

CA3144: ENGINEERING SURVEYING

Effective Term

Semester A 2022/23

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

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 DEC-A1 DEC-A2 DEC-A3 app.)			
1	Apply the various surveying skills and methods to measure relative heights, horizontal and vertical angles and distances;	25	x		
2	Analyze various types of errors during measurements and adopt different kinds of methods for the error adjustments;	25	x		
3	Generate coordinates and produce different kinds of survey maps;	25			x
4	Explain the 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.

Teaching and Learning Activities (TLAs)

TLAs		Brief Description	CILO No.	Hours/week (if applicable)
1	Lecture	Explain key concepts and all theories related to engineering surveying	1, 2, 3, 4	2 hours/week in 13 weeks
2	Laboratory Practice	2 Demonstration classes for Level, Total Station, and GPS 4 Lab classes for Leveling, Triangulation, Resection, Setting out	1, 2, 3, 4	3 hours/week in 6 weeks
3	Mid-term quiz	Test students' understanding on taught materials	1, 2, 3	

Assessment Tasks / Activities (ATs)

ATs		CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Lab Report	1, 2, 3, 4	30	
2	Mid-term quiz	1, 2, 3	20	

Continuous Assessment (%)

50

Examination (%)

50

Examination Duration (Hours)

2

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

Mid-term quiz

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

Part III Other Information**Keyword Syllabus**

National datum. National network of horizontal and vertical control points. Ordinary levelling. Contouring and sectioning. Distance measurement using tapes. Electronic Distance Measurement (EDM). Total stations. Global Positioning System (GPS). Control surveys. Traversing. Traverse computations and adjustment. Construction setting out. Angle and Distance Resection.

Reading List**Compulsory Readings**

Title	
1	Kavanagh, Barry F. & Mastin, Tom B. 2014, Surveying: Principles and Applications, 9th Edition, Pearson
2	William Irvine & Finlay Maclellan 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