

Semester Lecture Plan

Name of the college: Government College of Arts, Science & Commerce, Sanquelim-Goa							
Name of Faculty: Aga D. A. ,Ms. Pradnya Korgoankar and Ms Suvarna Patil				Subject: Physics (THEORY) and (PRACTICALS)			
Paper code: PHY- 200 Properties of Matter & Sound			Program/Course: S.Y. B.Sc.		Division: A		
Academic year: 2025 – 2026			Semester: III		Total Lectures: 45 Lectures and Practicals		
Course Objectives: This course aims to provide the students with a foundation in basic knowledge of Properties of Matter & Sound							
Course Learning Outcome: The student after undergoing this course will be able to: 1. Describe and explain the elastic behavior of solids,Relation between stress ,strain, Young’s Modulus , Bulk Modulus (K), Modulus of rigidity and Poisson’s ratio. 2) Explain parameters involved in Fluid Flow 3) ELUCIDATE Simple Harmonic Motion and its applications.4)Discuss different types of waves in terms of its velocity and energy. 5) Illustrate about the velocity of sound waves in fluids and air.							
Month	Lectures From: To:		No. of lectures allotted	Topic, Subtopic to be covered	Learning outcome	ICT Tools	Reference books
JUNE	20/06/2025	28/06/2025	03	Hook’s law, Stress Strain diagram, Elastic behaviours of solids in general (Elastic after effect, Elastic hysteresis, Elastic	The student will be able to: 1. Describe and explain Hook’s law, Stress Strain diagram, Elastic	White board and marker	D. S. Mathur, Elements of Properties of Matter, S. Chand and Sons

				fatigue),	behaviours of solids in general (Elastic after effect, Elastic hysteresis, Elastic fatigue),		
June & JULY	30/06/2025	05/07/2025	03		The student will be able to: . Describe and explain working stress factor of safety, factors affecting elasticity (effect of hammering, rolling and annealing, effect of impurities, effect of change of temperature) Moduli of Elasticity,	White board and marker	D. S. Mathur, Elements of Properties of Matter, S. Chand and Sons
				Working stress factor of safety, factors affecting elasticity (effect of hammering, rolling and annealing, effect of impurities, effect of change of temperature) Moduli of Elasticity,			
JULY	07/07/2025	12/07/2025	03	, Equivalence of shear to compression and extension at right angles, Deformation of cube (Bulk modulus),	The student will be able to: 1) Describe and explain , Equivalence of shear to compression and extension at right angles, Deformation of	White board and marker	D. S. Mathur, Elements of Properties of Matter, S. Chand and Sons

					cube (Bulk modulus),		
			02	PRACTICAL	Velocity of sound in air using Helmholtz resonator		
JULY	14/07/2025	19/07/2025	03	modulus of rigidity, Young's modulus) Relation connecting elastic constants, Poisson's ratio and its relation with bulk modulus and modulus of rigidity	The student will be able to: 1. Describe and explain modulus of rigidity, Young's modulus) Relation connecting elastic constants, Poisson's ratio and its relation with bulk modulus and modulus of rigidity	White board and marker	D. S. Mathur, Elements of Properties of Matter, S. Chand and Sons
			02	PRACTICAL	Modulus of rigidity by torsional pendulum .		
JULY	21/07/2025	26/07/2025	03	limiting values of Poisson's ratio.	The student will be able to:	White board and marker	D. S. Mathur, Elements of

				Twisting couple on a cylinder, Beams, Bending of beams, flexural rigidity. Cantilever (rectangular bar), depression in a beam supported at ends and loaded in the middle.	1. Describe and explain limiting values of Poisson's ratio. Twisting couple on a cylinder, Beams, Bending of beams, flexural rigidity. Cantilever (rectangular bar), depression in a beam supported at ends and loaded in the middle.		Properties of Matter, S. Chand and Sons
			02	PRACTICAL	REVISION		
July and August	28/07/2025	02/08/2025	03	Fluid Flow Streamline flow, turbulent flow, Equation of continuity of flow, energy of a liquid in flow, Bernoulli's theorem, Bernoulli's equation	The student will be able to: . Describe and explain Fluid Flow Streamline flow, turbulent flow, Equation of continuity of flow, energy of a liquid in flow, Bernoulli's theorem, Bernoulli's	White board and marker	D. S. Mathur, Elements of Properties of Matter, S. Chand and Sons . R K Bansal, Fluid Mechanics, Firewall Media, (2005).

					equation		
			02	PRACTICAL	Determination of γ using Flat spiral spring.		
AUGUST	04/08/2025	09/08/2025	03	applications of Bernoulli's theorem: Torricelli's theorem and Venturimeter, Viscosity, coefficient of viscosity, Critical velocity,	The student will be able to: Explain Torricelli's theorem and Venturimeter, Viscosity, coefficient of viscosity, Critical velocity,	White board and marker	R K Bansal, Fluid Mechanics, Firewall Media, (2005).
			02	PRACTICAL	Determination of η using Flat spiral spring.		
AUGUST	11/08/2025	16/08/2025	03	Reynold's number and its significance, Poiseuille's equation for flow of a liquid through a horizontal tube and its corrections	The student will be able to: Explain Reynold's number and its significance, Poiseuille's equation for flow of a liquid through a horizontal tube and its corrections	White board and marker	1. Malvino and Leach, Digital Principles and Applications, TMH (1986). 2. R. P. Jain, Modern Digital Electronics, TMH (2003).
			02	PRACTICAL	REVISION		
AUGUST	18/08/2025	23/08/2024	03	fluid flow, Stokes law, Ostwald viscometer, viscosity of gases:	The student will be able to: Explain fluid flow, Stokes	White board and marker	R K Bansal, Fluid Mechanics, Firewall Media, (2005).

				Mayer's formula	law, Ostwald viscometer, viscosity of gases: Mayer's formula,		
			02	PRACTICAL	Bending of beams-double cantilever: determination of Young's modulus.		
September	02/09/2025	06/09/2025	03	Sound: Simple Harmonic Motion Simple harmonic motion, differential equation for simple harmonic motion and its solution,	The student will be able to: Explain Sound: Simple Harmonic Motion Simple harmonic motion, differential equation for simple harmonic motion and its solution,	White board and marker	D. R. Khanna and R. S. Bedi, Text book of Sound Atma Ram, New Delhi, 1969
			02	PRACTICAL	Superposition of two mutually perpendicular simple harmonic oscillations - Lissajous figures using CRO		1.
September	08/09/2025	13/09/2025	03		The student	White board	D. R. Khanna and

				relation of velocity and acceleration to displacement, superposition of SHM in a straight line: Two SH vibrations of equal periods but different amplitudes, any number of SH vibrations of same period but different amplitudes	will be able to: Explain relation of velocity and acceleration to displacement, superposition of SHM in a straight line: Two SH vibrations of equal periods but different amplitudes, any number of SH vibrations of same period but different amplitudes,	and marker	R. S. Bedi, Text book of Sound Atma Ram, New Delhi, 1969
			02	PRACTICAL	Revision		
September	15/09/2025	20/09/2025	03	Lissajous figures (concept only). Beats, applications of beats, distinction between stationary interference and beats. Wave motion Transverse and longitudinal waves, mechanical analogy of longitudinal	The student will be able to: Explain Lissajous figures (concept only). Beats, applications of beats, distinction between stationary interference and beats. Wave motion Transverse	White board and marker	D. S. Mathur, Elements of Properties of Matter, S. Chand and Sons, (2013)

				waves	and longitudinal waves, mechanical analogy of longitudinal waves ,		
			02	PRACTICAL	Velocity of sound by forming stationary wave using CRO		
September	22/09/25	27/09/25	03	progressive wave and its general equation, particle velocity and acceleration, relation between wave velocity and particle velocity, differential equation of wave motion, energy of a plane progressive wave. Velocity of sound waves Velocity of longitudinal waves in fluids, Newtons formula for velocity of sound waves in air.	The student will be able to: Explain progressive wave and its general equation, particle velocity and acceleration, relation between wave velocity and particle velocity, differential equation of wave motion, energy of a plane progressive wave. Velocity of sound waves	White board and marker	D. S. Mathur, Elements of Properties of Matter, S. Chand and Sons, (2013)

					Velocity of longitudinal waves in fluids, Newtons formula for velocity of sound waves in air.		
			02	PRACTICAL	To determine the viscosity of fluids by viscometer		
September and October	29/09/2025	04/10/2025	03	Laplace's correction, effect of pressure, density and temperature, Velocity of longitudinal wave in a rod. Kundt's tube experiment to find velocity of sound in a gas or a solid rod. Doppler's effect	The student will be able to: Explain Laplace's correction, effect of pressure, density and temperature, Velocity of longitudinal wave in a rod. Kundt's tube experiment to find velocity of sound in a gas or a solid rod.	White board and marker	D. S. Mathur, Elements of Properties of Matter, S. Chand and Sons, (2013)
			02	PRACTICAL	Revision		

October	06/10/25	11/10/25	03	Source in motion and listener and medium at rest, Listener in motion and	The student will be able to: Explain Source in motion and listener and	White board and marker	D. S. Mathur, Elements of Properties of Matter, S. Chand and Sons, (2013).
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				source and medium at rest, Source and listener both in motion and medium at rest.	medium at rest, Listener in motion and source and medium at rest, Source and listener both in motion and medium at rest.		
			02	PRACTICAL	Practical Exam		
October	12/10/25	15/10/25	03	Effect of wind on the pitch of sound Indirect approach of source and listener	The student will be able to: Explain Effect of wind on the pitch of sound Indirect approach of source and listener	White board and marker	D. S. Mathur, Elements of Properties of Matter, S. Chand and Sons, (2013)
			02	PRACTICAL	Practical Exam		

*Note: Data filled in the above form is sample data.