



Course Specification

— (Bachelor)

Course Title: **Nuclear Physics-I**

Course Code: **PHYS26481**

Program: **Physics**

Department: **Physics**

College: **Science**

Institution: **University of Bisha**

Version: **3**

Last Revision Date: 25 July 2023



Table of Contents

A. General information about the course:	3
1. Course Identification.....	3
2. Teaching mode (mark all that apply).....	3
3. Contact Hours (based on the academic semester).....	4
B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods	4
C. Course Content	4
D. Students Assessment Activities	6
E. Learning Resources and Facilities	6
1. References and Learning Resources.....	6
2. Required Facilities and equipment.....	6
F. Assessment of Course Quality	7
G. Specification Approval Data	7



A. General information about the course:

1. Course Identification

1. Credit hours: 3

2. Course type

A. University College Department Track Others

B. Required Elective

3. Level/year at which this course is offered: 7th Level / 4th year

4. Course general Description

This course explores some properties of nuclei, nuclear model, radioactivity, nuclear magnetic resonance, magnetic resonance imaging and the basic experiments in nuclear physic.

5. Pre-requirements for this course:

NA

6. Co- requirements for this course:

NA

7. Course Main Objective(s)

Recognize properties of nuclei, nuclear models, the radioactivity, the nuclear magnetic resonance.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1.	Traditional classroom	3	100%
2.	E-learning		
3.	Hybrid <ul style="list-style-type: none"> • 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	
3.	Field	
4.	Tutorial	
5.	Others (specify)	
	Total	45

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	Describe some properties of nuclei.	K.2	Lectures Solve problems	Written test Reports Homework Quizzes
1.2	List the different nuclear model.	K.2		
1.3	Define the radioactivity.	K.2		
1.4	Recognize the nuclear magnetic resonance.	K.2		
2.0	Skills			
2.1	Solve problems related to nuclei properties.	S.1	Lectures Solve problems.	Written test Reports Homework Quizzes
2.2	Apply the nuclear model.	S.1		
2.3	Solve problems in the decay process.	S.1		
2.4	Analyze the magnetic resonance Imaging.	S.1		
3.0	Values, autonomy, and responsibility			
3.1	Apply academic and professional ethical values effectively and efficiently.	V.1	Lectures Self-learning	Questionnaire

C. Course Content

No	List of Topics	Contact Hours
1.	Some Properties of Nuclei Unit of energy and mass Charge and Mass The Volume and Density of a Nucleus	4.5





	The Size and Structure of Nuclei. Nuclear Stability.	
2.	Some Properties of Nuclei The Size and Structure of Nuclei. Nuclear Stability.	4.5
3.	Nuclear Model Nuclear Binding Energy Applying the Semi Empirical Binding-Energy Formula	4.5
4.	Nuclear Model The Liquid-Drop Model.	4.5
5.	Nuclear Model The Shell Model. Nuclear spin	4.5
6.	Radioactivity The Decay Processes Alpha Decay Beta Decay	4.5
7.	Radioactivity Carbon Dating Radioactive Dating Gamma Decay	4.5
8.	Radioactivity Natural Radioactivity Artificial radioactivity Nuclear Reaction	4.5
9.	Nuclear Magnetic Resonance and Magnetic Resonance Imaging Nuclear magneton Nuclear magnetic resonance	4.5
10.	Nuclear Magnetic Resonance and Magnetic Resonance Imaging The potential energy interaction Magnetic resonance imaging	4.5
Total		45

Table: The matrix of consistency between the content and the learning outcomes of the course.

	Course Learning Outcomes								
	1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4	3.1
Topic 1	✓				✓				✓
Topic 2	✓				✓				✓
Topic 3		✓				✓			✓
Topic 4		✓				✓			✓
Topic 5		✓				✓			✓
Topic 6			✓				✓		✓
Topic 7			✓				✓		✓
Topic 8			✓				✓		✓





Topic 9				✓				✓	✓
Topic 10				✓				✓	✓

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Homework, quizzes, reports, and presentation.	1: 15	10 %
2.	First term exam	7: 8	20 %
3.	Second term exam	12:13	20 %
4.	Final exam	End of Semester	50 %

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	<ul style="list-style-type: none"> - Physics for Scientists and Engineers, 10th Edition, by Raymond A. Serway, John W. Jewett, BROOKS/COLE CENGAGE Learning, Boston USA, (2019). - Nuclear Physics - Graduate Texts in Physics, 1st Edition, Anwar KAMAL, Springer Heidelberg New York Dordrecht London, (2014).
Supportive References	<ul style="list-style-type: none"> - Problems and Solutions in Nuclear and Particle Physics, Edited by Sergio Petrera, Springer Nature Switzerland AG., (2019). - Nuclear and Particle Physics an introduction, by B. R. Martin, Wiley & Sons, Ltd, Southem Gate, Chichester West Sussex PO19 8SQ, England, (2006). - Worked examples in modern physics, Volume 1, P. Rohers and A. Stephens, London ILIFFE BOOKS LTD, Dorset House, England, (2013).
Electronic Materials	<ul style="list-style-type: none"> - Blackboard. - PowerPoint presentations. - Digital library of University of Bisha https://ub.deepknowledge.io/Bisha
Other Learning Materials	NA

2. Required Facilities and equipment

Items	Resources
facilities	Classrooms, Physics lab.
Technology equipment	Data show or smart board.





Items	Resources
Other equipment	NA

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Extent of achievement of course learning outcomes.	Teachers, students.	Direct (Final exams), Indirect (Questionnaire).
Effectiveness of teaching.	Teachers, students.	Indirect (Questionnaire)
Effectiveness of assessment.	Teachers, students.	Indirect (Questionnaire)
Quality of learning resources	Teachers, students.	Indirect (Questionnaire)
Quality of facilities available	Teachers, students.	Indirect (Questionnaire)
Fairness of evaluation	Peer reviewer.	Direct (Final exams reevaluation).

G. Specification Approval Data

COUNCIL /COMMITTEE	College of Science Council
REFERENCE NO.	20
DATE	17 August 2023

