City University of Hong Kong
Course Syllabus

offered Division of Building Science & Technology
with effect from Semester A 2018/19

Part I Course Overview

Course Title:	Electrical Services 1
Course Code:	BST22551
Course Duration:	1 semester
Credit Units:	3 credits
Level:	A2
Proposed Area: *(for GE courses only)*	☐ Arts and Humanities ☐ Study of Societies, Social and Business Organisations ☐ Science and Technology
Medium of Instruction:	English
Medium of Assessment:	English
Prerequisites: *(Course Code and Title)*	NIL
Precursors: *(Course Code and Title)*	BST12513 Building Electrical Science
Equivalent Courses: *(Course Code and Title)*	NIL
Exclusive Courses: *(Course Code and Title)*	NIL

Part II Course Details

1. Abstract

(A 150-word description about the course)

This course aims to enable students to understand the operating principles of major electrical equipment and to design a safe, reliable and energy efficient building electrical power distribution system. Through a range of guided learning experiences, students will ultimately be able to grasp necessary techniques to identify user requirements, to select major electrical distribution equipment, and to apply relevant codes of practices and international standards in the design of a building electrical distribution system.

2. Course Intended Learning Outcomes (CILOs)

(CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)

No.	CILOs	Weighting* (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	*A2*	*A3*
1.	identify characteristics of and user requirements for electricity services	15%	√		
2.	identify factors for the selection and erection of major electrical distribution equipment	15%	√		
3.	explain local electricity ordinance and codes of practice, and international standards governing building electrical power distribution systems.	30%		√	
4.	to design and operate a reliable, safe and energy efficient building electrical wiring system	40%		√	
		100%			

** If weighting is assigned to CILOs, they should add up to 100%.*

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 self-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.

3. Teaching and Learning Activities (TLAs)

(TLAs designed to facilitate students' achievement of the CILOs.)

TLA	Brief Description	CILO No.				Hours/week (if applicable)
		1	2	3	4	
Lecture (Average class size: around 100 students)	An in-class activity in groups involving oral presentation by lecturers and discussion with students on a selected topic through illustrating exercises, real-life examples and question generation by the students and answering by peers or by the lecturers	√	√	√	√	2 hrs/wk

Tutorial (Average class size: not more than 30 students)	A combination of case problems and/or calculation exercises for guided students learning		√	√	√	1 hr/week

4. Assessment Tasks/Activities (ATs)

(ATs are designed to assess how well the students achieve the CILOs.)

Assessment Tasks/Activities	CILO No.				Weighting*	Remarks
	1	2	3	4		
Continuous Assessment: 40 %						
Study report			√	√	20%	A student must obtain a minimum mark of 35 in both coursework and examination and an overall mark of 40 to pass the course
Test	√	√	√	√	20%	
Examination	√	√	√	√	60%	
Examination: 60 % (duration: 2.5 hours)						
** The weightings should add up to 100%.*					100%	

5. Assessment Rubrics

(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
1. Study report	(1.1) Capacity for self-directed learning to understand power harmonics and its effects on the safe and energy efficient operation of electrical distribution systems	High	Significant	Moderate	Basic	Not even reaching marginal levels
	(1.2) Capacity for self-directed learning on conducting literature survey, and organizing concepts and solutions in an systematic and presentable format	High	Significant	Moderate	Basic	Not even reaching marginal levels
2. Test	Capacity to understand and describe basic electrical distribution systems design and operation issues	High	Significant	Moderate	Basic	Not even reaching marginal levels
3. Examination	Capacity to select appropriate electrical distribution systems and equipment characteristics for safe, reliable and energy efficient operations	High	Significant	Moderate	Basic	Not even reaching marginal levels

Part III Other Information (more details can be provided separately in the teaching plan)

1. Keyword Syllabus

(An indication of the key topics of the course.)

(a) Utilization of electricity: electricity generation and distribution in Hong Kong; tariff structure; load demand and diversity; power factor correction.
(b) Protection against fault and electric shock: earthing systems, protection against direct and indirect contact; earth fault and overcurrent protection.
(c) Circuit protection: principles and operations of circuit breakers and fusing.
(d) Electrical wiring systems: cable types and characteristics; cable and circuit arrangement.
(e) Power quality and harmonics: causes and effects; mitigation measures.

2. Reading List

2.1 Compulsory Readings

(Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)

1.	EMSD (latest edition). *Code of practice for the electricity (wiring) regulations latest edition.* Electrical and Mechanical Services Dept, HKSAR Government
2.	EMSD (latest edition). *Code of practice for energy efficiency of building services installation, latest edition.* Electrical and Mechanical Services Dept, HKSAR Government

2.2 Additional Readings

(Additional references for students to learn to expand their knowledge about the subject.)

1.	Santoso, S., Beaty, H. W., Dugan, R. C. and McGranaghan, M. F. (2002). *Electrical Power Systems Quality*. 2nd ed. New York: McGraw-Hill
2.	*BS7671, IEE Wiring Regulations, 17th Edition and subsequent amendments*, Institution of Electrical Engineering and Technology, UK
3.	FSD (latest edition) *Codes of Practice for Minimum Fire Service Installations and Equipment and Inspection, Testing and Maintenance of Installations and Equipment*, Fire Services Dept., HKSAR Government
4.	Supply Rules (latest edition). CLP Power Hong Kong Ltd.
5.	Supply Rules (latest edition). The Hongkong Electric Co., Ltd.
6.	Matthews, J. (latest edition). *Introduction to the Design and Analysis of Building Electrical Systems*. Springer
7.	Stokes, G. (latest edition). *A Practical Guide to the Wiring Regulations*. Wiley-Blackwell
8.	Stokes, G. (latest edition). *Handbook of Electrical Installation Practice*. Wiley-Blackwell
9.	Online resource: Technical publications from Schneider Electric http://www.schneider-electric.com/sites/corporate/en/products-services/technical-publications/technical-publications.page