

LESSON-PLAN (Session 2020-21) ODD SEMESTER

Name of Professor: Dr Ranjeet Singh

Designation: Associate Professor

Subject: PHYSICS

Class: B.Sc.- (3rd Semester and 1st semester)

Subject/Paper: Optics (B Sc 3rd Sem)

Mechanics (B Sc 1st Sem)

| Sr. No. | Months | Topics to be covered | Remarks if any, |
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| 1 | October 2020 | <p>Interference-I: Interference by Division of Wave front: Young's double slit experiment, Coherence, Conditions of interference, Fresnel's biprism and its applications to determine the Wavelength of sodium light and thickness of a mica sheet. Lloyd's mirror. Difference between Bi-prism and Lloyd mirror fringes, phase change on reflection (Stokes Law), Numericals.</p> | B Sc 3 rd Sem |
| 2 | Nov 2020 | <p>Interference-II: Interference by Division of Amplitude: Plane parallel thin film, production of colors in thin films, classification of fringes in films, Interference due to transmitted light, Interference due to reflected light, wedge shaped film, Newton's rings, Interferometer: Michelson's interferometer, its applications to (i) Standardization of a meter, (ii) determination of wavelength, Numericals.</p> <p>Assignments -I</p> <p>Basic concepts of Classical mechanics:-Mechanics of single and system of particles, Conservation law of linear momentum, Angular momentum and mechanical energy for a particle and a system of particles, Centre of Mass and equation of motion, Constrained Motion</p> <p>Assignments -I</p> | B Sc 3 rd Sem B Sc 1st Sem |
| 3 | Dec 2020 | <p>Diffraction-I: Fresnel's diffraction: Fresnel's assumptions, half period zones, rectilinear propagation of light, zone plate, diffraction at a straight edge, rectangular slit, circular aperture, diffraction due to a narrow slit, diffraction due to a narrow wire, Numericals.</p> <p>Diffraction-II: Fraunhofer diffraction: single-slit diffraction, double-slit diffraction,</p> <p>Test</p> <p>Generalized Notations:- Degrees of freedom and Generalized coordinates, Transformation equations, Generalized Displacement, Velocity, Acceleration, Momentum, Force and Potential, Hamilton's variational principle, Lagrange's equation of motion from Hamilton's principle, Linear Harmonic oscillator, Simple pendulum, Atwood's machine.</p> <p>Test</p> | B Sc 3 rd Sem B Sc 1st Sem |

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| 4 | Jan 2021 | <p>N-slit diffraction. plane transmission grating spectrum, dispersive power of grating. limit of resolution. Rayleigh's criterion. resolving power of telescope and a grating. Differences between prism and grating spectra. Numericals Assignments –2</p> <p>Theory of relativity:- Frame of reference, limitation of Newton's law of motion, Inertial frame of reference, Galilean transformation, Frame of reference with linear acceleration, Classical relativity Galilean invariance, Transformation equation for a frame of reference- inclined to an inertial frame and Rotating frame of reference, Non-inertial frames-The accelerated frame of reference and rotating frame of reference , <u>Effect of centrifugal and coriolis forces due to Earth's rotation</u>, Fundamental frame of reference, Michelson- Morley's experiment, concept of Einstein's relativity. Assignments –2</p> | <p>B Sc 3rd Sem</p> <p>B Sc 1st Sem</p> |
| 4 | Feb 2021 | <p>Applications of theory of relativity:- Special theory of relativity, Lorentz co-ordinate and physical significance of Lorentz invariance, Length Contraction, Time Dilation, Twin Paradox, Velocity addition theorem, Variation of mass with velocity, Mass energy equivalence, Transformation of relativistic momentum and energy, relation between relativistic momentum and energy, Mass, velocity, momentum and energy of zero rest mass.</p> | <p>B Sc 1st Sem</p> |
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*Vacation as per university calendar

- 2 Assignments and 01 unit test will be taken as per schedule