Architectural Engineering

Course Number

8011

Academic Unit

Architecture and Civil Engineering (CA)

College/School

College of Engineering (EG)

Course Duration

One Semester

Credit Units

3

Level

R8 - Research Degree

Medium of Instruction

English

Medium of Assessment

English

Prerequisites

Nil

Precursors

Nil

Equivalent Courses

BC8011 Earthquake and Offshore Engineering

Exclusive Courses

Nil

Additional Information

Some courses offered in Summer Term may start a few weeks earlier than the normal University schedule. Please check the teaching schedules with CLs before registering for the courses.

Part II Course Details

Abstract

The course provides fundamental knowledge and design principles in earthquake and offshore engineering.

Course Intended Learning Outcomes (CILOs)

CILOs		Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	apply fundamental principles of structural dynamics;	20	x		
2	analyze dynamic response of structures;	20		x	
3	analyze stationary random vibration in sea wave;	20		x	
4	analyse time series and random vibration in earthquake;	20		x	
5	apply theories to design.	20	x	x	x

A1: Attitude

Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability

Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

A3: Accomplishments

Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

Learning and Teaching Activities (LTAs)

LTAs		Brief Description	CILO No.	Hours/week (if applicable)
1	Lecture	Knowledge transfer	1, 2, 3, 4	2
2	Discussion	Knowledge application	1, 5	1

Additional Information for LTAs

Semester Hours:

- 3 hours per week

Lecture/Tutorial/Laboratory Mix:

- Lecture (-); Tutorial (-); Laboratory (-)

- 3 hours per week including lectures, tutorial and laboratory sessions

Assessment Tasks / Activities (ATs)

ATs		CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Essay and Lab Project	1, 2, 3, 4	60	
2	Presentation	1, 5	20	
3	Mid-term test	3, 4	20	

Continuous Assessment (%)

100

Examination (%)

0

Assessment Rubrics (AR)

Assessment Task

Essay and Lab Project (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Understand and apply theories and knowledge in offshore engineering

Excellent

(A+, A, A-) High

Good

(B+, B, B-) Presentable

Fair

(C+, C, C-) Comfortable

Marginal

(D) Just acceptable

Failure

(F) Below marginal

Assessment Task

Presentation (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Test the presentation skill

Excellent

(A+, A, A-) High

Good

(B+, B, B-) Presentable

Fair

(C+, C, C-) Comfortable

Marginal

(D) Just acceptable

Failure

(F) Below marginal

Assessment Task

Mid-term test (for students admitted before Semester A 2022/23 and in Semester A 2024/25 & thereafter)

Criterion

Ability to understand and apply theories and knowledge

Excellent

(A+, A, A-) High

Good

(B+, B, B-) Presentable

Fair

(C+, C, C-) Comfortable

Marginal

(D) Just acceptable

Failure

(F) Below marginal

Assessment Task

Essay and Lab Project (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

Understand and apply theories and knowledge in offshore engineering

Excellent

(A+, A, A-) High

Good

(B+, B) Presentable

Marginal

(B-, C+, C) Acceptable

Failure

(F) Not even reaching marginal levels

Assessment Task

Presentation (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

Test the presentation skill

Excellent

(A+, A, A-) High

Good

(B+, B) Presentable

Marginal

(B-, C+, C) Acceptable

Failure

(F) Not even reaching marginal levels

Assessment Task

Mid-term test (for students admitted from Semester A 2022/23 to Summer Term 2024)

Criterion

Ability to understand and apply theories and knowledge

Excellent

(A+, A, A-) High

Good

(B+, B) Presentable

Marginal

(B-, C+, C) Acceptable

Failure

(F) Not even reaching marginal levels

Part III Other Information

Keyword Syllabus

Free vibration: one- and multi-degrees of freedom system. Newmark integration. Earthquake time series. Time response to earthquake. Wave force. Stationary random response. Non-stationary random response. Torsion response. Design of building structures for earthquake. Offshore structures.

Reading List

Compulsory Readings

Title	
1	Nil

Additional Readings

Title	
1	Anil K. Chopra. Dynamics of structures: theory and applications to earthquake engineering. Upper Saddle River, NJ : Prentice Hall, c2001; 2nd edition.
2	J.M.T. Thompson, H.B. Stewart. Nonlinear dynamics and chaos. Chichester ; New York : Wiley, c2002; 2nd ed.