



Electrical and Renewable Energy Engineering Program

Course Specification - (2025-2026)

Electronic Devices – CCE122

Academic Year	2025/2026	Semester	Spring
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1. Basic Information

Course Title (according to the bylaw)	Electronic Devices				
Course Code (according to the bylaw)	CCE122				
Prerequisite:	Electrical Circuits (1) - CCE111				
Department/s participating in delivery of the course	Electrical and Renewable Energy Engineering				
Number of credit hours/points of the course (according to the bylaw)	Credit Hours	Contact Hours			
		Lecture	Tutorial	Practical	Total
	3	2	1	2	5
Course Type	Compulsory - Major Requirements of Electrical and Renewable Energy Engineering				
Academic level at which the course is taught	Second Level				
Academic Program	Bachelor of Engineering of Electrical and Renewable Energy				
Faculty/Institute	Faculty of Engineering				
University/Academy	Nahda University				
Name of Course Coordinator	Dr. Maha Gaber Ahmed Mahmoud				
Course Specification Approval:	Department council		Faculty council		
Date of Approval of the course Specification:	13 / 9 / 2025		16 / 9 / 2025		



2. Course Overview

PN junction diodes, special diodes, diode circuits applications, rectifiers and peak detectors - Bipolar junction transistors (BJT), dc models, modes of operation, bias and stabilization, graphical analysis, small signal ac models - Junction field effect transistors (JFETs). Metal oxide semiconductor field effect transistors (MOSFETs), dc models, modes of operation, bias and stabilization, small signal ac models, amplifier configurations. Logic circuits: BJT logic families, construction, properties, speed and applications.

3. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
A10	Acquire and apply new knowledge, and practice self- and lifelong and other learning strategies.	CLO1	Describe the operation of basic semiconductor devices in words, by mathematical equations, and by models.
		CLO4	Collect and analyze experimental data that are used to investigate physical phenomena. and electronic device characteristics.
B2	Design, model, and analyze an electrical/electronic/digital system or component for a specific application; and identify the tools required to optimize this design.	CLO1	Describe the operation of basic semiconductor devices in words, by mathematical equations, and by models.
		CLO4	Collect and analyze experimental data that are used to investigate physical phenomena. and electronic device characteristics.
B4	Estimate and measure the performance of an electrical/electronic/digital system and the circuit under specific input excitation and evaluate its suitability for a specific application.	CLO2	Determine the electrical characteristics of the device and apply them for electronic circuit analysis.
		CLO3	Recall the basic electronic device structure and operation.
		CLO5	Demonstrate the validity of principles through the comparison of the experimental results to the mathematical/theoretical description.



4. Teaching and Learning Methods

1. Interactive Lectures
2. Self-Learning
3. Experimental Learning
4. Research and Reports
5. Problem Solving
6. Tutorials
7. Cooperative education
8. Projects

Course Schedule

Number of the Week	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours				
			Lecture Hours	Tutorial Hours	Practical Hours	Self-learning (Ass/ Project)	Other
1	Lecture: Introduction: LAB: Circuit Connection Revision (using the instrument in measuring with connected resistive elements)	7	2	1	2	2	-
2	Lecture: What are electronic devices? LAB: circuit theories (mesh and nodal)	7	2	1	2	2	-
3	Lecture: Semiconductors LAB: characteristics of PN junction	7	2	1	2	2	-
4	Lecture: PN Junction Diodes LAB: characteristics of PN junction	7	2	1	2	2	-
5	Lecture: Diode Element Circuit LAB: Diode circuits	9	2	1	2	2	Quiz 1 (2 Hr)
6	Lecture: Diode Applications (half and full wave rectifier). LAB: applied Diodes Applications	7	2	1	2	2	-
7	Lecture: Diodes Applications (clipper and clamper) LAB: applied Diodes Applications	7	2	1	2	2	-
8	Lecture: Zener Diode and its application LAB: applied Zener Applications	7	2	1	2	2	-
9	Lecture: BJT transistor LAB: applied BJT analysis	7	2	1	2	2	-
10	Lecture: BJT transistor DC analysis	9	2	1	2	2	Quiz 2



	LAB: applied DC BJT analysis						(2 Hr)
11	Lecture: BJT transistor AC LAB: applied AC BJT analysis	7	2	1	2	2	-
12	Lecture: FET transistor DC analysis LAB: applied DC FET analysis	7	2	1	2	2	-
13	Lecture: FET transistor AC analysis LAB: applied AC FET analysis	7	2	1	2	2	
14	Lecture: MOS transistor AC and DC analysis LAB: applied DC MOS and AC analysis	7	2	1	2	2	-
15	Revision	7	2	1	2	2	-
16	Final Term Exam						

5. Methods of students' assessment

No.	Method of assessment	Assessment Timing (Week Number)	Marks	Percentage of total course Marks
1	Quiz (1)	Week 6	10	10 %
2	Quiz (2)	Week 13	10	10 %
3	Midterm exam	Week 7	20	20 %
4	Final Practical Exam	Week 15	5	5 %
5	Final Oral Exam	Week 15	5	5 %
6	Final written exam	Week 17	40	40 %
7	Projects/ Assignments/...	-	5	5%
8	Research and Reports	During the semester	5	5%

6. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.)	The main (essential) reference for the course	- Floyd, Thomas L, Electronic devices. 2012 - Shuqin Lou, Chunling Yang Digital Electronic Circuits.
	Other References	R. L. & Nashelsky L., Electronic Devices and Circuit Theory, 11th Edition, Pearson Prentice Hall, 2007
	Electronic Sources	www.ekb.eg
	Learning Platforms	https://lms.nub.edu.eg/login/index.php



	Other (to be mentioned)	Microelectronic circuits (sixth edition) Adel S. Sedra (University of Waterloo), Kenneth Smith (University of Toronto).
Supportive facilities & equipment for teaching and learning	Devices/Instruments	Data Show System
	Supplies	White Board
	Electronic Programs	MATLAB - PSPICE
	Skill Labs/ Simulators	Lab Facilities
	Virtual Labs	-
	Other (to be mentioned):	Library

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Course Coordinator

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