The Hong Kong University of Science and Technology

UG Course Syllabus

Electronic Circuits

ELEC 2400

4 Credits

Pre-requisites: ELEC 1100 AND (MATH 1003 OR MATH 1014 OR MATH 1020 OR MATH 1024)
Co-requisite: PHYS 1114 OR PHYS 1314.
Exclusion: ELEC 2420.

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Office Hours: Weekly office hours or by appointments

Course Description

Fundamental electronic concepts for DC and AC circuits, KVL and KCL, Thevenin's and Norton's theorems, linearity and superposition, nodal and mesh analyses, sinusoidal steady state and phasor representation, frequency response, transfer functions and Bode plots, op amps, first-order transient analysis, and diode circuits.

Intended Learning Outcomes (ILOs)

By the end of this course, students should be able to:

ILO1. Apply the fundamental circuit concepts to compute the output of basic electronic circuits in response to a DC input signal.

ILO 2. Recognize sinusoidal steady state characteristics of basic electronic circuits using phasors and compute the output of basic electronic circuits in response to an AC input.

ILO 3. Compute the transient responses of basic electronic circuits consisting of capacitors and inductors.

ILO 4. Compute the characteristics of basic electronic circuits consisting of operational amplifiers and diodes.

ILO 5. Employ electronic instruments and perform experiments.

ILO 6. Apply CAD tools to simulate and analyze electronic circuits.

Assessment and Grading

This course will be assessed using criterion-referencing and grades will not be assigned using a curve. Detailed rubrics for each assignment are provided below, outlining the criteria used for evaluation.

Assessments:

Assessment Task	Contribution to Overall Course Grade (%)	Due Date
Lab	20%	Week 3 to Week 13
Homework	10%	Week 4 to Week 13
Mid-Term Examination	25%	Week 8
Final Examination	45%	After Week 13

Mapping of Course ILOs to Assessment Tasks

Assessed Task	Mapped ILOs	Explanation
Mid-Term and Final Examinations	ILO1, ILO2, ILO3, and ILO4	This task assesses students' ability to understand and analyze electronic circuits.
Homework	ILO1, ILO2, ILO3, and ILO4	This task assesses students' ability to understand and analyze electronic circuits.
Lab	ILO5, and ILO6	This task assesses students' ability to (1) employ instruments to conduct experiments and build electronic circuits, and (2) apply CAD tools to simulate, analyze, and design electronic circuits.

Grading Rubrics

Homework and examinations will be graded based on the accuracy of the answers, the correctness of calculations, and the logical progression of steps, with the goal of accurately reflecting the students' understanding of the subject matter. Lab assignments will be graded on the completion and successful demonstration of tasks during lab sessions.

Final Grade Descriptors

Grades	Short Description	Elaboration on subject grading description
A	Excellent Performance	Demonstrates a thorough understanding of electronic concepts, comprehensive proficiency in solving circuit problems, and exceptional hands-on skills in analyzing, designing, and building practical electronic circuits.
B	Good Performance	Demonstrates a good understanding of electronic concepts, competence in solving circuit problems, and good hands-on skills in analyzing, designing, and building practical electronic circuits.
C	Satisfactory Performance	Demonstrates adequate understanding of basic electronic concepts, capacity in solving familiar circuit problems, and acceptable hands-on skills in analyzing, designing, and building practical electronic circuits.

D	Marginal Pass	Demonstrates threshold understanding of basic electronic concepts, limited capacity in solving familiar circuit problems, and inconsistent hands-on skills in analyzing, designing, and building practical electronic circuits.
F	Fail	Demonstrates insufficient understanding of basic electronic concepts, lacks the required skills to solve familiar circuit problems, and shows inadequate hands-on skills in analyzing, designing, and building practical electronic circuits. This may be further compounded by missing homework or lab submissions, or absence from examinations.

Communication and Feedback

Marks for individual assessment tasks will be posted on Canvas within two weeks of submission. Detailed feedback on assignments will be provided upon reasonable request. Students with further questions about the feedback or marks should consult the teaching associate or instructor.

Resubmission Policy

Late homework submissions will not be accepted. However, homework may be resubmitted before the due date, and only the most recent submission will be graded in the case of multiple submissions.

Required Texts and Materials

No required textbook.

Reference Book:
D. V. Kerns and J. D. Irwin, *Essentials of Electrical and Computer Engineering*, Pearson, 2004.

Course AI Policy

The use of Generative AI is permitted.

Academic Integrity

Students are expected to adhere to the university's academic integrity policy. Students are expected to uphold HKUST's Academic Honor Code and to maintain the highest standards of academic integrity. The University has zero tolerance of academic misconduct. Please refer to Academic Integrity | HKUST – Academic Registry for the University's definition of plagiarism and ways to avoid cheating and plagiarism.