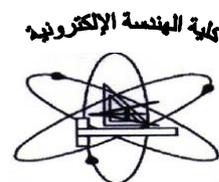


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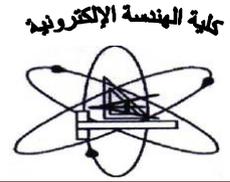
Department offering the program: Electronics and Electrical Communications
Department offering the course: Electronics and Electrical Communications Engineering

Course Specification

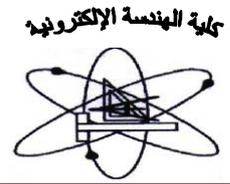
1- Course basic information :		
Course Code: ECE113 Department requirement	Course Title: Electronics (1)	Academic year: 2015/2016 Level (1) – Semester : 1st
Field: Basic Eng. Science	Teaching hours: Lecture [2] Tutorial [1] Lab [1]	

2- Course Objectives	<ol style="list-style-type: none"> 1. To introduce students to Semiconductor physics related to electronics. 2. To provide students with the concepts of diffusion current in P-N junction 3. To enhance the student skills to demonstrate biasing of P-N junction. 4. To teach students different types of P-N junctions. 5. To encourage students to understand Electron ballistics. 6. To provide students with Semiconductor diodes applications. 7. To teach students Zener diodes and other elements. 8. To develop student's skills to understand Light emitting diodes, Solar cells, photodiodes and liquid crystal display.
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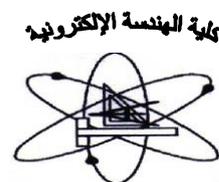
3- Intended Learning Outcomes:		Course ILOs
ARS		
A- Knowledge and Understanding:	A.1 Explain concepts and theories of mathematics and sciences, appropriate to the Electronics.	A1.1 Explain concepts of Semiconductor physics. A1.2 Explain concepts of diffusion currents and biasing. A1.3 Explain concepts of Electron Ballistics. A1.4 Explain concepts of Zener diodes. A1.5 Explain concepts of Light emitting diodes, Solar cells, photodiodes and liquid crystal display materials
	A.3 Define characteristics of engineering materials related to the Electronics.	A3.1 Define characteristics of semiconductor materials. A3.2 Define characteristics of Light emitting diodes, Solar cells, photodiodes and liquid crystal display materials.
	A.15 Interpret principles of analyzing and design of electronic circuits and components.	A15.1 Interpret principles of analyzing and design of P-N Junction diodes. A15.2 Interpret principles of analyzing and design of Semiconductor diodes applications. A15.3 Interpret principles of analyzing and design of Zener diodes applications.



<p style="writing-mode: vertical-rl; transform: rotate(180deg);">B- Intellectual Skills</p>	<p>B.2 Select appropriate solutions for engineering problems based on analytical thinking.</p> <p>B.5 Assess and evaluate the characteristics and performance of components, systems and processes.</p> <p>B.6 Investigate the failure of components, systems, and processes.</p>	<p>B2.1 Select appropriate solutions for P-N Junction Diodes.</p> <p>B2.2 Select appropriate solutions for electron ballistics problems.</p> <p>B2.3 Select appropriate solutions for Semiconductor diodes application problems.</p> <p>B2.4 Select appropriate solutions for Zener and other two PN junction Devices.</p> <p>B5.1 Assess and evaluate the characteristics and performance of P-N Junction Diodes</p> <p>B5.2 Assess and evaluate the characteristics and performance of Zener Diodes</p> <p>B5.3 Assess and evaluate the characteristics and performance of Light emitting diodes, Solar cells, photodiodes and liquid crystal display materials.</p> <p>B6.1 Investigate the failure of P-N Junction Diodes and Zener Diodes.</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">C- Professional Skills</p>	<p>C.1 Apply knowledge of mathematics, science, design, and engineering practice integrally to solve engineering problems.</p> <p>C.5 Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze and interpret results.</p> <p>C.8 Apply safe systems at work and observe the appropriate steps to manage risks.</p> <p>C.12. Prepare and present technical reports.</p>	<p>C1.1 Apply knowledge of mathematics, science, design, and engineering practice integrally to solve engineering problems related to electron ballistics, and Diode Applications</p> <p>C5.1 Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze and interpret results related to P-N junctions, Semiconductor diodes applications, Zener diodes, Light emitting diodes, Solar cells, photodiodes and liquid crystal display.</p> <p>C8.1 Apply safe systems at work and observe the appropriate steps to manage risks during doing experiments related to P-N junctions, Semiconductor diodes applications, Zener diodes, Light emitting diodes, Solar cells, photodiodes and liquid crystal display..</p> <p>C12.1 Prepare and present technical reports in electron ballistics.</p> <p>C12.2 Prepare and present technical reports in Diode Applications, Zener and other two PN junction Devices.</p>



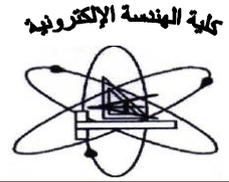
D- General Skills	D.1. Collaborate effectively within multidisciplinary team.	D1.1 Collaborate effectively within multidisciplinary team during laboratory work.
	D.2. Work in stressful environment and within constraints.	D2.1 Work in stressful environment and within constraints during solving problems, doing experiments and in exams.
	D.3. Communicate effectively.	D3.1 Communicate effectively in tutorial and lab. times.
	D.6. Effectively manages tasks, time, and resources.	D6.1 Effectively manages tasks, time, and resources during solving problems, doing experiments and in exams.
	D.7. Search for information and engage in life-long self learning electronics.	D7.1 Search for information about Electron ballistics. D7.2 Search for information on topics related to Semiconductor diodes application and Zener diodes and other elements. D7.3 Search for information on topics related to Light emitting diodes, Solar cells, photodiodes and liquid crystal display.
	4- Course Contents	Semiconductor physics – Semiconductors – Diffusion current in P-N junction – Biasing of P-N junction – Different types of P-N junctions – Electron ballistics – Semiconductor diodes application – Zener diodes and other elements- Light emitting diodes- Solar cells- photodiodes- liquid crystal display.
	5- Teaching and Learning Methods	<ul style="list-style-type: none"> - Lectures - Tutorials - Laboratory experiments. - Reports
6- Teaching and Learning Methods for disable students	<ul style="list-style-type: none"> • Official low cost special classes for developing student skills, arranged by the faculty administration. • Assign a portion of the office hours for those students. • Face-to-face intermediate solving the problems and quizzes during the tutorials times and laboratory work. • Repeat the explanation of theoretical and practical material in tutorials, and laboratory times. 	
7- Student Assessment		
a- Assessment Methods	<ul style="list-style-type: none"> - Weekly sheet exercises at class room/Labs - Quizzes - Midterm, and final exams 	
b- Assessment Schedule	<ul style="list-style-type: none"> - Exercises or laboratory reports : Weekly - Quizz-1: Week <u>no</u> 4 - Mid-Term exam: Week <u>no</u> 8 - Quizz.2: Week <u>no</u> 12 - Laboratory practical exam Week no 15 - Final – term examination: Week <u>no</u> 16 	



c- Weighting of Assessment	- Semester work and quizzes : 20 % - Oral and Practical exam: 20 % - Final – term examination: 60 % <p style="text-align: right;">Total 100 %</p>
8- List of text books and references:	
a- Course notes	There are lectures notes prepared in the form of a book authorized by the department
b- Text books	[1] Albert P. Malvino, Electronic Principles, 2006, amazon publisher
c- Recommended books	[1] Alyis J. Evans , Basic Electronics , ISBN: 980945053224 , 2004 , Master publishing. [2] John Sparkes, Semiconductor Devices, 2 nd Edition, 1994 [3] P. Arun, Electronics, 2006, amazon publisher.
d- Periodicals, Web sitesetc	http://semiconductors.globalspec.com/Specifications/Semiconductors/Discrete/Diodes/Diodes_All_Types http://semiconductors.globalspec.com/Specifications/Semiconductors/Discrete/Diodes/Zener_Diodes http://www.allaboutcircuits.com/vol_3/chpt_7/5.html

Course contents - ILOs Matrix

Content Topics	Week	A- Knowledge & Understanding	B- Intellectual skills	C- Professional and practical skills	D- General and transferable skills
Semiconductor physics	1	A1.1			D1.1, D2.1, D3.1, D6.1
Semiconductors	2-3	A1.1, A3.1			D1.1, D2.1, D3.1, D6.1
Diffusion current in P-N junction – Biasing of P-N junction	4	A1.2, A15.1	B2.1, B5.1, B6.1	C1.1, C5.1, C8.1	D1.1, D2.1, D3.1, D6.1
Different types of P-N junctions	5-6	A15.1	B2.1, B5.1, B6.1	C1.1, C5.1, C8.1	D1.1, D2.1, D3.1, D6.1
Electron ballistics	7	A1.3	B2.2	C1.1, C12.1	D1.1, D2.1, D3.1, D6.1, D7.1
Semiconductor diodes applications	9-10	A15.2	B2.3, B5.1, B6.1	C1.1, C5.1, C8.1, C12.2	D1.1, D2.1, D3.1, D6.1, D7.2
Zener diodes and other elements	11-12	A1.4, A15.3	B2.4, B5.2, B6.1	C1.1, C5.1, C8.1, C12.2	D1.1, D2.1, D3.1, D6.1, D7.2
Light emitting diodes- Solar cells- photodiodes- liquid crystal display.	13-15	A1.5, A3.2	B5.3	C5.1, C8.1	D1.1, D2.1, D3.1, D6.1, D7.3



Teaching and Learning Methods - ILOs Matrix

Teaching and Learning Methods	A- Knowledge & Understanding	B- Intellectual skills	C- Professional and practical skills	D- General and transferable skills
Lectures	A.1, A.3, A.15	B.2,B.5,B.6	C.1	D3
Tutorials/ Labs	A.1, A.3, A.15	B.2,B.5,B.6	C.1, C.5, C.8	D1, D2, D3, D6
Reports	A.1, A.3, A.15	B.2,B.5,B.6	C.1, C.5, C.8, C.12	D2, D6, D7

Assessment Methods - ILOs Matrix

Assessment Methods	A- Knowledge & Understanding	B- Intellectual skills	C- Professional and practical skills	D- General and transferable skills
Weekly sheet exercises	A.1, A.3, A.15	B.2,B.5,B.6	C.1	D1, D2, D3, D6
Reports	A.1, A.3, A.15	B.2,B.5,B.6	C.1, C.5, C.8, C.12	D2, D6, D7
Oral and practical exam	A.1, A.3, A.15	B.2,B.5,B.6	C.1, C.5, C.8	D2, D6
Quizzes Midterm, and Final Written exams	A.1, A.3, A.15	B.2,B.5,B.6	C.1	D2, D6

Authorized from department board at 15/05/2016

Authorized from college board at 05/06/2016

Course coordinator:
Dr. Mohamed Zain

Head of Department:
Prof. Fathi El-Sayed Abd El-Samie