



Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Semester-II (B.Sc. / B.Sc.-M.Sc.)

Subject Code	Category	Subject Name	TEACHING & EVALUATION SCHEME								
			THEORY			PRACTICAL		L	T	P	Credits
			End Sem University Exam	Two Term Exam	Teachers Assessment*	End Sem University Exam	Teachers Assessment t*				
BSCFS-203	DC	Physics	, 60	20	20	30	20	3	1	2	5

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;
*Teacher Assessment shall be based following components: Quiz /Assignment / Project / Participation in Class, given that no component shall exceed more than 10 marks.

Learning Objectives:

After studying this paper the students will know –

1. Properties of mechanics and acoustic
2. Reflection & refraction of Light
3. Interference of Light
4. Properties & applications of Laser
5. Phenomenon of Radioactivity

UNIT: I – MECHANICS & ACOUSTICS

Concept of force, Inertia, Newton's first law of motion; Momentum, Newton's second law of motion; Impulse; Newton's third law of motion, Law of conservation of linear momentum, Static and kinetic friction, Laws of friction.

Velocity of sound, echo, absorption coefficient, introduction to ultrasonic, production of ultrasonic waves, applications of ultrasonic waves, Generation of sound, amplitude, Vibration, Physical properties of vibrating systems.

UNIT: II – WAVE OPTICS-I:

Reflection of light, Refraction of light, total internal reflection and its applications, Diffraction of light, types of diffraction, Diffraction of light in a single slit, Aberrations in images and types of aberrations. Principle and applications of some optical instruments: Simple Microscope, Compound Microscope, Polarizing Microscope, Stereomicroscope, Comparison Microscope, Electron Microscope, Simple table spectrometer.

UNIT III- WAVEOPTICS-II:

Wave front and Huygens's principle, Huygen's theory of secondary wavelets, Introduction to interference, Interference in thin films, Michelson's Interferometer, Coherent sources,



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Polarisation, Plane polarised light, Brewsters' law, Malus law.

UNIT: IV – ELECTRONICS AND LASER

Conductors, semi-conductors & Insulators, Types of semi-conductors, Conduction in N-type and P-type semi-conductors, Diode, Bias, Rectifier, Transistors, Emitter characteristic curve, Collector characteristic curve, Transconductance, Amplifier.
Production of LASER, Types of LASER, Properties of Laser, applications of LASER, Optical fibres, Propagation of light through optical fibre, Angle of acceptance and numerical aperture.

UNIT: V - NUCLEAR PHYSICS

Composition and size of nucleus, atomic masses, isotopes, isobars, isotones, Nuclear forces, fission, fusion, nuclear properties and half-life, Radioactive decays, alpha, beta & gamma rays, Applications of Radio Isotopes, counters and detectors- Geiger-muller counter, scintillation counter.

Practicals

1. Standard Operating Procedures for using Vernier Caliper, Micrometer Screw Gauge ,
2. Standard Operating Procedures for using Travelling Microscope, Comparison Microscope
3. Standard operating Procedure for using Abbes Refractometer, Stereo Microscope.
4. Determination of refractive index of given liquid using Abbes refractometer (Four Liquid).
5. Determination of refractive index of material of prism using Spectrometer.
6. To identify the fibre using stereo microscope.
7. To determine the wavelength of Sodium lamp using Newton's Ring Experiment
8. To study the 'n' diffraction pattern using spectrometer.
9. To study Forward and Reverse characteristics of Zener diode.
10. Measurement of wavelength of LASER light source using diffraction grating.

Suggested Readings

1. Applied Fluid Mechanics, by- Mott Robert, Pearson Benjamin Cummir, VI Edition, Pearson Education/Prentice Hall International, New Delhi
2. Atomic and Nuclear physics, by- N. Subramanyam, Brijlal.
3. Fundamental of Acoustics 4th Edition, by- Kinsler , John Wiley and Sons
4. Mechanics, by- D. S. Mathur, S Chand.
5. Nuclear Physics, by- S. N. Ghoshal.
6. Optics, by- Brijlal and Subramayam.
7. Physics for Degree Students B.Sc.-Part-I, by- C. L. Arora, Dr. P. S. Hemne, S Chand & Company.
8. The Physics of waves and oscillation, by- N. K. Bajaj, Tata McGraw-Hill, publishing co. ltd.
9. Waves and oscillation, by- N. Subrahmanuam and Brijlal.
10. Laser and Optical fiber communication, by- P.Sarah.
11. LASERS- Theory and Applications, by- Thyagarajan and A. K. Ghatak