



Faculty of
Engineering at
Shoubra

Model No.12

Course Specifications : Principles of Electronic Engineering

2014-2015

University : Benha university

Faculty : Faculty of Engineering at Shoubra

Department : Electrical Engineering Department

1- Course Data

Course Code : ECE 111 Course Title : Principles of Electronic Engineering

Study Year : First Year

Specialization : Electronic and Communication Engineering

Teaching Hours:

Lecture : 4 Tutorial : 2 Practical :

2- Course Aim

For students undertaking this course, the aims are to:

- 2.1- Demonstrate how diodes, transistors, and integrated circuits work, by first have to study semiconductors: materials that are neither conductors nor insulators.
- 2.2- Demonstrate how the doping semiconductor is important in fabrication technology. The rectifier importance to most electronic systems within the power supply which allow current to flow in only one direction.
- 2.3- Recognize few of applications for diodes and transistors.

3- Intended Learning Outcomes of Course (ILOS)

a- Knowledge and Understanding

On completing this course, students will be able to:

- a- 1 - Demonstrate Characteristics of engineering materials related to semiconductors.(a4)
- a- 2 - Describe Principles of design including elements design, process and/or a system related to semiconductors. (a5)
- a- 3 - Illustrate electronic engineering principles underlying information technology.(a16)
- a- 4 - Mention basics of design and analyzing of semiconductors.(a18)
- a- 5 - Describe principles of analyzing and design of electronic devices (Diodes ,transistors, and integrated circuits) .(a19)
- a- 6 – Mention Methods of fabrication of Diodes and transistors. (a28)

b- Intellectual Skills

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

- b- 1 -Select appropriate solutions for diodes and transistors problems based on analytical thinking.(b3)
- b- 2 - Combine, exchange, and assess integrated circuits knowledge from a range of sources.(b5)
- b- 3 - Assess and evaluate the characteristics and performance of diodes, transistors, and integrated circuits. (b6)
- b- 4 - Investigate the failure of diodes and transistors. (b7)

c- Professional Skills

On completing this course, the students are expected to be able to:

- c-1 - Professionally merge the engineering knowledge and understanding and feedback to improve design of diodes and transistors.(c2)
- c- 2 - Use computational facilities and techniques, measuring instruments, workshops and laboratories equipment to design diode and transistors circuits. (c5)
- c- 3 - Identify appropriate specifications for diodes an transistors (c18)
- c- 4 - Use appropriate tools to measure the performance of diode and transistor. (c19)

d- General Skills

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

d- 1 - Communicate effectively. (d3)

d- 2 - Search for information and engage in self-learning principles of electronic engineering.(d7)

d- 3 - Acquire entrepreneurial skills (d8)

4- Course Contents

No.	Topics	No. of hours
1	The atomic levels for materials	4
2	The characteristics of conductors, insulators and semiconductors	4
3	The doping in semiconductors	4
4	Conductivity and mobility in semiconductors	4
5	Hall effect theory	4
6	PN junction	4
7	Diode characteristics	4
8	Troubleshooting of diode	4
9	Rectifiers circuits	4
10	Diode application in digital systems	4
11	Bipolar junction transistor	4
12	Troubleshooting of BJT	4

5- Teaching and Learning Methods

5.1- modified Lectures

5.2- Practical training / laboratory

5.3- Class activity

5.4- Case study

5.5- Assignments / homework

6- Teaching and Learning Methods of Disables

6.1- no thing

7- Student Assessment

a- Student Assessment Methods

1	Assignments to assess knowledge and intellectual skills.
2	Quiz to assess knowledge and intellectual skills.
3	Mid-term exam to assess knowledge and intellectual skills.
4	Oral exam to assess knowledge, intellectual skills, professional and general skills.
5	Final exam to assess knowledge and intellectual skills.

b- Assessment Schedule

No.	Assessment	Week
1	Assessment 1 on	1,2,4,6,9,10 and 12
2	Quizzes on	3,7 and 11
3	Mid-term exam on	8
4	Oral Exam on	14
5	Final exam on	15

c- Weighting of Assessments

Assessment	Weight
Mid Term Examination	20 %
Final Term Examination	60 %
Oral Examination	20 %
Practical Examination	0 %
Semester work	0 %
Other types of assessment	0 %



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Total	100 %
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8- List of References

a- Books

1- Integrated Electronics: Analog and Digital circuits and Systems by: Jacob Millman, and Christos C. Halkias, 1972.

b- Recommended Books

1- Electronics Principles by Albert Malvino and David J. Bates, 2007.

9- Matrix of Knowledge and Skills of the course

No.	Topics	week	Basic Knowledge	Intellectual Skills	Professional Skills	General Skills
1	The atomic levels for materials	1	A1	B1		
2	The characteristics of conductors, insulators and semiconductors	2	A1	B2	C1	
3	The doping in semiconductors	3	A1,a2	B4	C4	
4	Conductivity and mobility in semiconductors	4	A3	B4	C4	
5	Hall effect theory	5	A3	B2		
6	PN junction	6	A4	B2	C4	
7	Diode characteristics	7	A3, a4		C2	
8	Midterm exam	8	A1	B2		
9	Troubleshooting of diode	9	A5	B3	C3	
10	Rectifiers circuits	10	A5	B2	C4	
11	Diode application in digital systems	11	A5 a6		C4	
12	Bipolar junction transistor	12	A6	B2	C4	
13	Troubleshooting of BJT,	13	A5, a6	B3	C3	
14	Oral Exam	14	A5, a6	B3	C3	d1,d2,d3
15	Final exam	15	A5, a6	B3		

Course Coordinator: Ass. Prof. Dr. Mohamed Tarek Elewa

Course Instructor: Ass. Prof. Ihsan Abbas Dr. Abdallah Hammad

Head of department: Prof. Dr. Sayed Abo-Elsood Ward

Date: / /

Matrix of Course Content and ILO's

Course Title: Principles of Electronic Engineering **Code:** ECE111
Lecture: 4 **Tutorials:** 2 **Practical:** - **Total:** 6
Program on which the course is given: B.Sc. Electrical Engineering (Communications)
Major or minor element of program: Major
Department offering the program: Electrical Engineering Department
Department offering the course: Electrical Engineering Department
Academic year / level: **First Year / First Semester 2014-2015**
Date of specifications approval: 20/6/2010

Course Content	A1	A2	A3	A4	A5	A6	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3
The atomic levels for materials	✓						✓										
The characteristics of conductors, insulators and semiconductors	✓							✓			✓						
The doping in semiconductors	✓	✓								✓				✓			
Conductivity and mobility in semiconductors			✓							✓				✓			
Hall effect theory			✓					✓									
junction				✓				✓						✓	✓	✓	✓
Diode characteristics			✓	✓								✓					
Troubleshooting of diode					✓				✓				✓		✓	✓	✓
Rectifiers circuits					✓			✓						✓			
Diode application in digital systems					✓	✓								✓			
Bipolar junction transistor						✓			✓					✓			
Troubleshooting of BJT					✓	✓			✓				✓		✓	✓	✓

Matrix of Course Aims and ILO's

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Course Aims	A1	A2	A3	A4	A5	A6	B1	B2	B3	B4	C1	C2	C3	C4	D1	D2	D3
Describe how diodes, transistors, and integrated circuits work, by first have to study semiconductors: materials that are neither conductors nor insulators.	✓		✓			✓			✓	✓		✓		✓	✓	✓	✓
Demonstrate how the doping semiconductor is important in fabrication technology. The rectifier importance to most electronic systems within the power supply which allow current to flow in only one direction.		✓		✓	✓		✓	✓			✓		✓				
Recognize few of applications for diodes and transistors.		✓		✓	✓		✓	✓			✓		✓		✓	✓	

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