Faculty of Engineering & Technology

Electronics

Information :

Course Code :	ELE 213	**Level :**	Undergraduate	**Course Hours :**	4.00- Hours
Department :	Department of Electrical Engineering				

Instructor Information :

Title	Name	Office hours
Associate Professor	Waleed Eid Abd Elrahman Alhanafy	1
Associate Professor	Mohamed Hassan Mohamed Elmahlawy	
Lecturer	Muhammad Abdulraouf Mohamed Othman	2
Assistant Lecturer	Mostafa Mohamed Salaheldin Abdelkhalek	4
Assistant Lecturer	Amiraa Sayed Ahmed Abdallah Elhamshary	
Assistant Lecturer	MOHAMED MOUSA SAYED EMAM AHMED	2
Teaching Assistant	Abdelrahman Khaled Abdelrahman Abdelrahman Hamed	2

Area Of Study :

1- A broad coverage of the semiconductors theory.
2- Theory of the P-N junction.
3- Diode Characteristics.
4- Diode models and application circuits.
5- Rectifiers ,voltage doublers , clipping circuits , and clampers.
6- Special diodes : Schottky , Zener , Light Emitting Diodes (LED)
7- Bipolar Junction Transistor (BJT)
8- Transistor circuits : Transistor Amplifiers : Common Emitter (CE) , Common Base (CB) , Common Collector (CC)
9- Field Effect Transistor (JFET) : Characteristics and Circuits.
10- MOSFET, Physical structure , Characteristics and applications.

Course outcomes :

a.Knowledge and Understanding: :

1 -	understand the fundamentals of the semiconductors. To understand the characteristics and applications of the semiconductor devices.
2 -	Solving and analysis of the diode circuits : Rectifiers, Limitters, Clampers, Voltage doublers , and stabilization.
3 -	Solving the Electronic circuits of the (BJT), the (JFET), and the (MOSFET) transistor amplifiers.
4 -	develop the practical skills of testing the electronic components and circuits.

b.Intellectual Skills: :	
1 -	Ability to apply different alternative solutions.
2 -	Ability to apply different solution alternatives using different approximation models : Ideal (First approximation) , Socond approximation , and Third approximation models .
3 -	Analysis of the obtained results both individually or as a part of a team.
c.Professional and Practical Skills: :	
1 -	Testing and measurements of the characteristics of the Diode , and Transistor Components.
2 -	Connections and Measurements of the input and output signal levels and waveforms of the diode rectifying circuits and the transistor amplifier circuits.
3 -	Fault detection and repair of the diode and transistor circuits.
d.General and Transferable Skills: :	
1 -	Ability to write technical reports.
2 -	Ability to work in a self-directed manner.
3 -	Can work coherently as a part of a team.
4 -	Can find innovative solutions

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Characteristics of semiconductor materials. P-N junction.	6	3	3
Diode I-V characteristic. Junction potentials.Diode Models. Lab: measurement of the diode I-V ch.	12	6	6
Half-wave,Full-wave ,Bridge rectifiers.Clippers and Clampers. Lab:LED , Zener ch. MT Exam 1	12	6	6
Special diodes : Zener , LED , and Photodiode circuits. Lab : waveforms of Clippers and Clampers	12	6	6
Bipolar Junction Transistor BJT. BJTcircuits.Transistor amplifiers. CE,CB,CC. Power Amplifiers.	6	3	3
Field Effect Transistor JFET. MOSFET .Basic configurations. I-V ch. Applications. MidTerm Exam 2.	18	9	9
Multistage amplifiers. Small signal models. Biasing. JFET and MOSFET circuits.	12	3	3

Teaching And Learning Methodologies :

Lectures
Tutorials
Laboratories

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
Final Written Exam	40.00	15	to assess the comprehensive understanding of the scientific background of the course, to assess the ability of problem solving.

First Mid-Term Exam	17.50	7	to assess the skills of problem solving, understanding of the course topics.
Laboratory Tutorials	5.00	6	to assess the ability of implementing simple electronic circuits and measure the different characteristics.
Quiz and Assignment	5.00	9	to assess the skills of problem solving, understanding of the course topics.
Quiz and Assignment 1	5.00	5	to assess the skills of problem solving, understanding of the course topics.
Second Mid-Term Exam	17.50	14	to assess the skills of problem solving, understanding of the course topics.

Course Notes :

No course notes are required

Recommended books :

"Electronics Principles", A. Malvino, 7th edition.