

CA3691: BUILDING SERVICES FOR BUILDING PROFESSIONALS

Effective Term

Semester B 2024/25

Part I Course Overview

Course Title

Building Services for Building Professionals

Subject Code

CA - Civil and Architectural Engineering

Course Number

3691

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

Nil

Exclusive Courses

Nil

Part II Course Details

Abstract

Knowledge of building services is crucial for all building professions as various building services systems profoundly impact occupants' comfort, functionality, efficiency, and safety. This course aims to equip students with comprehensive knowledge of major building services systems in Hong Kong, including heating, ventilation & air-conditioning (HVAC), fire services, plumbing & drainage, electrical installations, etc. Through this course, students will explore the construction, function, installation, and operation of these systems. The students will gain insights into the components, equipment and materials comprising the systems, enabling them to evaluate their effects on buildings and assess the energy implications. Moreover, the course emphasizes the interpretation of statutory regulations governing building services installations in Hong Kong, ensuring students become well-versed in compliance with the legal requirements. This course provides a pivotal platform for aspiring building professionals, empowering them to contribute effectively to creating safe, sustainable, and well-functioning built environments for building occupants.

Course Intended Learning Outcomes (CILOs)

CILOs		Weighting (if DEC-A1 app.)		DEC-A2	DEC-A3
1	Explain the function, operation and installation of building services systems;		x	x	
2	Describe the equipment, components and materials that comprise the systems;		x	x	
3	Evaluate the effects of the systems upon the building and vice-versa; including selection and implications on energy; and			x	x
4	Explain the statutory regulations applicable to building services installations in Hong Kong.		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	Lectures	Students will engage in formal lectures to gain knowledge about building services.	1, 2, 3, 4	
2	Tutorials	Students will engage in discussions on problems related to lecture themes.	1, 2, 3, 4	

Assessment Tasks / Activities (ATs)

ATs		CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Mid-term Test	1, 2, 3, 4	20	
2	Individual Assignment (2 nos.)	1, 2, 3	20	
3	Group Assignment	1, 2, 3, 4	10	

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**

Mid-term Test

Criterion

ABILITY to EXPLAIN knowledge relating to the topics of building services, including but not limited to HVAC, fire service, plumbing & drainage, electrical installation, etc.

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

Individual Arrangement

Criterion

CAPACITY to EXPLORE, INVESTIGATE, and ORGANIZE knowledge and ideas in an independent fashion in topics pertaining to building services. The topics include but not limited to HVAC, fire service, plumbing & drainage, electrical installation, etc.

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

Group Assignment

Criterion

CAPACITY to EXPLORE, INVESTIGATE, and ORGANIZE knowledge and ideas in an independent fashion in topics pertaining to building services. The topics include but not limited to HVAC, fire service, plumbing & drainage, electrical installation, etc.

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 EXPLAIN and DISCUSS knowledge relating to the topics of building services, including but not limited to HVAC, fire service, plumbing & drainage, electrical installation, etc.

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

Cold water systems; Hot water systems; Soil Waste and Vent; Gas supply; Electrical power supply system and distribution, HVAC system, Refrigeration system, Fire Services, Lift and escalator.

Reading List**Compulsory Readings**

Title	
1	Nil

Additional Readings

Title	
1	ASHRAE, 2005. ASHRAE Handbook: Fundamental, American Society of Heating Refrigeration & Air-conditioning Engineers, Latest Edition, Atlanta, GA.
2	ASHRAE, 2004. ASHRAE Handbook: HVAC systems and equipment, American Society of Heating Refrigeration & Air-conditioning Engineers, Latest Edition, Atlanta, GA.
3	Oughton, D.R. and Hodgkinson, S., 2002. Faber and Kell's heating and air conditioning of buildings, 9th edition, Oxford : Butterworth-Heinemann.
4	Seip, G.G., 2000. Electrical installations handbook, 3rd edition, Erlangen : Publicic MCD ; Chichester : Wiley.
5	Hall, F., 1987. Building services and equipment, 2nd edition, London : Longman.
6	IEE, 1992. Requirements for electrical installations : IEE wiring regulations, 16th edition, London : The Institution of Electrical Engineers.
7	So, A.P.T. and Chan, W.L., 1999. Intelligent building systems, Boston, Mass. : Kluwer Academic.
8	Stein, B. and Reynolds, J.S., 2000. Mechanical and electrical equipment for buildings, 9th edition, New York : Wiley.
9	FSD, 1998. Codes of practice for minimum fire services installations and equipment and inspection, testing and maintenance of installations and equipment, 10th edition, Fire Services Department, HKSAR.
10	BA, 1996. Code of Practice for The Provision of Means of Escape in Case of Fire, Building Authority, HKSAR.
11	BA, 1995. Code of Practice for The Provision of Means of Access for Firefighting and Rescue Purposes, Building Authority, HKSAR.
12	Department of Justice. The Laws of Hong Kong - CAP 95, 102, 103 & 123, Department of Justice, HKSAR.