

CA2123: ENGINEERING METHODS

Effective Term

Semester A 2024/25

Part I Course Overview

Course Title

Engineering Methods

Subject Code

CA - Civil and Architectural Engineering

Course Number

2123

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

BC2123/BC2123P Engineering Methods

Exclusive Courses

Nil

Part II Course Details

Abstract

The course aims to provide an understanding of the fundamental principles of economics and explore their applications in the land conversion process.

Course Intended Learning Outcomes (CILOs)

CILOs		Weighting (if DEC-A1 DEC-A2 DEC-A3 app.)			
1	describe economic decision-making in property development		x		
2	explain basic economic concepts in the context of property development		x		
3	identify the market structure of the construction industry			x	
4	apply basic quantitative approaches for property valuation				x
5	discuss the applications of various valuation methods in property development			x	
6	apply the cost and value assessment in property development			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 formal lectures to gain knowledge for achieving the CILOs	1, 2, 3, 4, 5, 6	2
2	Tutorial	Students will engage in tutorial activities to extend their learning by involving in class discussions and exercises	1, 2, 3, 4, 5, 6	1
3	Projects	Students will participate in assignment projects, conduct property valuation and land appraisal, and present their findings for critical discussion.	1, 2, 4, 5, 6	

Assessment Tasks / Activities (ATs)

ATs		CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Assignment	1, 2, 3, 4, 5, 6	30	
2	Mid-term test	1, 2, 3, 4, 5, 6	20	

Continuous Assessment (%)

50

Examination (%)

50

Examination Duration (Hours)

2

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

Criterion

1. Capacity to explore various valuation methods and give advice on the commercial viability of the property development
2. Ability to conduct property valuation and land appraisal

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

Criterion

ABILITY to APPLY the basic principle and the scientific techniques in solving the problems involved in (1) Multiple integrals for finding volume, area, mass and inertia moment of structures, (2) Ordinary differential equation and (3) curve fitting techniques.

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

CAPACITY to UNDERSTAND the mathematical theories and USE them in solving an engineering problem.

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

Differentiation and integration, Multiple integrals, Numerical integration, Ordinary differential equations, Approximate solution of ODE, Least squares regression.

Reading List**Compulsory Readings**

Title	
1	Robert T. Smith, Roland B. Minton, Calculus, 4th Edition, New York : McGraw-Hill c2012.
2	Erwin Kreyszig, Advanced Engineering Mathematics, Seventh Edition, John Wiley & Sons, Inc. 1993.
3	C.R. Wylie, L.C. Barrett, Advanced Engineering Mathematics, Sixth Edition, McGraw-Hill 1995.

Additional Readings

Title	
1	Michael D. Greenberg, Advanced Engineering Mathematics. (2th edition). Prentice-Hall International, Inc. New Jersey. 1998.
2	Dean G. Duffy, Advanced engineering mathematics. Boca Raton, Fla. : CRC Press, 1998.
3	Erwin Kreyszig, Advanced engineering mathematics. (8th edition). New York : John Wiley, 1999.
4	Alan Jeffrey. Advanced engineering mathematics. San Diego : Harcourt Academic Press, 2002.
5	Ward Cheney, David Kincaid, Numerical Mathematics and Computing.(3rd edition). Pacific Grove, Calif.: Brooks/Cole Pub. Co., 1994.
6	Saturnino L. Salas, Calculus : one and several variables. (9th edition). New York : J. Wiley & Sons, 2003.
7	Vithala A. Patel, Numerical Analysis. Ft. Worth : Saunders College Pub., 1994.
8	Online Resources: Official course website at the Blackboard System of CityU.