Department: Physics Programme: **B.Sc.**

ATMIYA UNIVERSITY
Faculty of Science

For the students admitted from A.Y. 2023-2024 & onwards		
Offering Department: **Physics**	Offered to: **B.Sc. Physics / Mathematics / Chemistry / Industrial Chemistry**	
Semester - II		
Course Code	Course Title	Course Credit and Hours
23UGPY201	**Physics-II**	**4 Credits - 4hrs/wk(T)**

Course Description:

This course will enhance students understanding of fundamental concepts of different topics of modern physics like radioactivity, X-ray ,Duality of radiation ,wave mechanics and structure of atom. The basics concepts of transistor and digital electronics are also covered in the course.

Course Purpose:

This course aims to provide basic understanding modern physics and topics of electronics like transistor and logic gates

Course Outcomes: Upon completion of this course, the learner will be able to

CO No.	CO Statement	Blooms taxonomy Level (K_1 to K_6)
CO_1	Understand the **General Properties X- ray**	K1&K2
CO_2	Understand **Radioactivity**	K2&K3
CO_3	Understand the **concept of waves and sound**	K3
CO_4	Understand **Different atomic models**	K3
CO_5	Understand **Different transistors and their types**	K1, K3
CO_6	Understanding **Number systems and logic gates**	K2&K3

Course Content	Hours
Module-I: Radioactivity and X-Ray	**12 hrs**
Basic concept of radioactivity	

• Radioactivity • Natural and Artificial Radioactivity • General Properties of Radioactive Radiation, and Radioactive Disintegration **Law of disintegration** • Law of Radioactive Disintegration • Decay Constant • Half-life Period **X-Ray** • Production of X-Rays • Properties of X-Ray • Applications of X-Ray • Continuous and characteristics X-Ray • Numerical Problems.	
Module II: Waves & Sound	**12hrs**
• Wave motion • Differential equation of a wave motion • Particle velocity and wave velocity • Velocity of transverse waves along a stretched string • Melde's experiment **Sound** • Introduction • Newton's formula for velocity of sound in air and velocity of sound in water • Laplace's correction , velocity of sound in isotropic solids	
Module III: Structure of atom	**12hrs**
• Failure of Classical Mechanics , • Effect of Nuclear Motion on Atomic Spectra • Correspondence Principle , Critical Potentials • Atomic Excitation, Vector Model • Quantum numbers (only definitions) • Numerical problems	
Module IV: Transistor	**12hrs**
• Basic structure of transistor • Working of transistor • Different biasing of transistor • CE , CB and CC configuration • Input and Output characteristics of CE transistor • Relation between current gain in common emitter and common base mode • Comparison between CE , CB and CC configuration	
Module V : Digital electronic • Introduction to binary number system and rules for binary arithmetic • Introduction to Boolean algebra and rules for Boolean algebra • Introduction to octet and hexadecimal number system	

• Basic logic gates (AND , OR and NOT) • Universal logic gates (NOR and NAND) • BCD number system • Decimal to BCD encoder circuit • BCD to Decimal decoder circuit • Half adder and full adder circuit	

Methods of Assessment & Tools:
Components of CIE: 30 marks

Sr. No.	Component	Content	Duration (if any)	Marks	Sub Total
A	Test 1	1st 2 units	$1^{1/2}$ hours	5 (Set for 30)	20
	Test 2	All 5 units	3 hours	15 (Set for 70)	
B	Assignment			5	10
C	Class activity			5	
				Grand Total	**30**

Assignment	• Abstract and executive summary • Experimental design • Concept mapping • Student generated handbook • Essay writing etc.
Class activity	• Reaction paper • Quiz • One-minute paper • Situation based question • Application card etc..

Note : Any other assessment tools or methods can be adopted as per requirement of the course.

Department: Physics Programme: **B.Sc.**

ATMIYA UNIVERSITY
Faculty of Science

For the students admitted from A.Y. 2023-2024 & onwards		
Offering Department: **Physics**	Offered to: **B.Sc. Physics / Mathematics / Chemistry / Industrial Chemistry**	
Semester - II		
Course Code	Course Title	Course Credit and Hours
23UGPY202	**Practical: Physics-II**	**2 Credits - 4hrs/wk(T)**

Course Description:

This course will enhance students understanding of fundamental concepts of different topics of modern physics, waves and electronics.

Course Purpose:

This course aims to provide basic understanding modern physics and topics of electronics like transistor and logic gates

Course Content	**Hours**
List of Practical	**40 hrs**
1. Study Of Resonator 1 2. Study Of Resonator 2 3. Melde's Experiement 1 4. Melde's Experiment 2 5. Sonometer 1: Law of vibrating String (Constant Length) 6. Sonometer 2: Law of vibrating String (Constant frequency) 7. Sonometer 3: To determine frequency of a.c. source 8. Transistor Characteristics 9. PN Junction Diode 10. Zener diode 11. Photo diode 12. Study of Logic gates 13. NAND gate as a universal Gate	

Reference Book: (For Practical)

1. C.L.Arora Practical Physics, S. Chand Comp.
2. Chauhan & Singh Advanced Practical Physics. Pragati Prakashan.

3. Experimental Physics, University Granth Nirman Board, (Gujarati Medium)

Methods of Assessment & Tools:

Components of CIE: 50 marks

Sr. No.	CIA Component (Practical)	Marks
1	Viva-voce	15
2	Performance	25
3	Record book and journal	10
Total Marks		**50**

Note : Any other assessment tools or methods can be adopted as per requirement of the course.