City University of Hong Kong
Course Syllabus

offered by Department of Architecture and Civil Engineering
with effect from Semester A 2022/23

Part I Course Overview

Course Title:	Geotechnical and Foundation Engineering
Course Code:	CA5693
Course Duration:	1 Semester (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.)
Credit Units:	3
Level:	P5
Medium of Instruction:	English
Medium of Assessment:	English
Prerequisites: *(Course Code and Title)*	Nil
Precursors: *(Course Code and Title)*	Nil
Equivalent Courses: *(Course Code and Title)*	Nil
Exclusive Courses: *(Course Code and Title)*	Nil

Part II Course Details

1. Abstract

The course introduces advanced concepts and theories in geotechnical and foundation engineering. Numerical methods will also be introduced to solve geotechnical design problems.

2. Course Intended Learning Outcomes (CILOs)

(CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)

No.	CILOs	Weighting (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	*A2*	*A3*
1.	explain the importance of advanced concepts and theories in geotechnical and foundation engineering;			✓	
2.	solve geotechnical and foundation problems using commercial computer software;			✓	
3.	carry design for geotechnical structures, such as slopes, retaining walls and foundations;			✓	
4.	select appropriate theories to analyze various geotechnical structures.			✓	
		100%			

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 self-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.

3. Teaching and Learning Activities (TLAs)
(TLAs designed to facilitate students' achievement of the CILOs.)

TLA	Brief Description	CILO No.				Hours / week (if applicable)
		1	2	3	4	
Lectures	Cover various aspects of geotechnical and foundation engineering	✓	✓	✓	✓	
Tutorials	Cover various aspects of geotechnical and foundation engineering		✓	✓		

Semester Hours:	3 hours per week
Lecture/Tutorial/Laboratory Mix:	Lecture (2); Tutorial (1); Laboratory (0)

4. Assessment Tasks/Activities
(ATs are designed to assess how well the students achieve the CILOs.)

Assessment Tasks / Activities	CILO No.				Weighting	Remarks
	1	2	3	4		
Continuous Assessment: 50%						
Assignment and in-class exercises	✓	✓	✓	✓	30%	
Mid-term quiz	✓	✓	✓	✓	20%	
Examination: 50% (duration: 3 hour(s))						
Examination					50%	
					100%	

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%

5. Assessment Rubrics

(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)

Applicable to students admitted in Semester A 2022/23 and thereafter

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B)	Marginal (B-, C+, C)	Failure (F)
Assignment and in-class exercises	Ability to understand and apply analysis and design methods in geotechnical and foundation engineering	High	Significant	Basic	Not even reaching marginal levels
Mid-term quiz	Ability to understand and apply analysis and design methods in geotechnical and foundation engineering	High	Significant	Basic	Not even reaching marginal levels
Examination	Ability to understand and apply analysis and design methods in geotechnical and foundation engineering	High	Significant	Basic	Not even reaching marginal levels

Applicable to students admitted before Semester A 2022/23

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
Assignment and in-class exercises	Ability to understand and apply analysis and design methods in geotechnical and foundation engineering	High	Significant	Moderate	Basic	Not even reaching marginal levels
Mid-term quiz	Ability to understand and apply analysis and design methods in geotechnical and foundation engineering	High	Significant	Moderate	Basic	Not even reaching marginal levels
Examination	Ability to understand and apply analysis and design methods in geotechnical and foundation engineering	High	Significant	Moderate	Basic	Not even reaching marginal level

Part III Other Information (more details can be provided separately in the teaching plan)

1. Keyword Syllabus
(An indication of the key topics of the course.)

Advanced designs of deep excavation, shallow and deep foundations, ground Settlement due to Tunneling, Ground Improvement, Geotechnical construction techniques, Land reclamation, Geotechnical risk and reliability, Numerical Analysis, Use of computer software to solve common geotechnical problems associated with empirical relationships, seepage, consolidation, pile applications, excavations, and general soil behavior.

2. Reading List

2.1 Compulsory Readings
(Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)

1.	Nil

2.2 Additional Readings
(Additional references for students to learn to expand their knowledge about the subject.)

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.	Das B.M. 1999. Principles of Foundation Engineering. 4th Ed. PWS Publishing.
4.	Geotechnical Control Office (GCO) 1984. Geotechnical Manual for Slopes. The Government of Hong Kong Special Administration Region, 2nd Edition, Hong Kong.
5.	Geotechnical Control Office (GCO) 1987. Geoguide 2: Guide to Site Investigation. The Government of Hong Kong Special Administration Region. Hong Kong.
6.	Geotechnical Control Office (GCO) 1987. Geoguide 3: Guide to Soil and Rock Descriptions. The Government of Hong Kong Special Administration Region. Hong Kong.
7.	Geotechnical Engineering Office (GEO) 1993. Geoguide 1: Guide to Retaining Wall Design. 2nd Edition, The Government of Hong Kong Special Administration Region, Hong Kong.
8.	Muir Wood, D. 1990. Soil Behaviour and Critical State Soil Mechanics. Cambridge University Press.
9.	Powrie, W. 2004. Soil Mechanics: Concepts and Applications. 2nd Ed. Spon Press.
10.	Atkinson & Bransby 1978. The Mechanics of Soils. McGraw-Hill
11.	Atkinson 1993. An Introduction to the Mechanics of Soils and Foundations. Mc-Graw-Hill.
12.	Mitchell, J. K. and Soga, K. 2005. Fundamentals of Soil Behavior. Wiley.