

CA5244: GEOTECHNICS & CIVIL ENGINEERING INFRASTRUCTURES

Effective Term

Semester A 2025/26

Part I Course Overview

Course Title

Geotechnics & Civil Engineering Infrastructures

Subject Code

CA - Civil and Architectural Engineering

Course Number

5244

Academic Unit

Architecture and Civil Engineering (CA)

College/School

College of Engineering (EG)

Course Duration

One Semester

Credit Units

3

Level

P5, P6 - Postgraduate Degree

Medium of Instruction

English

Medium of Assessment

English

Prerequisites

Nil

Precursors

Nil

Equivalent Courses

Nil

Exclusive Courses

Nil

Part II Course Details

Abstract

The course will introduce basic and more advanced concepts of methods of analysis in geotechnics and civil engineering infrastructure systems, providing scientific background and empirical/analytical approaches to solve various problems.

Course Intended Learning Outcomes (CILOs)

CILOs		Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Discuss fundamental concepts and theories of engineering mechanics and engineering physics/mathematics applied in civil engineering and geotechnics.		x	x	
2	Apply methods of analysis to solve relatively simple engineering systems and express mathematically physical phenomena of significance to civil engineering.		x	x	
3	Design modelling strategies for the equilibrium of forces/moments in engineering systems.		x	x	
4	Design appropriate schemes to solve various geotechnics problems.		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	Lectures	Students will engage in formal lectures to gain knowledge about fundamental concepts and theories in geotechnics and civil engineering systems.	1, 2, 3, 4	
2	Tutorials	Students will engage in the step-by-step solution of problems and discussion of the application of theories in selected topics taught during the lectures.	1, 2, 3, 4	

Additional Information for LTAs

Semester Hours: 3 hours per week

Lecture/Tutorial/Laboratory Mix: Lecture (0); Tutorial (0); Laboratory (0)

3 hours per week including lectures and tutorials

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks ("- for nil entry)	Allow Use of GenAI?
1	Assignment(s)	1, 2, 3, 4	30		Yes
2	Mid-term Test	1, 2, 3, 4	20		No

Continuous Assessment (%)

50

Examination (%)

50

Examination Duration (Hours)

2

Minimum Continuous Assessment Passing Requirement (%)

30

Minimum Examination Passing Requirement (%)

30

Additional Information for ATs

To pass a course, a student must obtain minimum marks of 30% in both coursework and examination components, and an overall mark of at least 40%

Assessment Rubrics (AR)

Assessment Task

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

Criterion

ABILITY to DESCRIBE fundamental concepts and theories in geotechnics and civil engineering infrastructure systems and CAPACITY to ANALYZE the stability of engineering systems.

Excellent

(A+, A, A-) High

Good

(B+, B, B-) Significant

Fair

(C+, C, C-) Moderate

Marginal

(D) Basic

Failure

(F) Not even reaching marginal levels

Assessment Task

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

Criterion

CAPACITY to ANALYZE the stability of engineering systems.

Excellent

(A+, A, A-) High

Good

(B+, B, B-) Significant

Fair

(C+, C, C-) Moderate

Marginal

(D) Basic

Failure

(F) Not even reaching marginal levels

Assessment Task

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

Criterion

ABILITY to DESCRIBE fundamental concepts and theories in geotechnics and civil engineering infrastructure and CAPACITY to analyze engineering systems.

Excellent

(A+, A, A-) High

Good

(B+, B, B-) Significant

Fair

(C+, C, C-) Moderate

Marginal

(D) Basic

Failure

(F) Not even reaching marginal levels

Assessment Task

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

Criterion

ABILITY to DESCRIBE fundamental concepts and theories in geotechnics and civil engineering infrastructure systems and CAPACITY to ANALYZE the stability of engineering systems.

Excellent

(A+, A, A-) High

Good

(B+, B) Significant

Marginal

(B-, C+, C) Basic

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

CAPACITY to ANALYZE the stability of engineering systems.

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

Criterion

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Part III Other Information

Keyword Syllabus

Foundation engineering, geotechnics, civil engineering infrastructures, civil engineering systems.

Reading List

Compulsory Readings

Title	
1	Nil

Additional Readings

Title	
1	Coduto, D.P. (2001). Foundation Design: Principles and Practices. 2nd Ed. Prentice-Hall.
2	Craig, R.F. (2004). Craig's Soil Mechanics. 7th Ed. Spon Press
3	Atkinson (1993). An Introduction to the Mechanics of Soils and Foundations. Mc-Graw-Hill
4	Mitchell, J. K. and Soga, K. (2005). Fundamentals of Soil Behavior. Wiley
5	Budhu M., Foundations and Earth Retaining Structures, (2007), John Wiley & Sons, Inc