Course Specification
Electronic and Electrical Engineering
School of Science and Technology, Sunway University, Malaysia

Section 1: Course Summary

Course Name	Analogue Electronics Fundamentals
Course Code	ETC1023
Lecturer(s)	Dr. Richard Wong
Category	Core
Semester/Year Offered	Semester 3 / Year 1
SLT Credit Hours	3
Pre-requisite (if any)	
Synopsis	The course introduces the fundamental solid-state electronics including diodes, BJTs, FETs, and amplifiers. The course focuses on the understanding of the operations of the discrete components and their applications in the analogue circuits.
Transferable Skills	Analytical Skills, Problem-Solving and Scientific Skills
Delivery Method	Lectures, Tutorials, and Laboratory Practices

Section 2: Course Outcomes

Mapping of the Course Outcomes (CO) to Programme Outcomes (PO), Knowledge Profile (WK), Complex Problem Solving (WP), and Complex Engineering Activities (EA).

At the end of this course, the student will be able to:

Course Outcome (CO)	
CO1	**Describe** the I-V characteristics and linear operations of discrete components.
CO2	**Analyze** the operations of rectifier circuits.
CO3	**Analyze** the linear operations of amplifier circuits.
CO4	**Design** analogue circuits according to a given design specification.

Note: LD/BT = Learning Domain/Bloom's Taxonomy

Mapping of the Course Outcomes (CO) to Programme Outcomes (PO), and Programme Educational Objectives (PEO). Relational Indicator is "X".

CO	PO												PEO		
	1	2	3	4	5	6	7	8	9	10	11	12	PEO1	PEO2	PEO3
CO1	X												X		
CO2		X											X		
CO3		X											X		
CO4			X										X		

Section 3: Teaching-Learning Assessment Strategy

Mapping of the Assessment Components and Assessment Methods to the Course Outcomes (CO). Relational Indicator is "X".

Assessment Components	Assessment Methods	Weightage (%)	CO1	CO2	CO3	CO4
Written Assessment	Test(s)	10		X	X	
	Final Examination	60	X	X	X	X
Assignment	Assignment(s)	20				X

Laboratory (Graded)	Open-ended Experiment 1	5		X		
	Open-ended Experiment 2	5			X	

Mapping of the Teaching-Learning Activities and Assessment components to the Programme Outcomes (PO).

Programme Outcomes (PO)	Teaching-Learning Activities	Assessment Components
PO1	Lectures, Tutorials, Laboratory Practices	Final Examination
PO2	Lectures, Tutorials, Laboratory Practices	Test, Final Examination, Open-ended Experiment
PO3	Lectures, Tutorials, Laboratory Practices	Assignment, Final Examination

Section 4: Teaching Plan and Student Learning Time (SLT)

Summary of total Student Learning Time (SLT).

SLT Components: L = Lecture T = Tutorial P = Practical A = Assessment O = Others	Face to Face					Independent Learning
	L	T	P	A	O	IL
	28	14	14	3		61
Total SLT Hours	120					
SLT Credit Hours	3					

Teaching Plan and Student Learning Time (SLT).

Teaching-Learning Plan: Course Topic and Outline	Student Learning Time (SLT)						Topic SLT
	L	T	P	A	O	IL	
Semiconductor for Electronics • Introduction semiconductor materials • P-N junction concepts • P-N junction bias • P-N junction electrical characteristics • P-N junction applications	2	1	1			2	6
Diodes • Ideal diodes • Practical diodes • Diode characteristics • Schottky diodes • Zener diodes	4	2	2			4	12
Rectifiers • Half-wave rectifier • Full-wave rectifier • Bridge rectifier • Rectifier with smoothing filter	6	3	3			6	18
Bipolar junction transistors • Basic operation • Small-signal model • Large-signal model	6	3	3			6	18
Field effect transistors • Basic operation • MOSFETs	4	2	2			4	12

• DMOSFETs							
Amplifiers • Amplifier configurations • Gain analysis • Transistor amplifiers • Differential amplifiers • Comparators • Switching circuits	6	3	3			6	18
Laboratory (2 Graded Reports with 1000 words each)						10	10
Assignment (2000 words)						10	10
Test				1		3	4
Final Examination				2		10	12
Sub-total for each SLT components	28	14	14	3		61	120
Total SLT Hours (15 Weeks)	120						
SLT Credit Hours	3						

References:

Main Reference	Karl D. Stephan, Analog and Mixed-Signal Electronics, 1st Edition, 2015, John Wiley & Sons
Additional References	Charles Schuler, Electronics: Principles and Applications, 9th Edition, 2018, McGraw-Hill Education Adel S. Sedra, Kenneth C. Smith, Tony Chan Carusone, and Vincent Gaudet, Microelectronic Circuits, 8th Edition, 2019, Oxford University Press Inc Allan R. Hambley, Electrical Engineering: Principles & Applications, 7th edition, 2017, Pearson