

Semester – I		
Course Code	Course Title	Credits
23UGPY101	Physics-I	4

Course Description:

This course is will enhance students understanding of fundamental concepts of different topics like Elasticity, wave and oscillations of classical and thermal physics. Two very fundamental and important of Newtonian mechanics that is work energy power and rotational are also included in the course. Concepts included in the course can further be extended to advance classical mechanics and material physics

Course Purpose:

This course aims to provide basic understanding of Newtonian mechanics which is foundation platform of classical physics and concepts of elastics behavior of substance can help to understanding mechanical properties of solid , the oscillation theory can help students in very wide spectrum from crystal vibrations to structure of atom , different concepts of basic electronics can be useful to develop students understanding of material behavior at

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

CO No.	CO Statement	Blooms taxonomy Level (K₁ to K₆)
CO ₁	Work, Energy And Power/ Conservation Laws	K1
CO ₂	A.C. & D.C. Circuits	K2
CO ₃	Elastic behavior of solids	K2
CO ₄	Oscillations	K3
CO ₅	Rotational Mechanics	K1, K3

Course Content	Hours
Module-I : Work, Energy And Power/ Conservation Laws	8 hrs

<ul style="list-style-type: none"> • Introduction • Review Of Newton's Laws Of Motion • Conservation Of Linear Momentum and its application • Concept of Work and Power • Conservative Forces (Spring force and gravitational force) • Kinetic Energy-Work-Energy Theorem • Potential Energy • Force energy relation for conservative force • The Law Of Conservation Of Energy • Elastic Collision One Dimensional System and two dimension 	
<p>Module-II: A.C. , D.C. Circuits And Semiconductor diode</p> <ul style="list-style-type: none"> • RC circuits analysis and time constant.(Capacitor charging and discharging). • Growth and decay of current in L-R circuit with D.C. source • A.C.Circuits • Review of Alternating currents, Cycle, Frequency, Phase • R.M.S value of Alternating currents • L-C-R series A.C.source • L-C-R series resonance • Parallel resonance • Rectifiers (half & full with mathematical parameters) • Filter circuits • Zener diode and voltage regulations 	11 hrs
<p>Module III: Elasticity</p>	12hrs
<ul style="list-style-type: none"> • Introduction • Stress And Strain • Hooke's Law (Only Definition) • Young's Modulus • Bulk Modulus • Modulus Of Rigidity • Poisson's Ratio • Equivalence Of Shear To Compression & Extension • Relation Between Y, K, η & Σ • Determination Of Young's Modulus By Searle's Method • Bending Of Beam • Bending Moment Of A Beam 	
<p>Module IV: Oscillations</p>	9 hrs
<ul style="list-style-type: none"> • Introduction • Simple Harmonic Motion • Define: Frequency, Amplitude, Wavelength, Time Period 	

<ul style="list-style-type: none"> • Equation For Simple Harmonic Motion • Phase Constant • Energy Of Simple Harmonic Motion • Torsional Pendulum • Damped Oscillation • Forced Oscillation & Resonance 	
Module V: Rotational Mechanics	10 hrs
<ul style="list-style-type: none"> • Concept of centre of mass for system of particle and rigid body • Rotational motion of rigid body and concepts of angular velocity and acceleration • Torque and angular momentum • Law of conservation of angular momentum • Moment of inertia of rigid (Ring ,Disc , Rod and Solid sphere) • Theorem of parallel and perpendicular axis • Condition of rolling without sliding • Total energy of rigid body rolling without sliding 	

Text books (2 textbooks):

- Introduction To Classical Mechanics – R.G. Takwale & Puranik, Tata Mcgraw-Hill Education.
- Fundamentals Of Physics By Halliday, Resnick & Walker, Welly Publication.

Reference books (2 or 3 reference books):

- Modern Physics - R.Murugesan & Kiruthiga Sivaprasath, S.Chand Comp.
- . Engineering Physics - R.K.Gaur, S.L.Gupta, Dhanpat Rai Publications
- Classical Mechanics – H. Goldstein, Addison-Wesley Publication.
- Classical Mechanics Of Particles And Rigid Bodies – Kiran C. Gupta, Welly Publication.
- Classical Mechanics – Y.R. Waghmare, Prentice-Hall Of India.

Pedagogic tools:

- Chalk and Board
- Power point presentation
- Seminar
- Videos

Methods of Assessment & Tools:

Components of CIE: 40 marks (Example as below)

Sr. No.	Component	Content	Duration (if any)	Marks	Sub Total
A	Test 1	1 st 2 units	1 ^{1/2} hours	5 (Set for 30)	20
	Test 2	All 5 units	3 hours	15 (Set for 60)	
B	Assignment			5	10
C	Class activity			5	
Grand Total					30
Assignment		<ul style="list-style-type: none">• Abstract and executive summary• Experimental design• Concept mapping• Student generated handbook• Essay writing etc...			
Class activity		<ul style="list-style-type: none">• 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
B.Sc.

Programme:

ATMIYA UNIVERSITY
Faculty of Science

For the students admitted from A.Y. 2022-2023 & onwards		
Offering Department: Physics	Offered to: B.Sc. Physics	
Semester - I		
Course Code	Course Title	Course Credit and Hours
23UGPY102	Physics-I Practical	2Credits - 4hrs/wk(T)

Course Description:

This course will enhance students understanding of fundamental concepts of different topics of classical physics and electronics.

Course Purpose:

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

Course Content	Hours
List of Practical	40 hrs
<ul style="list-style-type: none">• Using Bar Pendulum/Katter Pendulum, Find The Value Of 'G' By K• Using Bar Pendulum/Katter Pendulum, Find The Value Of 'G' By Graph• Using Bifilar Suspension, Find The Value Of Moment Of Inertia By Standing Waves• Using Bifilar Suspension, Find The Value Of Moment Of Inertia By Twisting Waves• Using Torsional Pendulum, Find The Value Of Moment Of Inertia.• Using Torsional Pendulum, Find The Value Of Modulus Of Rigidity.• Using Searle's Method, Find The Value Of Young's Modulus• Using Searle's Method, Find The Value Of Modulus Of Rigidity• Find Young's Modulus By Bending Of Beam (Constant Mass)• Find Young's Modulus By Bending Of Beam (Constant Length)• Find Young's Modulus By Cantilever (Constant Mass)• Find Young's Modulus By Cantilever (Constant Length)	

<ul style="list-style-type: none"> • L-C-R series Resonance • L-C-R parallel Resonance • Maximum Power Transfer Theorem • Discharge Rate of Capacitor • Potentiometer • Projection Method • Ohm's law 	
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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: 20 marks (Example as below)

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

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