CA3144: ENGINEERING SURVEYING

Effective Term
Semester A 2024/25

Part I Course Overview

Course Title
Engineering Surveying

Subject Code
CA - Civil and Architectural Engineering
Course Number
3144

Academic Unit
Architecture and Civil Engineering (CA)

College/School
College of Engineering (EG)

Course Duration
One Semester

Credit Units
3

Level
B1, B2, B3, B4 - Bachelor's Degree

Medium of Instruction
English

Medium of Assessment
English

Prerequisites
Nil

Precursors
Nil

Equivalent Courses
BC3144/BC3144F/BC3144P Engineering Surveying

Exclusive Courses
Nil

Part II Course Details

Abstract
The course aims to provide students with an understanding of the principles of engineering surveying and basic surveying computation techniques for building and civil engineering projects. The course is also to develop the ability of carrying

The course aims to provide students with an understanding of the principles of engineering surveying and basic surveying computation techniques for building and civil engineering projects. The course is also to develop the ability of carrying out ordinary levelling, angular measurements using total stations, direct distance measurements using ordinary tapes, and other types of indirect distance measurements. The course provides students with practical opportunities to operate various modern electronic surveying instruments.

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Describe and identify the appropriate surveying skills and methods for measuring relative heights, horizontal and vertical angles and distances;	25	x		
2	Describe and identify the importance of various types of errors during measurements and adopt different kinds of methods for the error adjustments;	25	x		
3	Describe and identify the appropriate formulas for calculating coordinates and producing different kinds of survey maps	25			x
4	Identify the appropriate procedures of setting out engineering layout details on site.	25		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	Students will engage in lectures to gain the knowledge about the principles and formulations	1, 2, 3, 4	2 hours/week
2	Laboratory Practice	Demonstration classes for Level, Total Station, and GPS 4 Lab classes for levelling, triangulation, resection, setting out	1, 2, 3, 4	1 hour/week

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Lab Report	1, 2, 3, 4	10	
2	Test	1, 2, 3	20	
3	Two assignments	1, 2, 3, 4	20	

Continuous Assessment (%)

50

Examination (%)

50

Examination Duration (Hours)

3

Minimum Continuous Assessment Passing Requirement (%)

30

Minimum Examination Passing Requirement (%)

30

Assessment Rubrics (AR)

Assessment Task

Lab Report

Criterion

ABILITY to UNDERSTAND the practical measurement procedures, data collection methods, analysis methods and engineering interpretations of all measured and calculated results

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

Test

Criterion

ABILITY to UNDERSTAND the taught methodology and procedures in handling measured data and result calculations

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

Criterion
ABILITY to UNDERSTAND the taught methodology and procedures in both lectures and laboratories solving practical and daily problems

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

Criterion
ABILITY to UNDERSTAND the practical measurement procedures, data collection methods, analysis methods and engineering interpretations of all measured and calculated results

Excellent (A+, A, A-)
High

Good (B+, B, B-)
Significant

Fair (C+, C, C-)
Moderate

Marginal (D)

Basic

Failure (F)
Not even reaching marginal level

Part III Other Information

Keyword Syllabus

Concept of indeterminacy, principle of superposition. Method of consistent deformations. Slope deflection method. Moment distribution method. Stiffness (displacement) matrix method. Lack-of-fit, support settlement, temperature effects. Modern approaches to structural analysis of frameworks. Influence line. Classical approaches to structural analysis of beams/frames.

Reading List

Compulsory Readings

	Title
1	Kavanagh, Barry F. & Mastin, Tom B. 2014, Surveying: Principles and Applications, 9th Edition, Pearson
2	William Irvine & Finlay Maclennan 2006, Surveying for construction. McGraw-Hill Education

Additional Readings

	Title
1	Bannister A. & Raymond S. 1984, Surveying, 5th Edition, Pitman
2	Morris, Alan S. 2001, Measurement and Instrumentation Principles, Oxford, Boston: Butterworth-Heinemann
3	Kavanagh, Barry F. & Glenn Bird, S.J. 2000, Surveying: Principles and Applications, 5th Edition, Upper Saddle River, N.J.: Prentice Hall
4	Roy, S.K. 1999, Fundamentals of Surveying, New Delhi: Prentice-Hall of India
5	Anderson, James M. & Mikhail, Edward M. 1998, Surveying: Theory and Practice, 7th Edition, Boston, Mass: WCB/ McGraw-Hill
6	Whyte, W.S. & Paul, R.E. 1997, Basic Surveying, 4th Edition, Oxford; Boston: Butterworth-Heinemann
7	Moffitt, Francis H. & Bossler, John D. 1998, Surveying, 10th Edition, Menlo Park, Calif. : Addison-Wesley
8	http://www.landsd.gov.hk