LESSON PLAN- B.Sc 2nd SEMESTER

Session: 2023-2024

Name of teacher- Dr. Naveen Kumari, Assistant Professor

Subject- Physics (PHY-201) Properties of matter, Kinetic Theory and Relativity

CLASS	WEEKS	SYLLABUS
B.Sc 2nd Semester	16-1-2024 to 20-1-2024	**UNIT 1:** Elasticity, Hooke's law, Elastic constants and their relations
	22-1-2024 to 27-1-2024	Poisson's ratio, Torsion of cylinder and twisting couple
	29-1-2024 to 3-2-2024	Bending of beam (bending moment and its magnitude)
	5-2-2024 to 10-2-2024	Cantilevers and centrally loaded beam Test of Unit 1
	12-2-2024 to 17-2-2024	**UNIT 2:** Assumptions of kinetic theory of gases, equipartition of energy and its applications for specific heat of gases
	19-2-2024 to 24-2-2024	Maxwell's distribution of speeds and velocities, Experimental verification of Maxwell's law of speed distribution
	26-2-2024 to 2-3-2024	Most probable , average and r.m.s speed, mean free path, Transport of energy and momentum
	4-3-2024 to 9-3-2024	Diffusion of gases, Brownian motion, real gases, van der Wall's equation
		Test of Unit 2 and Assignment

	11-3-2024 to 16-3-2024 18-3-2024 to 22-3-2024 25-3-2024 to 31-03-2024	**UNIT 3:** Reference systems, inertial frames, Gallilean invariance and conservation laws, newtonian relativity principle Michelson-Morely experiment, Lorentz transformation, length contraction, Time dilation Holi break
	01-4-2024 to 6-04-2024 08-04-2024 to 13-04-2024 15-04-2024 to 31-04-2024 01-05-2024 onwards	Velocity Addition theorem, variation of mass with velocity, mass energy equivalence Assignments, Viva,Test Revision, External Practical Exam MDU examination

LESSON PLAN- B.Sc 2nd SEMESTER

Session: 2023-2024

Name of teacher- Dr. Naveen Kumari, Assistant Professor

Subject- Physics (PHY-202) Electromagnetic induction and Electronic devices

CLASS	WEEKS	SYLLABUS
B.Sc 2nd Semester	16-1-2024 to 20-1-2024 22-1-2024 to 27-1-2024 29-1-2024 to 3-2-2024 5-2-2024 to 10-2-2024	**UNIT 1:** Growth and decay of current in a circuit with (i) C and R (ii) R and L (iii) L and C (iv) R, L and C A.C circuit analysis using complex variables with (i) C and R (ii) R and L (iii) L and C (iv) R, L and C, Series and parallel resonant circuit, Quality factor, Sharpness of resonance Test of Unit 1
	12-2-2024 to 17-2-2024 19-2-2024 to 24-2-2024 26-2-2024 to 2-3-2024 4-3-2024 to 9-3-2024	**UNIT 2:** Intrinsic and extrinsic semiconductors,P-N junction diode and its V-I characteristics, Resistance of diode Zener diode, Zener diode as voltage regulator Photodiode, LED Solar cell, Half wave and Full wave rectifiers, Filters: L and Pi , Simple regulated power supply Transistors: Working of NPN and PNP transistor (CB, CE and CC) configurations, advantage of CB configuration , C.R.O

	11-3-2024 to 16-3-2024 18-3-2024 to 22-3-2024 25-3-2024 to 31-03-2024	Test of Unit 2 and Assignment **UNIT 3:** Transistor biasing, Methods of biasing, D.C load line, CB and CE transistor biasing CB and CE transistor amplifier, feed-back in amplifiers, advantage of negative feedback, Emitter follower Holi break
	01-4-2024 to 6-04-2024 08-04-2024 to 13-04-2024 15-04-2024 to 31-04-2024 01-05-2024 onwards	Oscillators:Principle, classification, condition of self sustained oscillation, Tuned collector common emitter oscillator, hartley oscillator, Colpitts oscillators Assignments, Viva,Test Revision, External Practical Exam MDU examination

LESSON PLAN- B.Sc 4th SEMESTER

Session: 2023-2024

Name of teacher- Dr. Naveen Kumari, Assistant Professor

Subject- Physics (PHY-401) Statistical Mechanics

CLASS	WEEKS	SYLLABUS
B.Sc 4thSemester	16-1-2024 to 20-1-2024	**UNIT 1:** Probability, some probability considerations, combinations possessing maximum probability, combinations possessing minimum probability
	22-1-2024 to 27-1-2024	Distribution of molecules in two boxes. Case with weightage (general). Phase space, microstates and macrostates
	29-1-2024 to 3-2-2024	Statistical fluctuations constraints and accessible States Thermodynamical probability.
	5-2-2024 to 10-2-2024	Numericals and Test of Unit 1
	12-2-2024 to 17-2-2024	**UNIT 2:** Postulates of Statistical Physics. Division of Phase space into cells, Condition of equilibrium between two systems in thermal contact.
	19-2-2024 to 24-2-2024	beta-Parameter. Entropy and Probability, Boltzman's distribution law. Evaluation of A and B.
	26-2-2024 to 2-3-2024	Bose-Einstein statistics, Application of B.E. Statistics to Planck's radiation law
	4-3-2024 to 9-3-2024	B.E. gas. Test of Unit 2 and Assignment

	11-3-2024 to 16-3-2024	**UNIT 3:** Fermi-Dirac statistics, M.B. Law as limiting case of B.E.
	18-3-2024 to 22-3-2024	Degeneracy and B.E., Condensation. F.D. Gas
	25-3-2024 to 31-03-2024	Holi break
	01-4-2024 to 6-04-2024	electron gas in metals. Zero point energy. Specific heat of metals and its solution.
	08-04-2024 to 13-04-2024	Assignments, Viva,Test
	15-04-2024 to 31-04-2024	Revision, External Practical Exam
	01-05-2024 onwards	MDU examination

LESSON PLAN- B.Sc 4th SEMESTER

Session: 2023-2024

Name of teacher- Dr. Naveen Kumari, Assistant Professor

Subject- Physics (PHY-402) OPTICS (II)

CLASS	WEEKS	SYLLABUS
B.Sc 4th Semester	16-1-2024 to 20-1-2024 22-1-2024 to 27-1-2024 29-1-2024 to 3-2-2024 5-2-2024 to 10-2-2024	**UNIT 1:** Interference by Division of Amplitude :Colour of thin films, wedge shaped film Newton's rings. Interferometers: Michelson's interferometer and its application to (I) Standardisation of a meter (II) determination of wavelength. Fresnel's Diffraction : Fresnel's half period zones, zone plate Diffraction at a straight edge, rectangular slit and circular aperture . Test of Unit 1
	12-2-2024 to 17-2-2024 19-2-2024 to 24-2-2024 26-2-2024 to 2-3-2024 4-3-2024 to 9-3-2024	**UNIT 2:** Fraunhofer diffraction : One slit diffraction, Two slit diffraction. Plane transmission grating spectrum, Dispersive power of a grating , Limit of resolution Rayleigh's criterion, resolving power of telescope and a grating. Numericals , Test of Unit 2 and Assignment

	11-3-2024 to 16-3-2024 18-3-2024 to 22-3-2024 25-3-2024 to 31-03-2024	**UNIT 3:** Polarization :Polarization and Double Refraction : Polarization by reflection, Polarisation by scattering, Malus law Phenomenon of double refraction, Huygen's wave theory of double refraction (Normal and oblique incidence), Analysis of Polarised light : Nicol prism, Quarter wave plate and half wave plate Holi break
	01-4-2024 to 6-04-2024 08-04-2024 to 13-04-2024 15-04-2024 to 31-04-2024 01-05-2024 onwards	Production and detection of (i) Plane polarized light (ii) Circularly polarized light and (iii)Elliptically polarized light, Optical activity, Fresnel's theory of rotation, Specific rotation, Polarimeters (half shade and Biquartz). Assignments, Viva,Test Revision, External Practical Exam MDU examination

LESSON PLAN- B.Sc 6th SEMESTER

Session: 2023-2024

Name of Teacher- Dr. Naveen Kumari, Assistant Professor

Subject- Physics (PHY-601) Atomic, Molecular and Laser Physics

CLASS	WEEKS	SYLLABUS
B.Sc 6thSemester	16-1-2024 to 20-1-2024	**UNIT 1:** Vector atom model, Quantum numbers, penetrating and non penetrating orbits, Spectral lines in different series of Alkali Spectra
	22-1-2024 to 27-1-2024	Spin orbit interaction and double term separation
	29-1-2024 to 3-2-2024	Expression for interaction energy in LS or Russel-saunder coupling
	5-2-2024 to 10-2-2024	Expression for interaction energy in jj coupling Test of Unit 1
	12-2-2024 to 17-2-2024	**UNIT 2:** NormalZeeman effect, Anomalous zeeman Effect
	19-2-2024 to 24-2-2024	Zeeman pattern of D1 and D2 lines of Na atom, Paschen -Back effect of single valence electron system
	26-2-2024 to 2-3-2024	Weak field stark effect of Hydrogen atom, Raman Effect
	4-3-2024 to 9-3-2024	Vibrational and Rotational energies, stoke's and Anti-stoke's lines Test of Unit 2 and Assignment

	11-3-2024 to 16-3-2024 18-3-2024 to 22-3-2024 25-3-2024 to 31-03-2024	**UNIT 3:** Main features of Laser: directionality, high intensity, coherence (Spatial and temporal), Monochromaticity Einstein's coefficients and possibility of amplification, momentum transfer, Life time of a level, Holi break
	01-4-2024 to 6-04-2024 08-04-2024 to 13-04-2024 15-04-2024 to 31-04-2024 01-05-2024 onwards	He-Ne Laser, Ruby Laser, Applications of Laser, Threshold condition for laser emission Assignments, Viva,Test Revision, External Practical Exam MDU examination

LESSON PLAN- B.Sc 6th SEMESTER

Session: 2023-2024

Name of Teacher- Dr. Naveen Kumari, Assistant Professor

Subject- Physics (PHY-602) Nuclear Physics

CLASS	WEEKS	SYLLABUS
B.Sc 6thSemester	16-1-2024 to 20-1-2024	**UNIT 1:** Nuclear mass and binding energy systematics, Nuclear stability
	22-1-2024 to 27-1-2024	Nuclear size, spin, parity, statistics, magnetic dipole and quadrupole moment
	29-1-2024 to 3-2-2024	Determination of mass by Bain-Bridge and Jordan mass spectroscope, determination of charge by Mosley law
	5-2-2024 to 10-2-2024	Determination of size of nuclei by Rutherford Back scattering Test of Unit 1
	12-2-2024 to 17-2-2024	**UNIT 2:** Interaction of alpha particle , disintegration and its theory, Energy loss of heavy charge particle, Energetics of alpha decay, range and straggling,
	19-2-2024 to 24-2-2024	Geiger-nuttal law, interaction of beta particle , Types of Beta decay, Beta decay energetics, Range and absorption of Beta particle
	26-2-2024 to 2-3-2024	Interaction of gamma ray, nature and energetics of Gamma ray, Compton, photoelectric and pair production
	4-3-2024 to 9-3-2024	Electron positron Annihilation, Absorption of gamma rays and its applications Test of Unit 2 and Assignment

	11-3-2024 to 16-3-2024	**UNIT 3:** Nuclear reactions , Elastic scattering, Inelastic scattering, Nuclear disintegration, Photonuclear reactions, Radiative capture
	18-3-2024 to 22-3-2024	Direct reaction , Heavy ion reactions and spallation reactions , Conservation laws, Q-value and reaction threshold
	25-3-2024 to 31-03-2024	Holi break
	01-4-2024 to 6-04-2024	Linear, Tandem accelerator, Cyclotron and Betatron, Ionisation chamber, Proportional, GM, Scintillation Counter, Semiconductor detector
	08-04-2024 to 13-04-2024	Assignments, Viva,Test
	15-04-2024 to 31-04-2024	Revision, External Practical Exam
	01-05-2024 onwards	MDU examination