Course specification

(1203 Electronics)

Faculty:	*HICIT- **Higher Institute for Computers & Information Technology**-El Shorouk Academy*
Programme(s) on which the course is given:	Under graduate program in Computer Science
Major or minor element of programme:	Compulsory
Department offering the programme	Department of Computer Science
Department offering the course:	Department of Computer Science
Year / Class	1st Year – 2nd semester
Date of specification approval	1/8/2022

A- Basic Information

Title: Electronics	***Code:*** 1203		
Weekly Hours:			
Lecture: 3	**Exercise: 3**	**Practical:**	**Total:6**

B- Professional Information

1- Course Objectives:

This course (CS1203) introduces the student to electric and electronic circuit analysis.
The course starts with linear circuit's analysis including:-

- Types of resistors, resistors connection and equivalent resistors.
- Types of power supplies
- Equivalent circuit

Then, goes through linear elements, capacitors, inductors, diodes, transistors, and operational amplifiers with simplified circuit analysis in each case.

2- Program ILOs Covered by Course

Program Intended Learning Outcomes			
Knowledge and understanding	**Intellectual Skills**	**Professional and practical skills**	**General and Transferable skills**
A8	**B1, B4, B7, B8**	**C6, C9**	**D9**

3 - Intended learning outcomes of course (ILOs)

After Completing this course the student must demonstrate the Knowledge and ability to analyse

Linear circuits and simple nonlinear circuits. This includes: equivalent resistor for linear circuits, Thevenin's and Norton's Equivalent, types of resistors and power supplies, diodes concept of operation, transistors and their application, and operational amplifiers.

a.Knowledge and Understanding

a1. Explain the types of resistors and connections: series, parallel, delta and star. [A8]
a2. Explain the types of power supplies to circuits [A8]
a3. Identify the Ohm's law [A8]
a4. Identify Kirchhoff's lows for current, and voltages. [A8]
a5. Identify the concept of diodes operation and in circuit analysis methods [A8]
a6. Identify the concept of transistors operation and in circuit analysis methods. [A8]
a7. Define operational amplifiers concept of operation. [A8]
a8. Clarify the capacitors and inductors connections and behaviour in transient simple RC and RL circuits. [A8]

b: Intellectual skills

Cognitive skills of critical thinking, analysis, synthesis, including :
b1. Apply method of circuit analysis based on the type of circuit. [B7,B8]
b2. Analysis of modes of operation by assumptions then verify to non-linear elements.[B4]
b3. Solve simultaneous equations for nodes and loops. [B8]
b4. Synthesis of clearly and precisely analysis for problems.[B8]

c: Professional and practical skills

c1- Compute the Thevenin's and Norton's Equivalent for linear circuits. [C6]
c2-Compute maximum power load resistors. [C6]
c3- Identify the types of resistors and power supplies from circuit diagrams. [C6]
c4-Compute the resistors value from the color, or the writing on the resistors. [C9]
c5-Perform linear circuit analysis based on mesh, node, loop, superposition, and reduction[C9]
c6-Perform circuit analysis for circuit simple circuits containing diodes,transistors and operational amplifiers.[C9]

d: General and transferable skills

Specifically ability to:
d1. Communicate effectively by oral, written and visual means. [D9]
d2. Work effectively as an individual and as a member of a team. [D9]
d3. Develop Creativity and imagination skills, Self-assessment ability and Critical thinking and analytic ability. [D9]

4- Contents

Topic	**Hours**	**Lec.**	**Exc/Lab**
Basic units and their qualifiers	6	3	3
Ohm's Law	6	3	3
Resistors connection and equivalent resistors	6	3	3
Kirchhoff's laws and their applications	12	6	6
Thevenins's and Norton's equivalent	12	6	6
RL and RC DC circuits	6	3	3
Maximum power load	6	3	3
Diodes	9	6	3

Transistors.	6	3	3
Selected Topics	3	3	
Operational amplifiers	6	3	3

5- Teaching and learning methods

Teaching and learning methods	Used
Active Learning	
Lectures(blending learning – online learning using virtual classroom)	√
Tutorial Exercises (hybrid learning – online learning)	√
Practical Lab(blending learning– online learning)	
Exercises	√
Discussions.	√
Self – Learning strategy	
Reading material	√
Websites search	
Research and reporting	
Self-studies	
Experimental strategy	
Group work	√
Presentation	√
Problem solving strategy	
Problem solving/problem solving learning based	√
Case study	√
Synchronous E-Learning	
Virtual lab	-
Virtual class	-
Chat Room	√
Video lectures	√
Asynchronous E-Learning	
E-Learning	√

6 -Student assessment methods

Methods	Assessment	Used
Electronic Midterm Exam	To assess the knowledge and understanding achieved by the student during the previous weeks. (online on e-learning hub)	√
Pencil-to-Paper Final Exam	To evaluate what the student gain at the end of the course, and to assess: the knowledge and understanding, general skills, and intellectual skills.	√
Course Project	To allow students work in team, and to evaluate	-

	knowledge, understanding, intellectual, and transferable skills. (online on e-learning hub , FTF)	
Electronic Course Work & Quizzes	To keep the student always in the course, and to evaluate knowledge, understanding, intellectual, and transferable skills.(online on e-learning hub)	√
Participation	To assess the knowledge and understanding achieved by the student during the previous weeks.	√

Assessment Schedule

Assessment	**Week #**
Participation	**3-14**
Electronic Mid Term Exam	**8**
Final Exam	**16**
Course Work &Quizzes	**2-14**

Assessment Weight

Assessment	**Weight %**
Participation	
Electronic Mid Term Exam	**10%**
Final Exam	**80%**
Course Work &Quizzes	**10%**
Total	**100**

Course Work &Quizzes: (Short Exams, Assignments, Researches, Reports, Presentations, Class/Project discussion)

7 -List of references

Essential books (text books)	• Patrick, Dale R., and Stephen W. Fardo. *Electricity and electronics fundamentals*. River Publishers, 2020. • Electronics Fundamentals:Circuits, Devices, and Applications Seventh Edition,Thomas L. Floyd, PEARSON Prentice Hall,2010. • Electronics Fundamentals: Circuits, Devices & Applications (8th Edition) 8th Edition byThomas L. Floyd
Periodicals, website	**Powerpoint presentations of all course materials** **All labs material**

8- Required Facilities

None

a. Teaching facilities:

	Lecture	*class*	*Lab*
Whiteboard	used	used	-
Pc/laptop	used	-	-
Data show	used	used	-
Webinars	MS TEAMS	MS TEAMS	-
SocialMedia	Facebook Page for 1st year	Facebook Page for 1st year	-

ChatRoom	ChatTeams	ChatTeams	-
Videos	Youtube	-	-
Website	MOODLE	MOODLE	-

9- Course Matrices

9-1 Course Contents/ILOs Matrix

Course Contents	Knowledge & understanding								Intellectual skills				Professional and practical skills						General		
	a1	a2	a3	a4	a5	a6	a7	a8	b1	b2	b3	b4	c1	c2	c3	c4	c5	c6	d1	d2	d3
Basic units and their qualifiers	x											x									
Ohm's Law			x													x					
Resistors connection and equivalent resistors	x																				
Kirchhoff’s laws and their applications		X		x					x	x	x	x									
Thevenins's and Norton’s equivalent		X	x	x									x	x		x		x			
RL and RC DC circuits								x													
Maximum power load														x				x			
Diodes					x																
Transistors.						x											x				
Selected Topics							x											x			

9-2 Learning Methods /ILOs Matrix

Learning Methods	Knowledge & understanding								Intellectual skills				Professional and practical skills						General		
	a1	a2	a3	a4	a5	a6	a7	a8	b1	b2	b3	b4	c1	c2	c3	c4	c5	c6	d1	d2	d3
Lectures	x	X	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
Tutorial Exercises									x	x	x	x	x	x	x	x	x	x			
Discussions.									x	x	x	x	x	x	x	x	x	x	x	x	x
Reading material	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
Problem solving/problem solving learning based									x	x	x	x									

9-3 **Assessment Methods /ILOs Matrix**

Assessment Methods	**a1**	**a2**	**a3**	**a4**	**a5**	**a6**	**a7**	**a8**	**b1**	**b2**	**b3**	**b4**	**c1**	**c2**	**c3**	**c4**	**c5**	**c6**	**d1**	**d2**	**d3**
Electronic Mid Term Exam	x	x	X	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
Final Exam	x	x	X	x	x	x	x	X	x	x	x	x	x	x	x	x	x	x			
Course Work &Quizzes	x	x	x	x	x	x	x	X	x	x	x	x	x	x	x	x	x	x	x	x	x

10. Course ILOs Vs Program ILOs

Course ILOs \ Prog ILOs		**Knowledge & understanding**	**Intellectual skills**				**Professional and practical skills**		**General**
		A8	**B1**	**B4**	**B7**	**B8**	**C6**	**C9**	**C9**
K&U	**a1**	√							
	a2	√							
	a3	√							
	a4	√							
	a5	√							
	a6	√							
	a7	√							
	a8	√							
Int.	**b1**				√	√			
	b2			√					
	b3					√			
	b4					√			
P. &P.	**c1**						√		
	c2						√		
	c3						√		
	c4							√	
	c5							√	
	c6							√	
General	**d1**								√
	d2								√
	d3								√

Course Coordinator: Dr. Mohamed Moustafa **( )**
Head of Department: Dr. Ahmed El-Abbassy **( )**
Date: 1/8/2022