

City University of Hong Kong
Course Syllabus

offered by Department of Electrical Engineering
with effect from Semester A in 2021/2022

Part I Course Overview

Course Title: Principles of Electrical Engineering

Course Code: EE1002

Course Duration: One Semester (13 weeks)

Credit Units: 3

Level: B1
Proposed Area: Arts and Humanities
(for GE courses only) Study of Societies, Social and Business Organisations
 Science and Technology

Medium of Instruction: English

Medium of Assessment: English

Prerequisites: Nil
(Course Code and Title)

Precursors: Nil
(Course Code and Title)

Equivalent Courses: Nil
(Course Code and Title)

Exclusive Courses: Nil
(Course Code and Title)

Part II Course Details

1. Abstract

This course is aimed at providing students with an understanding of the concepts, impacts, and basic principles of electronic engineering.

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.	Consolidate mathematical concepts on differentiation, integration, trigonometry and complex numbers		✓	✓	
2.	Describe the basic principles of electric charges and electrical conduction		✓	✓	
3.	Apply Kirchhoff's laws to analyze DC circuits		✓	✓	
4.	Apply complex impedance concept to analyze simple AC circuits with capacitors and inductors		✓	✓	
		100%			

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

[#] Please specify the alignment of CILOs to the Gateway Education Programme Intended Learning outcomes (PILOs) in Section A of Annex.

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 and Tutorials	Lectures on various fundamental knowledge and concepts in the field of electronic engineering.	✓	✓	✓	✓			3 hrs/wk (2 hrs Lect, 1 hr Tut)
Tests	To test the students' understanding on the lecture materials.	✓	✓	✓	✓			
Labs / Practice Classes	Conduct experiments and class exercises to deepen key concepts covered in lectures and tutorials			✓	✓			2hrs/wk (4 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: <u>50%</u>								
Tests (min.: 2)	√	√	√	√			30%	
#Assignments (min.: 3)	√	√	√	√			10%	
Lab exercises and reports			√	√			10%	
Examination: <u>50%</u> (duration: 2hrs , if applicable)								
Examination	√	√	√	√			50%	

* The weightings should add up to 100%.

100%

Remark:

To pass the course, students are required to achieve at least 30% in coursework and 30% in the examination. Also, 75% laboratory attendance rate must be obtained.

may include homework, tutorial exercise, project/mini-project, presentation

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. Examination	Achievements in CILOs	High	Significant	Moderate	Basic	Not even reaching marginal levels
2. Coursework	Achievements in CILOs	High	Significant	Moderate	Basic	Not even reaching marginal levels

6. Constructive Alignment with Major Outcomes

Please state how the course contribute to the specific MILO(s)

MILO	How the course contribute to the specific MILO(s)
1,5	Through lectures and tutorials, students acquire fundamental knowledge on a range of topics in electronic engineering. Through continuous assessment, they are given opportunities to apply the acquired knowledge to solving simple engineering problems.
7	Students are given opportunities to present and explain their solutions in tutorials, which can help develop their communication skills.
8,9	Through lectures, students learn about some most advanced developments in the subject and their impact on the society. They are also encouraged to further their studies by self-learning.

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

1. Keyword Syllabus

Mathematical Foundations for Circuit Analysis

Introduction to differentiation, derivative, gradient, rate of change; introduction to integration, integral, area; fundamentals to differential equations; trigonometry; complex numbers (rectangular form and phasor form)

Review of Electrical Conduction

Atomic structure and electric charge, conductors, insulators, electric field and magnetic field, electric current, resistance, potential

DC Circuit analysis

Ohm's law, Kirchhoff's law, power and energy; resistor, sources, open- and short- circuit; series and parallel networks; ammeter, voltmeter; mesh and nodal analysis, Thevenin's and Norton's theorems; maximum power transfer

AC Circuit Analysis

Capacitor and inductor; first-order transient circuit (RL and RC circuits); complex impedance; sinusoids;; instantaneous and average power;

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.	M. O. Sadiku, S. M. Musa and C. K. Alexander, "Applied Circuit Analysis," McGraw Hill, 2012.
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2.2 Additional Readings

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

1.	N. Storey, "Electronics: A System Approach," Pearson, 5th edition, 2013.
2.	A. R. Hambley, "Electrical Engineering: Principles and Applications," Pearson, 6th edition, 2013.
3.	J. N. Burghartz, "Guide to State-of-the-Art Electron Devices", Wiley and IEEE Press, 2013.