Lecture Plan

Name of the college: Govt College of Arts Science and commerce Sanquelim Goa

Name of Faculty: Suvarna G Patil	**Subject:** Physics	
Paper code: PHY243	**Program: SY BSc**	**Division: A**
Academic year: 2025- 2026	**Semester: IV**	**Total Lectures: 45L+30P**

Course Objectives: To have basic understanding of Physics	This course provides a broad overview of the topics and skills students are expected to gain during their study of interference, diffraction, polarization, atomic physics, properties of electromagnetic radiation, crystal structure, and X-rays.

Expected Course Outcome:Understand Physics at basic level 1. Analyse the intensity variations of light due to interference, diffraction and

polarization. 2. Apply and demonstrate the various phenomena of optics using experimental methods. 3. Understand the fundamental principles of particle acceleration. 4. Explore principles of atomic physics in various scientific disciplines. 5. Discuss application of X-rays in various fields. Discuss the applications of crystallography in in various sciences.
Student Learning Outcome: Understandng basic physics more deeply

Month	Lecture From	Lecture To	No. of lectures allotted	Topic, Subtopic to be covered	Exercise/ Assignment	ICT Tools	Reference books
Dcember	01/12/2025	6/12/2025	3 +1P	Interference Introduction: Interference by division of wavefront & division of amplitude, Fresnel's biprism and Lloyd's mirror, f **Practical- Cardinal points of lens system**	Solving Problems, question bank at the end of chapater	Chalk board ,PPT	A. K. Ghatak and K. Thyagarajan: Contemporary Optics, Mc Millan (2020) A. K. Ghatak and K. Thyagarajan: Contemporary Optics, Mc Millan (2020)
	8/12/2025	13/12/2025	3+1P	formation of colours in thin films – reflected system, transmitted	Solving Problems,	Chalk board ,PPT	A. K. Ghatak and K. Thyagarajan:

				system, wedge shaped film, Newton's rings. **Practical- Newtons rings: determination of radius of curvature of lens.**	question bank at the end of chapater		Contemporary Optics, Mc Millan (2020)
	15/12/2025	20/12/2025	3+1P	Diffraction: Concept of diffraction, Fresnel & Fraunhoffer diffraction, division of cylindrical wavefront into half period strips, Fresnel's diffraction at 6 straight edge and cylindrical wire **Practical- Spectrometer: determination of dispersive power of prism.**	Solving Problems, question bank at the end of chapater	Chalk board ,PPT	A. K. Ghatak and K. Thyagarajan: Contemporary Optics, Mc Millan (2020)
	22/12/2025	23/12/2025	3++1P	Fraunhoffer diffraction at single, double and N slits. Diffraction grating,	Solving Problems, question bank at the end of chapater	Chalk board ,PPT	A. K. Ghatak and K. Thyagarajan: Contemporary Optics, Mc Millan (2020)

	24/122025	1/01/2026		Christmas Vacation			
January	02/1/2026	3/01/2026	3+1P	width of principal maxima of plane diffraction grating, **REVISION OF PRACTICAL**	Solving Problems, question bank at the end of chapater	Chalk board ,PPT	A. K. Ghatak and K. Thyagarajan: Contemporary Optics, Mc Millan (2020)
	5/01/2026	10/01/2026	3+1P	resolving power of Optical instruments- Raleigh's criterion, resolving power of telescope, Prism and grating. **Practical- Polarimeter**	Solving Problems, question bank at the end of chapater	Chalk board ,PPT	A. K. Ghatak and K. Thyagarajan: Contemporary Optics, Mc Millan (2020)
	12/01/2026	17/01/2026	3+1P	Polarization: Concept of polarization, plane of polarization, polarization by reflection, Brewster's law, **Practical- Determination of Planck's constant using LEDs of at least 4 different colours**.	Solving Problems, question bank at the end of chapater	Chalk board ,PPT	A. K. Ghatak and K. Thyagarajan: Contemporary Optics, Mc Millan (2020)
	19/01/2026	24/01/2026	3+1P	polarization by refraction, double refraction, uniaxial and biaxial crystals, positive and negative crystals, Nicol's prism, Polaroid, **Practical- Photo cell (Verification of Photoelectric effect).**	Solving Problems, question bank at the end of chapater	Chalk board ,PPT	A. K. Ghatak and K. Thyagarajan: Contemporary Optics, Mc Millan (2020)
	26/01/2026	31/01/2026	3+1P	retardation plates – Quarter and Half wave plates, optical activity,		Chalk board ,PPT	A. K. Ghatak and K. Thyagarajan:

				specific rotation, Laurent's half shade polarimeter. **Practical- e/m using Thomson's method.**			Contemporary Optics, Mc Millan (2020)
Februvary	02/02/2026	07/02/2026	3+1P	Properties of electromagnetic radiation Black body radiation, Kirchoff's radiation law, Stefan's law, Wein's law, Raleigh-Jean's law, Planck's law. Photoelectric effect and Compton effect- observation, description, **Practical-Frank Hertz experiment**.	Solving Problems, question bank at the end of chapater	Chalk board ,PPT	Arthur Beiser, Concepts of Modern Physics, 6th Edition, McGraw Hill (2009)
	09/02/2026	14/02/2026	3+1P	derivations of relevant equations and failure of classical physics to explain the same. Experimental verification of the Photoelectric and Compton effects **Revision of Practical**	Solving Problems, question bank at the end of chapater	Chalk board ,PPT	Arthur Beiser, Concepts of Modern Physics, 6th Edition, McGraw Hill (2009)
	16/02/2026	21/02/2026	3+1P	Atomic Physics Measurement of Mass: Thomson's positive ray analysis, Dempster's Mass spectrometer, Bainbridge Mass spectrograph. **Revision of Practical**	Solving Problems, question bank at the end of chapater	Chalk board ,PPT	Arthur Beiser, Concepts of Modern Physics, 6th Edition, McGraw Hill (2009)
	23/02/2026	28/02/2026	3+1P	Review of Bohr's Hydrogen atom, Correction due to finite nuclear mass. Frank Hertz	Solving Problems, question	Chalk board ,PPT	Arthur Beiser, Concepts of Modern Physics, 6th

				experiment and atomic energy levels.	bank at the end of chapater		Edition, McGraw Hill (2009)
March	02/03/2026	07/03/2026	3+1P	X-rays Coolidge tube generator, Continuous X-ray spectra and its dependence on voltage, Duane and Hunt's law, , Wave nature of X rays – Laue's pattern, Diffraction of X-rays by crystal, Bragg's law,	Solving Problems, question bank at the end of chapater	Chalk board ,PPT	Arthur Beiser, Concepts of Modern Physics, 6th Edition, McGraw Hill (2009)
	09/03/2026	14/03/2026	3+1P	Diffraction of X-rays by crystal, Bragg's law, Bragg single crystal spectrometer, Analysis of crystal structure - simple cubic crystal	Solving Problems, question bank at the end of chapater	Chalk board ,PPT	Arthur Beiser, Concepts of Modern Physics, 6th Edition, McGraw Hill (2009)
	16/03/2026	21/03/2026	3+1P	Crystal Structure Crystal lattice, crystal planes and Miller indices, unit cells, typical crystal structures	Solving Problems, question bank at the end of chapater	Chalk board ,PPT	Arthur Beiser, Concepts of Modern Physics, 6th Edition, McGraw Hill (2009)
	23/03/2026	28/03/2026	3+1P	Revision	Solving Problems, question bank at the end of chapater		Arthur Beiser, Concepts of Modern Physics, 6th Edition, McGraw Hill (2009)
	30/03/26	31/03/2026	3+1P	Revision			

*** Assessment Rubrics**

Component	Max Marks
ISA 1	7.5
ISA 2	7.5
ISA 3	7.5
Semester End Exam	60