

## Faculty of Computers and Information Technology

### Electronics

#### Information :

**Course Code :** EL101

**Level :** Undergraduate

**Course Hours :** 3.00- Hours

**Department :** Faculty of Computers and Information Technology

#### Instructor Information :

Title	Name	Office hours
Lecturer	AMAL SAFWAT MEHANNA .	6
Teaching Assistant	Warda Mustafa Saied Mahmoud	

#### Area Of Study :

Apply the basic characteristics of semiconductor devices in circuit analysis.  
 Combine and evaluate different methods to analyze the electronic circuits.  
 Analyze the requirements of the applications of semiconductor devices, and design a solution for these requirements.  
 Compare and evaluate methodologies from range of techniques to construct, analyze, verify and test analog circuits.  
 Use effectively communication skills.  
 Own the needed knowledge that enhances skills in troubleshooting.

#### Description :

Introduction, Insulators, Conductors, Semiconductors, Resistors, Capacitors, Coils, Diodes, Application of diodes, Rectifiers, Power supplies, LEDs, Voltage regulators, Transistors, Amplifiers, Timers, Applications

#### Course outcomes :

##### **a.Knowledge and Understanding: :**

1 -	Outline the characteristics of semiconductor materials.
2 -	Describe the methodologies to explain the operation of basic semiconductor devices in words, by mathematical equations and by models.
3 -	Discuss the electrical characteristics of the device and apply them for electronic circuit analysis.

##### **b.Intellectual Skills: :**

1 -	Analyze different problems about semiconductor materials characteristics and p-n junction properties.
2 -	Implement a set of alternative solutions for diodes and transistors.
3 -	Test and evaluate the characteristics curves of diodes and transistors.

##### **c.Professional and Practical Skills: :**

1 -	Use different technologies to analyze different forms of electronic circuits.
2 -	Realize the operation of electronic devices such as diode and transistor.
3 -	Acquire a set of fundamental research skills from different resources to implement electronic circuits.

##### **d.General and Transferable Skills: :**

1 -	Work on a team for the development of a requirements document.
2 -	Apply communications skills in presentation and report writing of requirements engineering deliverables.

### **ABET Course outcomes :**

1 -	Apply the basic characteristics of semiconductor devices in circuit analysis.
2 -	Combine and evaluate different methods to analyze the electronic circuits.
3 -	Analyze the requirements of the applications of semiconductor devices and design a solution for these requirements.
4 -	Compare and evaluate methodologies from range of techniques to construct, analyze, verify and test analog circuits.
5 -	Communicate effectively.
6 -	Test and perform appropriate troubleshooting of electronic circuits.

### **Course Topic And Contents :**

Topic	No. of hours	Lecture	Tutorial / Practical
Conductors, Semiconductor and Isolator	4	2	2
Theory of Semiconductor, Atomic Structure	4	2	2
Resistance, Impedance, Basic circuits laws	4	2	2
Series and parallel circuits: Its applications	4	2	2
Kirchhoff's Laws (KVL, KCL)	4	2	2
Capacitors and Capacitance	4	2	2
Inductor and Inductance	4	2	2
Transformer	4	2	2
Mid-Term Exam	2		
p-n Junction, Doping	4	2	2
Diodes: analysis, types, applications	4	2	2
Rectifying circuits: Half wave, full wave, full wave bridge rectifier	4	2	2
Transistors	4	2	2
Final Exam	2		

### **Teaching And Learning Methodologies :**

Interactive Lectures including Discussions
Tutorials
Practical Lab Sessions
Self-Study (Project / Reading Materials / Online Material / Presentations)
Problem Solving

### **Course Assessment :**

Methods of assessment	Relative weight %	Week No	Assess What
Assignments	10.00	4	
Final Exam	40.00	14	
Midterm Exam (s)	20.00	9	
Practical Exam	10.00		

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Quizzes	20.00	5	
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**Course Notes :**

An Electronic form of the Course Notes and all the slides of the Lectures is available on the Students Learning Management System (Moodle)