2023
TP-153

Course Specification
(Bachelor)

Course Title:	Physics (2)
Course Code:	203207-4
Program:	Bachelor in Computer Science
Department:	Department of Computer Science
College:	College of Computers and Information Technology
Institution:	Taif University
Version:	V1.2024
Last Revision Date:	01/02/2024

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (4)					
2. Course type					
A.	☐University	☒ College	☐Department	☐Track	☐Others
B.	☒ Required		☐Elective		
3. Level/year at which this course is offered: (4/2)					
4. Course general Description:					
This course covers important parts in electricity and magnetism. Students will study electric fields, electric flux, Gauss`s law and its applications. Magnetic fields and magnetic forces. Sources of the magnetic field. Finally, Faraday's law, Lenz's law, electromotive force and some different types of AC circuits will be studied.					
5. Pre-requirements for this course (if any)**:**					
Physics (1) (203206-4)					
6. Pre-requirements for this course (if any)**:**					
None					
7. Course Main Objective(s):					
- **Establishes a foundation in electricity and magnetism.** - **Introduces main topics such as electric field and flux, magnetic fields and the magnetic forces, Faraday's law and AC circuits, electromagnetism, and its applications.** - **Recognizes the connection between electricity and magnetism and its applications.** **Gives an overview and understanding of basic physics, with moderate use of mathematical formalism.**					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	5	100%
2	E-learning	0	0
3	Hybrid • Traditional classroom • E-learning	0	0
4	Distance learning	0	0

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	45
2.	**Laboratory/Studio**	30
3.	**Field**	0
4.	**Tutorial**	0
5.	**Others (specify)**	0
Total		75

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	Understand the fundamental principles of electricity and magnetism.	K1	Lecture Discussion	Written Exams Quizzes Assignments
1.2	Understand fundamentals equations (Laws) and linking them to corresponding phenomena.	K1	Lecture Discussion	Written Exams Quizzes Assignments
1.3	Identify the basic concepts and theories of electric fields, magnetic fields, source of magnetic fields, and alternating current circuits.	K1	Lecture Discussion	Written Exams Quizzes Assignments
2.0	**Skills**			
2.1	Apply the main fundamental laws and theories to solve the problems of electric	S1	Problem solving	Written exam Activities

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	fields, magnetic fields, source of magnetic fields, and alternating current circuits.			
2.2	Develop a skill versatility in solving problems in electric fields, magnetic fields, source of magnetic fields, and alternating current circuits.	S1	Problem solving	Written exam Activities
2.3	Analyze qualitatively and quantitatively experimental data of electricity and magnetism.	S1	Practical	Lab reports Lab exam
3.0	**Values, autonomy, and responsibility**			
3.1	Work effectively and responsibly even in teamwork in performing activities and experiments.	V2	Practical	Lab reports Lab exam Activities
3.2	Act responsibly and ethically in conducting their work.	V1	Practical Discussion	Indirect evaluation

C. Course Content

No	List of Topics	Contact Hours
1	Unit 1: **Electric fields** ▪ Electric field of a continuous charge distribution ▪ Electric field lines ▪ Motion of charged particles in a uniform electric field	**10**

	▪ Gauss's law Applications of Gauss's law to various charge distributions	
2	Unit 2: **Magnetic fields** ▪ Magnetic fields and forces ▪ Magnetic force acting on a current-carrying conductor ▪ Torque on a current loop in a uniform magnetic field ▪ Motion of a charged particle in a uniform magnetic field ▪ Applications involving charged particles moving in a magnetic field ▪ Velocity selector Mass spectrometer	**10**
3	Unit 3: **Sources of the Magnetic field:** ▪ The Biot-Savart Law ▪ The magnetic force between two parallel conductors ▪ Amperes Law ▪ The magnetic field of a solenoid ▪ Magnetic flux Gauss's Law in magnetism	**10**
4	Unit 4: **Induced electromotive force** ▪ Faraday's law of induction ▪ Some applications of faradays law Lenz's law	**10**
5	Unit 5: **Alternating current circuits** ▪ AC sources ▪ Resistors in an AC circuits ▪ Inductors in an AC circuits ▪ Capacitor in an AC circuits ▪ The RLC series circuit ▪ Power in an AC circuit Resonance in a series RLC circuit	**5**
	Part 2	
2	**Experiment 1:** Kirchhoff's Laws	**2**
3	**Experiment 2:** Voltage transformation with a transformer	**4**
4	**Experiment 3:** Determination of self-inductance of an inductive coil in a series RL AC circuit	**2**
5	**Experiment 4:** Determination of the capacitance of a capacitor in a series RC AC circuit	**4**
6	**Experiment 5:** Charging and discharging of capacitor	**2**
7	**Experiment 6:**	**4**

	Use of Oscilloscope in measurement of AC Voltage and Frequency	
8	**Experiment 7:** Relationship between V_{pp}, V_m and V_{rms} in the calibration of Oscilloscope and/or potentiometer	**2**
9	**Experiment 8:** Tangent galvanometer	**4**
10	**Experiment 9:** Resonance RLC AC circuit	**2**
2	**Experiment 1:** Kirchhoff's Laws	**2**
Total		**75**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1	Midterm exam I	5^{th}	20%
2	Activities (Quiz)	Periodically	20%
3	Lab reports	Weekly	15%
4	Final Lab Exam	15^{th}	5%
5	Final exam	16^{th}	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	Instructors Notes Raymond A. Serway and John W. Jewett, Jr., Physics for Scientists and Engineers with Modern Physics, 9th Edition, Publisher: Brooks/Cole, Print ISBN-13: ISBN: 978-1133954057, (2014).
Supportive References	Raymond A. Serway, Chris Vuille, College Physics, 10th Edition, Publisher: Cengage Learning, 978-1285761954, (2014).
Electronic Materials	Interactive simulations for science and math:

	https://phet.colorado.edu/
Other Learning Materials	NON

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	• A Lecture room appropriate for maximum 25 students with a personal computer, a data show and a smart board. • A Lab room appropriate for maximum 15 students with a personal computer, a data show and a smart board.
Technology equipment (projector, smart board, software)	• Lab materials and required software
Other equipment (depending on the nature of the specialty)	•

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	• Students • Faculty members • Coordinator • Council • Curriculum Committees	• Course exit survey • Feedback from Faculty members • Feedback from Course Coordinator • Feedback from council Feedback from Curriculum Committees
Effectiveness of Students assessment	• Students • Faculty members • Coordinator • Council • Curriculum Committees	• Course exit survey • Feedback from Faculty members • Feedback from Course Coordinator • Feedback from council Feedback from Curriculum Committees
Quality of learning resources	• Students • Faculty members • Coordinator • Council • Curriculum Committees	• Course exit survey • Feedback from Faculty members • Feedback from Course Coordinator • Feedback from council Feedback from Curriculum Committees
The extent to which CLOs have been achieved	• Students • Faculty members	• Course exit survey

Assessment Areas/Issues	Assessor	Assessment Methods
	• Coordinator • Council • Curriculum Committees	• Feedback from Faculty members • Feedback from Course Coordinator • Feedback from council • Feedback from Curriculum Committees
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**CS COUNCIL**
REFERENCE NO.	**MEETING #11**
DATE	**07/03/2024**