

CA19504: INTRODUCTION TO BUILDING TECHNOLOGY

Effective Term

Semester A 2022/23

Part I Course Overview

Course Title

Introduction to Building Technology

Subject Code

CA - Civil and Architectural Engineering

Course Number

19504

Academic Unit

Architecture and Civil Engineering (CA)

College/School

College of Engineering (EG)

Course Duration

One Semester

Credit Units

3

Level

A1, A2 - Associate Degree

Medium of Instruction

English

Medium of Assessment

English

Prerequisites

Nil

Precursors

Nil

Equivalent Courses

Nil

Exclusive Courses

Nil

Part II Course Details

Abstract

This course aims to provide students with scientific knowledge of the physical and subjective factors that affect human comfort relating to heat, light, sound and air quality in the built environment and an understanding of the relationship between users, building performances and the living environment, and the principles and knowledge of the design and construction of low-rise buildings.

Course Intended Learning Outcomes (CILOs)

CILOs		Weighting (if DEC-A1 DEC-A2 DEC-A3 app.)			
1	Explain the concepts of heat, light and sound in relation to designs in architecture and the built environment.		x		
2	Explain the concepts of air quality and natural ventilation in relation to designs in architecture and the built environment.		x		
3	Evaluate simple structural systems to fulfil the requirements of a low-rise building.			x	
4	Evaluate basic building components and materials to fulfil the requirements of a low-rise building.			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	Oral presentations to present information on a particular subject. Other forms of teaching and learning activities may also be incorporated to encourage participation during a lecture.	1, 2, 3, 4	2 hrs / wk

2	Tutorial	An activity complementary to the lecture classes to provide more opportunities for student-instructor and student-student interaction. You will be engaged in more detailed discussions on the lecture materials and/or assessment tasks in a tutorial.	1, 2, 3, 4	1 hr / wk
---	----------	---	------------	-----------

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Assignments	1, 2	25	
2	Group Project	3, 4	25	

Continuous Assessment (%)

50

Examination (%)

50

Examination Duration (Hours)

1.5

Additional Information for ATs

Students must attain a minimum mark of 30 in all assessment components AND an overall mark of 40 to pass the course.

Assessment Rubrics (AR)**Assessment Task**

Assignments

Criterion

1.1 Demonstrate understanding of the scientific principles of heat, light, and sound relating to architecture and the built environment. Identify and explain principles applied for solving architectural and built environment problems.1.2 Demonstrate understanding of the scientific principles of air quality and natural ventilation relating to architecture and the built environment. Identify and explain principles applied for solving architectural and built environment 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 level

Assessment Task

Group Project

Criterion

2.1 Demonstrate understanding of the requirements of simple structural systems for the built environment, and the ability to apply the principles and knowledge to the design of low-rise buildings. Be able to present all ideas in a logical order and communicate effectively and persuasively via written texts and/or oral presentation. 2.2 Demonstrate understanding of the requirements of basic building components and materials for the built environment, and the ability to apply the principles and knowledge to the design of low-rise buildings. Be able to present all ideas in a logical order and communicate effectively and persuasively via written texts and/or oral presentation.

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

Assessment Task

Examination

Criterion

3.1 Demonstrate the ability to explain the concepts of heat, light and sound, air quality and natural ventilation, simple structural systems to fulfil the requirements of a low-rise building, and the basic building components and materials to fulfil the requirements of a low-rise building in relation to designs in architecture and the built environment.

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

Fundamentals of heat transfer; thermal comfort indices and charts; solar radiation; overall thermal transfer value; energy-efficient building envelope design; urban heat island effect; photometry; basic illumination concept; visual comfort and performance; daylighting, artificial and natural lighting design for buildings; characteristics and strength of sound; noise criteria; sound transmission and sound insulation; sound measurement; outdoor air quality and indoor air quality (IAQ); purposes and principle of natural ventilation; building design for natural ventilation; factors influencing air quality; measurement and management of IAQ in offices and public places; user requirements for a built environment; introduction to planning and building control systems; building envelope; form of structure for low-rise building; in-situ reinforced concrete floor; functional requirements of walls; brick, block and concrete walls; structure and roof coverings; construction of reinforced concrete stairs and steel stairs; doors, building materials; windows; common wet trades: floor, wall and ceiling finishes.

Reading List

Compulsory Readings

Title	
1	Appleby P (2011), Integrated sustainable design of buildings, Earthscan.
2	Chudley, R. (1999) Construction Technology, 3rd Edition, Harlow, Essex: Longman.
3	Dean, Y. (1996) Finishes, 4th Edition, Essex, UK: Longman.
4	Fanger, P.O. (1972). Thermal Comfort Analysis and Applications in Environmental Engineering. McGraw Hill Book Co.
5	Foster, J. S. & Harington, R. (2007) Structure and Fabric, 7th Edition, London: Longman.
6	Kaufmann, R. K. and C. J. Cleveland (2008). Environmental science. McGraw-Hill Higher Education.
7	McMullan, R. (2002). Environmental Science in Building. Macmillan Distribution Ltd.
8	Pelton, H. K. (1992). Noise control management. New York: Van Nostrand Reinhold.
9	Santamouris, M. (ed.) (2013). Energy and climate in the urban built environment. London: James & James.
10	Seeley, I. H. (1995) Building Technology, 5th Edition, Houndmills, Basingstoke, Hampshire: Macmillian.

Additional Readings

Title	
1	Nil