

**Course specification
(1103 Physics)**

Faculty	<i>HICIT - Higher Institute for Computers & Information Technology – El-Shorouk Academy</i>
Programme(s) on which the course is given:	Undergraduate 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	1 st Year – 1 st Semester
Date of specification approval	1/8/2022

1- Basic information

Title: Physics	Code: 1103		
Weekly Hours:			
Lecture: 3	Exercise: -	Practical: 4	Total: 7

2- Professional Information:

1- Overall aims of course

The students learn about the force of interaction between charges (Coulomb's law), the Electric field and the Gauss's law, the electric potential, the capacitances and the effect of dielectrics. They also learn about the steady current and resistances, the magnetic field and forces, uniform magnetic field, the magnetic effect for a current carrier conductors, the laws of induction and the Maxwell's equations. The students should be able to imagine the magnetic, and the electric, field distribution in space, the self and mutual inductance between current carriers, the eddy currents, and the relations between electric and magnetic fields, How to deal with the different kind of capacitors, be able to design the capacitor, understanding the electrical components and units,...

3- Program ILOs Covered by Course

Program Intended Learning Outcomes			
Knowledge and understanding	Intellectual Skills	Professional and practical skills	General and Transferable skills
A4, A5	B1, B4, B7	C6	D11

4- Intended Learning Outcomes of Course (ILOs):

a. Knowledge and Understanding Skills

On successful completion of the course, graduates should be able to:

- a1. Define the motion of different objects regardless of their mass and dimensions, differentiation between linear, two dimension, circular, rotation, rolling and oscillatory motions. [A5]
- a2. Clarify the concept of force and mass, more about the three laws of motion. [A5]
- a3. Define sound waves as a type of mechanical waves.
- a4. Define scientific problems properly. [A5,A4]
- a5. Demonstrate basic knowledge and understanding of a core of analysis and applied mathematics. [A4]
- a6. Interpreting and analyzing data qualitatively and/or quantitatively. [A4,A5]

b. Intellectual Skills

On successful completion of this course, graduate should be able to:

- b1. Identify the relation between Work and Energy (Potential and Kinetic). [B1,B7]
- b2. Identify attributes, components, relationships, patterns, main ideas, and errors.[B4]
- b3. Identify a range of solutions and critically evaluate and justify proposed design solutions.[B4,B7]
- b4. Perform problem analysis from written descriptions; derive requirements specifications from an understanding of problems (analysis, synthesis). [B7]

c. Professional and Practical Skills

On successful completion of this course, graduate should be able to:

- c1. Apply different Physics concepts not only in his field of study but also in life. [C6]
- c2. Apply laws of motion to different types of moving objects in space. [C6]
- c3. Define scientific problems properly and trying their solution. [C6]
- c4. Solve scientific problems. [C6]
- c5. Identify any risks or safety aspects that may be involved in the operation of computing equipment within a given context.[C6]
- c6. Operate computing equipment efficiently, taking into account its logical and physical properties. [C6]

d. General and Transferable Skills

On successful completion of this course, graduates should be able to:

- D1. Communicate effectively by oral, written and visual means. [D11]
- D2. Work effectively as an individual and as a member of a team.[D11]
- D3. Lead and motivate individuals. [D11]
- D4. Manage tasks and resources. [D11]

5- Contents

Topic	Hours	Lecture	Practical
The concept of charge	7	3	4
Coulomb's law-Solved Examples	7	3	4
The electric field-The electric field lines of force-	7	3	4
Calculation of the electric field (charged rod-ring-disk)	7	3	4
Electric flux - Gauss's law	7	3	4
Calculation of the electric field by Gauss's- law-	7	3	4
Motion of charged particle in electric field- Solved examples.	7	3	4
The electric Potential Energy-The electric potential	7	3	4
Calculation of the electric potential	7	3	4
The potential due to an electric Dipole,The Cathode Ray Tube	7	3	4
Capacitances and capacitors, Capacitance of parallel plate, spherical and cylindrical capacitors.	7	3	4
Energy stored in capacitor-Capacitors in series and in parallel-Solves examples	7	3	4
The effect of the dielectric-General problems.	7	3	4

6- 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	√

7- Student assessment methods

- 7.1 Midterm Exam: To assess the knowledge and understanding achieved by the student during the previous weeks. (online on e-learning hub , FTF)
- 7.2 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.
- 7.3 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 , FTF)
- 7.4 Practical Exam: to measure the ability of students to design and implement a software program.

Assessment Schedule

Assessment	Week #
Mid Term Exam	8
Final Exam	16
Course Work & Quizzes	2-14
Practical Exam	15

Assessment Weight

Assessment	Weight %
Mid Term Exam	5%
Final Exam	70%
Course Work & Quizzes	5%
Practical Exam	20%
Total	100

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

8- List of References

Text books :

- Shankar, Ramamurti. *Fundamentals of physics I: mechanics, relativity, and thermodynamics*. Yale University Press, 2019.
- Shankar, Ramamurti. *Fundamentals of physics II: electromagnetism, optics, and quantum mechanics*. Yale University Press, 2020.

9- Facilities Required for Teaching and Learning

Black or white board, overhead projector or data show, speakers

10- Course Matrices

10-1 Course Contents/ILOs Matrix

Course Contents	a1	a2	a3	a4	a5	a6	b1	b2	b3	b4	c1	c2	c3	c4	c5	c6	d1	d2	d3	d4
The concept of charge	√	√	√																	
Coulomb's law-Solved Examples	√																			
The electric field-The electric field lines of force-	√										√	√		√	√	√				
Calculation of the electric field (charged rod-ring-disk)	√						√				√	√		√	√	√				
Electric flux - Gauss's law	√						√				√	√								
Calculation of the electric field by Gauss's- law-		√	√			√	√	√	√	√	√									
Motion of charged particle in electric field- Solved examples.		√	√			√					√									

The electric Potential Energy-The electric potential		√	√			√					√									
Calculation of the electric potential						√		√	√	√	√									
The potential due to an electric Dipole,The Cathode Ray Tube				√		√					√									
Capacitances and capacitors, Capacitance of parallel plate, spherical and cylindrical capacitors.				√							√									
Energy stored in capacitor-Capacitors in series and in parallel-Solves examples				√																
The effect of the dielectric-General problems.				√																

10.2-Learning Method /ILO Matrix

Learning Methods	a1	a2	a3	a4	a5	a6	b1	b2	b3	b4	c1	c2	c3	c4	c5	c6	d1	d2	d3	d4
Lectures	√	√	√	√	√	√	√	√	√	√	√									
Tutorial Exercises						√	√	√	√	√	√									
Practical Lab						√	√	√	√	√	√									
Discussions.						√	√	√	√	√	√	√	√	√	√	√	√	√	√	√

10.3Assessment Methods /ILO Matrix

Assessment Methods	a1	a2	a3	a4	a5	a6	b1	b2	b3	b4	c1	c2	c3	c4	c5	c6	d1	d2	d3	d4
Mid Term Exam	√	√	√	√	√	√	√	√	√	√	√									
Final Exam	√	√	√	√	√	√	√	√	√	√	√									
Course Work &Quizzes	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Practical Exam	√	√	√	√	√	√	√	√	√	√	√									

11. Course ILOs Vs Program ILOs

		K&U		Int.			P. &P.	General
		A4	A5	B1	A4	B7	C6	D11
K&U	a1		√					
	a2		√	√				
	a3		√		√			
	a4	√	√	√				
	a5	√						
	a6	√	√					
Int.	b1			√		√		
	b2				√			
	b3				√	√		
	b4					√		
P. &P.	c1						√	
	c2						√	
	c3						√	
	c4						√	
	c5						√	
	c6						√	
General	d1							√
	d2							√
	d3							√
	d4							√

Course coordinator: Dr. Mostafa Shabaan

Head of Department: Dr. Ahmed El-Abbassy

Date:1/8/2022