



Course Specification

Course Name: [Electronics – 2]

Course Code: [IT112]

I. Basic Course Information

Major or minor element of program: [General]

Department offering the course: [Information Technology Department]

Academic level: [100 Level]

Semester in which course is offered: [Second (Spring) Semester]

Course pre-requisite(s): [Electronics - 1 IT111]

Credit Hours: 3

Contact Hours Through:

Lecture	Tutorial*	Practical*	Total
2.5	1.5	1.5	4.0

* 1.5 hours for **either** Tutorial or Practical

Approval date of course specification: January 2015

II. Overall Aims of Course

[Electronics-2 is designed for computer science students. The course will focus on the principles and applications of basic electronic devices and circuits. Students will be provided experiences to develop and enhance problem-solving skills, critical thinking skills, reasoning, graphical analysis, data collection and interpretation of data.]

III. Program ILOs covered by course

Program Intended Learning Outcomes (By Code)			
Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
[K1,K13]	[I2]	[P9]	[G1,G6,G9]



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IV. Intended Learning Outcomes of Course (ILOs)

a. Knowledge and Understanding

On completing the course, students should be able to:

- K.1 Have knowledge and understanding of characteristics of semiconductor materials.
- K.2 Describe the operation of basic semiconductor devices in words, by mathematical equations and by models.
- K.3 Determine the electrical characteristics of the device and apply them for electronic circuit analysis.
- K.4 Recall basic electronic devices structure and operation.]

b. Intellectual/Cognitive Skills

On completing the course, students should be able to:

- I.1 Apply knowledge and solving problems about semiconductor materials characteristics and p-n junction properties.
- I.2 Analyze diodes characteristic curves and solve diode based circuits.
- I.3 Troubleshoot a typical dc power supply.
- I.4 Examine and solve problems about transistors construction, operation, and characteristics.]

c. Practical/Professional Skills

On completing the course, students should be able to:

- P.1 Collect and analyze experimental data that are used to investigate physical phenomena and electronic device characteristics.
- P.2 Demonstrate the validity of physical principles through the comparison of the experimental results to the mathematical/theoretical description.
- P.3 Learn the function of various sorts of instruments and devices used in experimental electronics.
- P.4 Represent graphically a set of data.]

d. General and Transferable Skills

On completing the course, students should be able to:

- G.1 Acquire scientific and intellectual abilities such as critical thinking.
- G.2 Report writing.
- G.3 Appreciate electronics applications in ICT and life.
- G.4 Search available data and knowledge resources.]

V. Course Matrix Contents

	Main Topics / Chapters	Duration (Weeks)	Course ILOs Covered by Topic (By ILO Code)			
			K & U	I.S.	P.S.	G.S.
1-	Intrinsic Semiconductors	2	K1,K2	I1	P1,P2,P4	All
2-	carrier transfer	2	K1	I1	P1,P2,P4	All
3-	Semiconductor diode	3	K2,K3	I2	All	All
4-	Transistors	2	K4	I3,I4	All	All
5-	DC analysis of BJT	1	K4	I3,I4	All	All
6-	Small-signal model and AC analysis of BJT	1	K4,K5	I3,I4	All	All
7-	Operational Amplifiers	2	K4,K5	I3,I4	All	All
	Net Teaching Weeks	13				



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VI. Course Weekly Detailed Topics / hours / ILOs

Week No.	Sub-Topics	Total Hours	Contact Hours	
			Theoretical Hours	Practical Hours*
1	Intrinsic Semiconductors	2.5	2.5	
2	Carrier transfer	4	2.5	1.5
3	Carrier transfer	4	2.5	1.5
4	Semiconductor diode	4	2.5	1.5
5	Semiconductor diode	4	2.5	1.5
6	Transistors	4	2.5	1.5
7	Midterm Exam			
8	Transistors	4	2.5	1.5
9	Transistors	4	2.5	1.5
10	Transistors	4	2.5	1.5
11	DC analysis of BJT	4	2.5	1.5
12	Small-signal model and AC analysis of BJT	4	2.5	1.5
13	Operational Amplifiers	4	2.5	1.5
14	Operational Amplifiers	4	2.5	1.5
15	Final Exam			
Total Teaching Hours		51	33	18

* No Practical/Tutorial during the first week of the semester

VII. Teaching and Learning Methods

Teaching/Learning Method	Selected Method	Course ILOs Covered by Method (By ILO Code)			
		K & U	Intellectual Skills	Professional Skills	General Skills
Lectures & Seminars	<input type="checkbox"/>	[All]	[All]	[All]	[All]
Tutorials	<input type="checkbox"/>	[All]	[All]	[All]	[All]
Computer lab Sessions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Practical lab Work	<input type="checkbox"/>	[All]	[All]	[All]	[All]
Reading Materials	<input type="checkbox"/>	[All]	[All]	[All]	[All]
Web-site Searches	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Research & Reporting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Problem Solving / Problem-based Learning	<input type="checkbox"/>	[All]	[All]	[All]	[All]
Projects	<input type="checkbox"/>	[All]	[All]	[All]	[All]
Independent Work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Group Work	<input type="checkbox"/>	[All]	[All]	[All]	[All]
Case Studies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Presentations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Simulation Analysis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Others (Specify):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



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VIII. Assessment Methods, Schedule and Grade Distribution

Assessment Method	Selected Method	Course ILOs Covered by Method (By ILO Code)				Assessment Weight / Percentage	Week No.
		K & U	I.S.	P.S.	G.S.		
Midterm Exam	[]	[K1,K2,K3]	[I1,I2]	[All]	[All]	[20%]	[7]
Final Exam	[]	[All]	[All]	[All]	[All]	[60%]	[15]
Quizzes	[]	[]	[]	[]	[]	[]	[]
Course Work	[]	[All]	[All]	[All]	[All]	[10%]	[Every week]
Report Writing	[]	[]	[]	[]	[]	[]	[]
Case Study Analysis	[]	[]	[]	[]	[]	[]	[]
Oral Presentations	[]	[]	[]	[]	[]	[]	[]
Practical	[]	[All]	[All]	[All]	[All]	[10%]	[Every week]
Group Project	[]	[All]	[All]	[All]	[All]	[Bonus]	[14]
Individual Project	[]	[]	[]	[]	[]	[]	[]
Others (Specify):	[]	[]	[]	[]	[]	[]	[]

IX. List of References

Essential Text Books	<ul style="list-style-type: none"> [Microelectronic circuits (sixth edition) Adel S. Sedra (University of Waterloo), Kenneth C. Smith (University of Toronto)]
Course notes	<ul style="list-style-type: none"> [PowerPoint slides]
Recommended books	<ul style="list-style-type: none"> [None]
Periodicals, Web sites, etc ...	<ul style="list-style-type: none"> [None]

X. Facilities required for teaching and learning

List the facilities required <ul style="list-style-type: none"> • Computer and data show • Computer lab

Course coordinator: [Ass. Prof. Nivin Ghamry]

Head of Department: Prof Hesham El Mahdy

Date: [January 2015]