هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد
NCAAA

2024
TP-153

Course Specification
(Bachelor)

Course Title:	**Principles of Physics-2**
Course Code:	**1309 Phys-3**
Program:	**Bachelor for Computer Science**
Department:	**Physics**
College:	**Sciences**
Institution:	**King Khalid University**
Version:	**TP-153-2024**
Last Revision Date:	**20/01/2025**

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (3 H)					
3 (2+1) hrs					
2. Course type					
A.	☒ University	☐ College	☐ Department	☐ Track	☐ Others
B.	☒ Required		☐ Elective		
3. Level/year at which this course is offered: (2nd level/ 1st year)					
4. Course General Description:					
This course focuses on Electric field and potential, Coulomb laws, electric field for point charges, Electric conductivity, electric current (Ohm's law) and electric energy, Magnets and Magnetism. light and optics, Waves and Sound.					
5. Pre-requirements for this course (if any)**:**					
1308Phys-3					
6. Co-requisites for this course (if any)**:**					
None					
7. Course Main Objective(s):					
This course will introduce students to how to: □ Explain physical phenomena based on the general concepts of physics. □ Define general principles of light, electricity and magnetism. □ Solve problems in light, optics, electricity, and magnetism.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	2h/week	100%
2	E-learning		
3	Hybrid • Traditional classroom • E-learning		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	32
2.	**Laboratory/Studio**	32
3.	**Field**	
4.	**Tutorial**	
5.	**Others (specify)**	
Total		64

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Explain basic scientific facts, concepts, and principles related to the optics, electricity and magnetism.	K1	Lectures, electronic lectures, group discussion.	quizzes, written exams Mini project reports Homework assignments
1.2	Describe the applications related to electricity and magnetism.	K2		
2.0	**Skills**			
2.1	Use the laws and mathematical methods of optics, waves, electricity and magnetism to solve problems.	S1	Class lectures Group discussion the internet resources	Tutorials Homework assignments. Research Assignments
2.2	Illustrate some physical phenomena using concepts of magnetism and electricity.	S2		
2.3	Choose the suitable concepts and laws of waves, electricity and magnetism in solving and explaining problems.	S1		
3.0	**Values, autonomy, and responsibility**			
3.1	Practice self-learning skills	V2		Explain and discover an interactive discussion continuous observation
3.2	Participate information with his colleagues during discussion sessions	V1 & V3	Self-study Scientific discussion in group	

C. Course Content

No	List of Topics	Contact Hours
1.	**The Electric Charge and Electric Field** Properties of electric charge, Charging objects by induction, Coulomb's Law, Electric field for point charges, Electric conductivity and electric energy.	6
2.	**Electric Potential** Potential Difference and electric potential Relation between electric field and potential,	4
3.	**Direct Current and Resistance** Electric current, voltage, Ohm's law, resistance and resistivity, series and parallel electric circuits, equations for resistors in series and parallel circuits, electric power, Kirchhoff's circuit laws electric current (Ohm's law)	6
4.	**Magnets and Magnetism** Permanent magnet, magnetic fields around electrical conductors, magnetic field lines, magnetic force acting on a charge moving in a magnetic field, magnetic torque, density of the magnetic field, mass spectrometer,	6
5.	**Light and Optics** Electromagnetic spectrum, specular reflection, Snell's law, optical physics and geometric optics	4
6.	**Waves and Sound** Transverse and longitudinal waves, sinusoidal waves (amplitude, wavelength), absorption, reflection, refraction, interference, polarization and Doppler Effect	6
	Total	**32**

Practical Work

No	List of Topics	Contact Hours
2.	Electrics measurements	3
2.	Coulomb's Law	3
3.	The Electric Field Mapping	3
4.	Construction of Voltmeter	3
5.	Combinations of Capacitors	4
6.	The charge and discharge of a capacitor	4
7.	Ohm's Law	3
8.	Resistors in Series and Parallel	3
9.	Magnetic Field, Biot Savart Law	3
10.	Standing waves	3
	Total	**32**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Homework + class short exams	5th week	5%
2.	Mid-Term	7th week	30%
3.	Computerized short exams	6th and 11th week	5%
4.	Lab exam	16th week	20%
5.	Final examination	At the end of the semester	40%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	Kyle, Ph.d. Kirkland, Electricity and magnetism, 1st edition, (2007), Publisher: Facts on File. ISBN 13: 9780816061129 Physics for Scientists and Engineers by Raymond A. Serway and John W. Jewett. ISBN 0534408427 Thomson Brooks/Cole © 2004; 6th Edition
Supportive References	Purcell E.M., Morin D.J., Electricity and Magnetism, 3ed Edition (2013), Cambridge University Press. ISBN 13:78-1-107-01402-2
Electronic Materials	Selected electronic lectures in electricity and magnetism.
Other Learning Materials	No further materials are recommended

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	**A classroom with its facilities that accommodates forty students**
Technology equipment (projector, smart board, software)	**Data show, laptop, smart board and internet.**
Other equipment (depending on the nature of the specialty)	-----

F. Assessment of Course Quality

Assessment Areas/Issues	Assessors	Assessment Methods
Effectiveness of teaching	Students	Indirect method

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of Students assessment	Course instructor	Direct method
Quality of learning resources	Students	Indirect method
	Program Leaders Faculty	Direct and indirect method
The extent to which CLOs have been achieved	Course instructor Program Leaders Faculty	Direct and indirect method
Other		

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	Physics Department Council
REFERENCE NO.	The meeting No. 6 for the academic year 1446, the recommendation No. 3.6.46
DATE	2/5/1446 H