



## Course Specification

Course title: Electronic Circuits

Code: Ph. 304

Program(s) on which the course is given: Special Physics

Major or minor element of program: Single

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Double

Department offering the program: Physics

Department offering the course: Physics

Academic: year

 3<sup>rd</sup>

Level

 1<sup>st</sup>

Date of specification approval: 1/2016

### A- Basic information

Academic year: 3rd	Course Title: Electronic circuits	Code:304
Taught hours: Lecture	4 hr/wk	Practical - hr/wk
		Specialty: special physics

### B- Professional Information

1- Overall aims of course	1.1. Demonstrate a good basic knowledge of p-n junctions & Transistors & their related electronic circuits. 1.2. Connect foundation ideas about the physical behavior of these junctions according to their structures, electronic characters and applications.
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### 2- Intended learning outcomes of course (ILOs)

a. Knowledge and Understanding	<b>By the end of the course, students should be able to:</b> a.1. Explain the concept of Semiconducting materials. a.2. Discuss the characteristics of Diodes and Transistors. a.3. Review the application of binary and ternary junctions in electronics.
b. Intellectual Skills	<b>By the end of the course, students should be able to:</b> b.1. Utilize theories of physics to interpret physical phenomena. b.2. Apply appropriate physical principles to create and analyze system components. b.3. Choose optimum solutions for physical problems based on analytical thinking.
c. Professional and Practical Skills	<b>By the end of the course, students should be able to:</b> c.1. Implant comprehensive physical knowledge and understanding as well as intellectual skills in research tasks.
d. General and Transferable Skills	<b>By the end of the course, students should be able to:</b> d.1. Make reports using the internet. d.2. Think independently to find solutions for any problems. d.3. Work in groups effectively, manage time, collaborate and communicate with others positively. d.4. Acquire self- and long life- learning. d.5. Deal with scientific patent considering property right.

### 3. Contents

Topic	No. Hours	Lecture	Tutorial/Practical
<b>A- Diodes:</b>			-
1. Semiconducting materials: intrinsic, p-type & n- type.	4	2	-
	6	3	-
2. Semiconductor diodes, equivalent circuits.	2	1	-
3. Zener & LCD diodes.	2	1	-
4. Load lines.	4	2	-
5. Series & parallel diode configurations.	4	2	-
6. Clipper & Clamper configurations.	6	-	6
7. Problems.			
<b>B- Transistors:</b>	4	2	
1. Small signal amplifiers.	4	2	
2. Class A power amplifier.	4	2	
3. Class B push pull amplifier.	4	2	
4. Class C power amplifier.	4	2	
5. Field Effect Transistors.	4	2	
6. Field Effect Transistors circuit analysis.			
7. Problems.	4	-	4

### 4. Teaching and learning methods

4.1.Using of traditional learning facilities (blackboard) as well as modern ones (computers & projectors) in addition to templates and models
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- 4.2. Avoiding filling minds with raw information and non-understood knowledge. Developing of students capabilities by continuous discussions and direct talks to increase the understanding level.
- 4.3. Yielding the theoretical lessons as well as the practical and laboratorial lessons to achieve best benefits for the given course.
- 4.4. Linking the academic study with the actual practices to maximize the benefits, and to achieve the required results.

## 5- Student assessment

<b>5.1. Methods</b>	5.1.1. Written exam each 2 weeks to push students to follow up lessons.	To assess: Knowledge and Understanding
	5.1.2. Oral tests at the beginning of each lecture to know the student's capability for understanding and follow up.	-To assess: Knowledge and Understanding - Intellectual Skills
	5.1.3. Asking students to do researches to measure, increase and develop their capabilities in collecting information from different sources and integrating it in an easy and simple reports.	To assess: Professional and Practical Skills
<b>5.2. Assessment schedule</b>	Assessment 1:	Week: each week
	Assessment 2:	Week: each 2 weeks
	Assessment 3:	Week: 12 <sup>nd</sup>
<b>5.3. Weighting of assessments</b>	Semester Work %	14%
	Oral Examination %	6%
	Practical Examination %	
	Final Examination%	80%
	Other Type of assessments%	
	Total %	100%

## 6- List of references

<b>6.1. Course Note (if available)</b>	Available
<b>6.2. Recommended Book</b>	6.2.1. Analog Circuits, Yuping Wu (ed.) , InTech , 2013 6.2.2. Introduction to Electronics, Yatindra Nath Singh, Joseph John , NPTEL , 2007 6.2.3. Electronic Devices and Circuit theories, Robert L. Boylestad, Internantional edition, 9 <sup>th</sup> ed. International Student Edition, McGraw Hill Book Company, New York 1998. 6.2.4. Integrated Electronics, Millman-Halkies, International Student Edition, McGraw Hill Book Company, New York 1976. 6.2.5. Basic Electronics, James J. Brophy, International Student Edition, McGraw Hill Book Company, New York 1977. 6.2.6. Electronic Devices, Thomas L. Floyed (1984). 6.2.7. Electronic Fundamentals and Applications for Engineering and Scientists, Millman & Halkais (1982). 6.2.8. Electronic principals, Albert & Davis (1983).
<b>6.3. Periodical journals,..... etc.</b>	Not Available

## 7- Facilities required for teaching and learning:

- The English language must be taught annually during the four academic years, including scientific subjects. Lecturers of the Faculty of Science with good English language can help.
- Well finished class rooms that are equipped with modern educational facilities like computers, data show.
- Integrated laboratories equipped with electronic instruments that are in relation with the theoretical lessons.
- Outside training in the related fields.

Course ILO's Versus program ILO'S												
Course ILO's		Knowledge and Understanding	Intellectual Skills			Professional and Practical Skills		General and Transferable Skills				
		A.20	B.3	B.1	B.2	C.8	C.9	D.1	D.3	D.4	D.6	D.8
Knowledge and Understanding	a.1	X										
	a.2	X										
	a.3	X										
Intellectual Skills	b.1		X									
	b.2			X								
	b.3				X							
Professional and Practical Skills	c.1					X	X					
General and Transferable Skills	d.1							X				
	d.2								X			
	d.3									X		
	d.4										X	
	d.5											x

Course coordinator:

Name: Prof. Dr. Asmaa Abdelghany Omara

Name: Prof. Dr. kamilia sedeeq Abdu

Head of Department: Prof. Dr. Azza Abdel-Raouf

Signature \_\_\_\_\_ Date : \_\_/\_\_/\_\_\_\_\_.

Signature \_\_\_\_\_ Date : \_\_/\_\_/\_\_\_\_\_.

Signature \_\_\_\_\_ Date : \_\_/\_\_/\_\_\_\_\_.

The aim of the course	Course content	u				Teaching and learning methods	Assessment tools	criteria
		Knowledge and Understanding	Intellectual Skills	Professional and Practical Skills	General and Transferable Skills			
1-Demonstrate a good basic knowledge of p-n junctions & Transistors & their related electronic circuits.  2-Connect foundation ideas about the physical behavior of these junctions according to their structures , electronic characters and applications .	Semiconducting materials: intrinsic, p-type & n- type.	a.1	b.2	c.1	d.1	Lectures and discussion.  Solved problems and homework problems	Written Exam  Oral exam  Practical exam	Course note and the final exam results
	Semiconductor diodes, equivalent circuits.	a.2	b.1	c.1	d.2			
	Zener & LCD diodes.	a.3	b.3	c.1	d.3			
	Load lines. Series & parallel diode configurations.	a.1 a.2	b.3 b.2	c.1	d.4			
	Clipper & Clamper configurations.	a.1 a.3	b.1 b.3	c.1	d.5			
	Small signal amplifiers. Class A power amplifier.	a.2	b.3	c.1	d.1 d.2			
	Class B push pull amplifier.	a.3	b.2	c.1	d.3			
	Class C power amplifier.	a.2 a.3	b.3	c.1	d.4 d.5			
	Field Effect Transistors.	a.3	b.1	c.1	d.2 d.1			
Field Effect Transistors circuit analysis.	a.2	b.2 b.1	c.1	d.3 d.4				