



جمهورية مصر العربية

وزارة التعليم العالي والبحث العلمي

Ministry of Higher Education and Scientific Research



المعهد العالي للحاسبات وتكنولوجيا المعلومات
مدينة الشروق - القاهرة
شعبة علوم الحاسب

Course specification

Course Code: BS 121

Course Title: Physics

Academic Year: /

Course specification
(BS 121- Physics)

Course Outline

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 program	Department of Computer Science		
Department offering the course:	Department of Computer Science		
Level	First Level		
Date of specification approval	DD/MM/YYYY		

Basic Information

Code:	BS 121	Title:	Physics
Prerequisites:	None		
Weekly Hours:			
Lecture: 2	Exercise: -	Practical : 2	Total: 3 credit hours

Professional Information

Course Aims:

The objective of BS 121 is to survey the fundamentals of electricity and magnetism. This course will cover the electric field, gauss law, electric potential, capacitors, R-C circuits, magnetic field and force and their applications.

After completing this course students must be able to:

- Understand the fundamental concepts of electricity and magnetism.
- To learn the main laws of electromagnetism.

Program ILOs Covered by Course

Knowledge and understanding	Intellectual Skills	Professional and practical skills	General and Transferable skills
A1, A4	B1, B 5, B7, B12	C13, C15	D5, D12

a1	Understand the essential mathematics relevant to computer science.
a4	Demonstrate basic knowledge and understanding of a core of analysis, algebra, applied mathematics and statistics.
b1	Define traditional and non-traditional problems, set goals towards solving them, and observe results.
b5	Summarize the proposed solutions and their results.
b7	Establish criteria, and verify solutions.
b12	Create and/or justify designs to satisfy given requirements (synthesis, evaluation, application).
c13	Communicate effectively by oral, written and visual means. (NARS P S2)
c15	Prepare technical reports, and a dissertation, to a professional standard; use IT skills and display mature computer literacy. (NARS P S6)
d5	Demonstrate efficient IT capabilities.
d12	Use an appropriate mix of tools and aids in preparing and presenting reports for a range of audiences, including management, technical, users, industry or the academic community.

Intended learning outcomes of course (ILOs)

a. Knowledge and Under-Standing:

- a1- Study fundamental and basic law of applications in electricity, magnetism and electromagnetism. [A1, A4]
- a2- Study Gauss's law in electricity for different type of charged bodies. [A1, A4]
- a3- Determine laws of electric capacitors and effect of dielectric. [A1, A4]
- a4- Study direct current, resistance and solution of simple electric circuits (Kirchhoff laws) [A1, A4]
- a5- Analogy between magnetic field and electric field., and application of Ampere's law, Gauss's law in magnetism. [A1, A4]

b. Intellectual Skills:

- b1- Investigate electric force and electric field (using Gauss's law) [B1, B5]
- b2- study of capacitors' and dielectric effect. And uses of capacitors. [B1, B7]
- b3- Use Kirchhoff's laws to solve simple electric circuits. [B1, B7]
- b4- Use three phase circuits [B1, B5]
- b5- Investigate magnetic force and magnetic field using Gauss law in magnetism and Ampere's law. [B1, B12]
- b6- Compare electric and magnetic field and studying nature of each. [B1, B5]

c. Professional and practical skills

- c1- Identify Ohm's law practically, connection of resistors (series and parallel) and comparison between two nearly equal resistance by Carey-Foster bridge. [C13, C15]
- c2- Determine time constant for (RC, RL) circuits [C13, C15]
- c3- determine the magnetic moment of a magnet. [C13, C15]

d. General and transferable skills

- d1. Display an integrated approach to the deployment of communication skills. [D12]
- d2. Work effectively with database owners and for database users. [D5]
- d3. Strike the balance between self-reliance and seeking help when necessary. [D5, D12]
- d4. Display personal responsibility by working to multiple deadlines in relation to the course requirements. [D12]
- d5. Write and deliver coherent and structured technical reports. [D12]

Contents		
Topic	Contact Hours	
	lecture	Lab
Units and dimensions	2	2
Electric charge	2	2
Coulomb's law	2	2
The electric field	2	2
Gauss's law	2	2
Electric potential	2	2
Capacitors and electric	2	2
Current and resistance	2	2
Electromotive force and circuits	2	2
Kirchhoff's law	2	2
The magnetic field	2	2
Forces and magnetic induction	2	2
Basic circuit theory	2	2
Fundamentals of three phase circuits and transformers	2	2

Teaching and learning methods	
Teaching and learning methods	Used
Lectures	√
Tutorial Exercises	
Practical Lab	√
Discussions.	√
Self – Learning (Reading material, Websites search,)	-
Self-studies	-
Group work	√
Presentation	-
Problem solving/problem solving learning based	√
Case study	-
Synchronous E-Learning	-
Video lectures	-
Asynchronous E-Learning	√

Student assessment methods & Schedule

Methods	Used	Week#
Midterm Exam	√	8
Final Exam	√	16
Course Project	-	-
Course Work & Quizzes	√	5-11
Practical Exam	√	15

Assessment Weight

Assessment	Weight %
Mid Term Exam	15
Practical Exam and Project	15
Final Exam	60%
Course Work&Quizzes	10%
Total	100

Course Work & Quizzes

Short Exams, Assignments.

List of references

Essential books (textbooks)	<p>-Halliday, David, Fundamentals of physics / David Halliday, Robert Resnick, Jearl Walker. —11th ed., John Wiley & Sons Inc., New York, 2018, ISBN: 978-1-119-30685-6.</p> <p>- Physics for Scientists and Engineers with Modern Physics, Tenth Edition Raymond A. Serway and John W. Jewett, Jr. USA 2019, ISBN10: 1-337-55329-8, ISBN13: 978-1-337-55329-2.</p>
Course notes	E-Learning Portal
Recommended books	Young, Hugh D. Sears and Zemansky's university physics: with modern physics. -- 13th ed. / Hugh D. Young, Roger A. Freedman; contributing author, A. Lewis Ford. Addison-Wesley 2012.
Periodicals, website	PowerPoint presentations of all course materials All labs material [https://learn.sha.edu.eg/course/view.php?id=1362]
Videos link	

Required Facilities

Tools & SW (Technology facilities):	<ul style="list-style-type: none"> - Microsoft TEAMS to create virtual classrooms for lectures, discussions for project. - Academy Portal (MOODLE) to make electronic quizzes and electronic midterm exam. - Academy Portal (MOODLE) to upload project deliverable and assignment. - Academy portal (MOODLE) to upload electronic material. 	
Teaching facilities:	Whiteboard	√
	Physics Lab	√
	Data show	√
	E-Learning	√
	Videos	-
	Website	-

Course Content/ILO Matrix

Course Contents	Knowledge & understanding					Intellectual skills						Professional and practical skills			General					
	a1	a2	a3	a4	a5	b1	b2	b3	b4	b5	b6	c1	c2	c3	d1	d2	d3	d4	d5	
Units and dimensions	X		X			X														
Electric charge	X		X			X														
Coulomb's law	X		X			X														
The electric field		X	X	X		X														
Gauss's law		X		X		X														
Electric potential	X	X				X														
Electric capacitance							X					X								
Current and resistance				X				X				X			X	X	X	X	X	X
Electromotive force and circuits				X				X				X								
Kirchhoff's law					X				X	X	X			X						
The magnetic field				X	X		X	X	X					X	X	X	X	X	X	X
Forces and magnetic induction				X				X				X		X	X	X	X	X	X	X
Basic circuit theory					X				X		X	X	X							
Fundamentals of three phase circuits and transformers					X					X										

Learning Method /ILOs Matrix

Learning Methods	Knowledge & understanding					Intellectual skills						Professional and practical skills			General				
	a1	a2	a3	a4	a5	b1	b2	b3	b4	b5	b6	c1	c2	c3	d1	d2	d3	d4	d5
Lectures	x	X																	
Tutorial Exercises	x	X							x	x	x	x	x						
Problem solving	x	x	x	x	x	x	x	x	x	x	x	x							
Group work															x	x	x	x	x
Practical Lab				x	x			x		x					x	x	x	x	x

Assessment Methods /ILOs Matrix

Assessment Methods	Knowledge & understanding					Intellectual skills						Professional and practical skills			General				
	a1	a2	a3	a4	a5	b1	b2	b3	b4	b5	b6	c1	c2	c3	d1	d2	d3	d4	d5
Mid Term Exam	x	X																	
Final Exam	x	x	x	x	x				x	x	x	x	x						
Course Work & Quizzes	x	x	x	x	x				x	x	x		x						
Practical Exam												x			x	x	x	x	x

Course ILOs Vs Program ILOs

Prog ILOs Course ILOs		Knowledge & understanding		Intellectual skills				Professional and practical skills		General	
		A1	A4	B1	B5	B7	B12	C 13	C15	D5	D12
Knowledge and Understanding	a1	√	√								
	a2	√	√								
	a3	√	√								
	a4	√	√								
	a5	√	√								
Intellectual skills	b1			√	√						
	b2			√		√					
	b3			√		√					
	b4			√	√						
	b5			√			√				
	b6			√	√						
Professional and practical skills	c1							√	√		
	c2							√	√		
	c3							√	√		
General skills	d1									√	√
	d2										
	d3										√
	d4										√
	d5										√

Course Coordinator: Dr. Moustafa Shaaban ()

Head of Department:Dr.Ahmed El-Abbassy ()

Date: --/--/2023