Future Academy
Higher Future Institute for Specialized Technological Studies

Course Specification

1- Course information:	
Course Code:	BSC 121
Course Title:	Physics
Year/level	1st
Academic Programs	Computer Science Program (B.Sc.)
Contact hours/ week	(Theoretical = 2hrs - Practical = 2 hrs), Total= 4hrs

2- Course aims:

This course aims to provide students with the course introduces students the basic physical quantities, standard units and dimensional analysis. Also, it introduces some physical concept in properties of matter. the course introduces the fundamental laws of electricity and magnetism, the ability to apply electricity and magnetism concepts in different sciences and to develop techniques used in the solution of simple field problems.

3- Intended learning outcomes of the course (ILOs):

a- Knowledge and understanding:

On successful completion of this course, the student should be able to:
a-1 Recognize the Basic physical quantities and dimensional analysis
a-2 Define the basic laws of electricity and magnetism.
a-3 Identify basic concepts of circuit hardware components and software required for implementation.

b- Intellectual skills:

On completing this course, the student should be able to:
b-1 Compare between the logical and physical characteristics, capacities, and constraints of the electric circuit equipment before operating it.
b-2 Develop the hardware and tools for practical application development, support, maintenance, and documentation.

c- Professional and practical skills:

At the end of this course, the student will be able to:
c-1 Analyzes different problems and formulate solutions for different circuit analysis theorems.
c-2 Apply different methodologies used for circuit analysis.
c-3 Analyzes characteristics, elements, connections, and faults for some electric circuits.

On successful completion of this course, the student should be able to:
d-1 The ability to work in groups: work with others as a part of a team to collect data and/or to produce reports and presentations.
d-2 Demonstrate suitable numeracy abilities while understanding and explaining situations with a quantitative component.

4- Course contents

Week No.	Topics/units	Number of hours		ILO's
		Lecture hours	Practical hours	
1	**Introduction to Electrostatics: Electric charge. Conductors, insulators, and induction.**	**2**	**2**	**a1,b3**
2	**Coulomb's Law and solved problems.**	**2**	**2**	**a1,a2,b1**
3	**Electric Fields: Field lines. Electric fields and conductors.**	**2**	**2**	**a2,b1,c1,d1**
4	**Magnetic circuits, Force between charges Reluctance and permeability + Quiz 1**	**2**	**2**	**a1,b3,c1,d1**
5	**Electric fields and conductors**	**2**	**2**	**a2,b2,c1,d1**
6	**The potential energy of a charge and electrostatic potential**	**2**	**2**	**b2,c1**
7	**Midterm Exam**			
8	**Resistance and Resistivity**	**2**	**2**	**a2,a3,b2,c1,d2**
9	**Current and resistance. Current in a wire. Resistivity. Ohm's Law**	**2**	**2**	**a2,a3,b2,c1,d2**
10	**Combinations of Resistors in series and parallel**	**2**	**2**	**a3,b3,c2,d2**
11	**Capacitors and capacitance + Quiz 2.**	**2**	**2**	**a3,b2,b3,c1,d1**
12	**Combinations of capacitors in series and parallel**	**2**	**2**	**a1,b1,c1,d2**
13	**Inductance and physical dimensions**	**2**	**2**	
14	**Revision**	**2**	**2**	

5- Teaching and learning methods

Methods	ILO's																			
	a1	a2	a3	a4	a5	b1	b2	b3	b4	b5	c1	c2	c3	c4	c5	d1	d2	d3	d4	d5

Lectures	√	√	√			√										
Practical sections						√			√	√	√			√	√	
Self-learning									√		√					
Assays and reviews					√											
Discussion groups						√				√				√	√	

6- Teaching and learning methods for Low-achieving students

- Extra teaching hours for those who need help
- More quizzes to assess their ability to understand the course
- Encourage the teamwork for those students with other advanced ones to increase their participation and understanding

7- Student assessment

Assessment method	Time	Grade weight (%)	Week	ILOs
Course Work (Tutorial Exercise and Assignments)	Through the semester	10	Every week	
Quiz 1	Through the lecture	5	Week#4	
Mid-term exam	1 hour	10	Week#7	
Quiz 2	Through the lecture	5	Week#11	
Practical Exam	2 hours	10	Week#14	
Final Written exam	2 hours	60	Week#15-16	

8-List of references

8.1. Student notebooks:

Comprehensive instructor notes ("Power Points Slides") are available on the course web

page ("Google Classroom").

8.2. Essential textbooks:

Michael Tooley, "Electronic Circuits: Fundamentals and Applications", Third Edition, 2006.

8.3. Recommended textbooks:

Narciso Garcia Arthur Damask, "PHYSICS for Computer Science Students", Second Edition, 1998.

8.4. Journals, Periodical and Reports ……..etc.

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8.5. Websites

> **https://library.mccnh.edu/self-study/science/physics**
> **https://libguides.madisoncollege.edu/physics/web**

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