

120 CNE Course Syllabus

Course Code	120 CNE
Course Name	Electronic Devices and Circuits
Credit Hours	3
Contact Hours	4
Instructor Name	Dr. Ahmed NEFFATI

Text Book (title, author, and year)

- Electronic Devices and Circuits: Millman and Halkias, 2008.
- Principal of Electronics, V.K. Mehta and Rohit Mehta, 2008.

Specific Course Information

Catalog Description	This course aims to provide the students introduction to diodes and transistors and give the possible applications for them. The basics for operational amplifiers, their analysis and applications are given in this course. Multiport networks and their parameters and applications are covered. Finally different real electronics applications are given as small projects that cover the theory and practical parts.
Prerequisites	Semiconductors, CNE111.
Co-requisites	NIL
Required/Elective	required

Course Learning Outcomes

1	To outline the knowledge of mathematics in determining characteristic of electronic devices and circuits.
2	To predict the behavior and make measurements of simple operational-amplifier circuits.
3	To develop experimental skills for connecting, protecting, and troubleshooting electronic circuits.
4	To analyze the experimental results for choosing the best electronic device for a given electronic application.
5	To summarize the impact of electronic technologies and its necessity for modern electronic applications.
6	To perform calculations for obtaining electronic circuits characteristics using electronic simulation tools.
7	To develop professional skills for using laboratory hardware correctly and safely and interpret the results of laboratory experiments.

Mapping course LOs to the SLO.

Course LOs #	Student Learning Outcomes											
	a1	a2	b1	b2	b3	b4	b5	c1	c2	c3	d1	d2
1	√											
2			√									
3				√								
4				√	√							
5						√						
6							√					
7									√			

List of Theory Topics

Basic Electronics: Electricity, Circuit diagram, Resistors, Capacitors, coil, Diodes principles, connection and Applications.

Transistor: Transistor basics, Transistor types, and Transistor characteristics, Connection mode (switching and amplification modes), Applications.

Operational amplifiers (op-amp): Op-Amp characteristics, Inverting Amplifier Analysis, Non-Inverting Amplifier Analysis, Op-Amp Buffer, Op-Amp Summing Amplifier, Op-Amp differential amplifier, Op-Amp Differentiator, Op-Amp Integrator, oscillator, applications.

Dipoles and quadruples (Multiport Networks). Impedance parameters, Admittance parameters, Hybrid parameters, Transmission parameters, Interconnection of Two Port Networks, Applications.

Functional applications: Gather all chapters and make real applications with different components studied previously.

List of Lab Experiments

1. Introduction to lab Equipment's and Tools
2. Diode Half-wave Rectification
3. Diode Full-wave Rectification
4. Transistor as Switch
5. Current and voltage characteristic of the Transistor
6. Darlington Circuit
7. Darlington Relay switching Circuit
8. Inverting and Summing Operational Amplifier
9. Differential Operational Amplifier
10. Students Demonstration for Electronics Applications.