هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

2023
TP-153

Course Specification
(Bachelor)

Course Title:	Modern physics
Course Code:	2033105-4
Program:	Bachelor in Physics
Department:	Physics Department
College:	College of Science
Institution:	Taif University
Version:	TP-153
Last Revision Date:	October 2, 2022

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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: (7th Level / 3rd Year)					
4. Course general Description: Concepts of modern physics					
5. Pre-requirements for this course (if any): None					
6. Co-requisites for this course (if any): None					
7. Course Main Objective(s): Advanced description of nature through some theories which were different from classical Physics.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	75	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**	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	State the differences between Galileo relativity and Einstein's special relativity.	K1	Lecture Discussion	Written exam and Homework reports
1.2	Describe the particle aspects of electromagnetic radiation and the wave aspect of material particles, in addition recall the probabilistic interpretation of De Broglie waves.	K2	Lecture and Group discussion	Written exam and Quizzes
...				
2.0	**Skills**			
2.1	Explain physical principles and concepts relevant to the course and their applications.	S1	Lecture	Written exam and activities
2.2	Develop physics problems solving skills.	S2	Problem solving	Written exam and homework reports
...				
3.0	**Values, autonomy, and responsibility**			

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
3.1	Work effectively in groups even when performing experiments.	V1	Group discussion	Lab reports Project
3.2	Act responsibly and be able to prepare a written scientific report.	V2	Group discussion	Homework reports and lab reports
...				

C. Course Content

No	List of Topics	Contact Hours
1.	Unit1: Special theory of relativity • Galileo relativity • Michelson and Morley experiment • Einstein's relativity postulates • Time dilatation • Length contraction • Twins paradox • Energy and momentum transformation in four dimensional space Mass and energy	11
2.	Unit2: Particle aspects of electromagnetic radiation • Black body radiation • Photoelectric effect • Compton effect • Pair production and Annihilation	10
3	Unit3: Wave aspects of material particles • De Broglie – matter- waves • Davisson and Germer experiment • Electron diffraction • Heisenberg uncertainty principle • Correspondence principle • Probabilistic interpretation of De Broglie waves	12
4	Unit4: Atomic structure • Introduction, planetary model • Electron orbits • Atomic spectra • Bohr's model for Hydrogen atom • Energy levels and spectra • Nuclear motion • Atomic excitation	12
Total		45

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Midterm exam I	8th or 9th	20%
2.	Activities	Periodically	10%
3.	Midterm exam I	13th or 14th	10%
4.	Lab reports/ Final Lab Exam	Weakly/13th	20%
4.	Final exam	16th or 17th	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	* Concepts of modern physics. — 6th ed. (2003), Arthur Beiser Published by McGraw-Hill, a business unit of The McGraw-Hill Companies, Inc.
Supportive References	* Modern physics, S. Kenneth, Willey, 1995
Electronic Materials	* Web Sites on the internet that are relevant to the topics of the course & general physics websites such as : - http://hyperphysics.phy-astr.gsu.edu/hbase/hframe.html - http://www.hazemsakeek.info/magazine/ - wikipedia.org/wiki/ physics subjects
Other Learning Materials	* Multi media / CD associated with the text books (when available). * Lecture notes and PowerPoint presentations prepared by the lecturer.

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Classrooms Modern physics laboratory
Technology equipment (projector, smart board, software)	Data show Laptop Smart board
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	• Instructor • Program coordinator • Departmental council • Faculty council	Indirect
Effectiveness of Students assessment	• Students	Indirect
Quality of learning resources	• Students • Instructor • Faculty	Indirect
The extent to which CLOs have been achieved	• Program leaders • Instructor	Direct
Other		

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	PHYSICS DEPARTMENT COUNCIL
REFERENCE NO.	NO. 4-45
DATE	27/09/2023 (12/03/1445)

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