LESSON PLAN (2019-2020) PHYSICS
(1st SEMESTER ELECTRICITY AND MAGNETISM)

S.No	WEEK	TOPIC	REMARK
1	16 July - 20 July	**Unit II Magnetostatistics** **Introduction**	
2	22 July -26 July	Classification of Magnetic Materials	
3	29 July -03 Aug.	Properties of Magnetic Materials	
4	05 Aug. - 10 Aug.	Electronic theory of dia and para magnetism (Langevin's theory).	
5	12 Aug.-17 Aug.	Domain theory of ferromagnetism	
6	19 Aug. -24 Aug.	Cycle of Magnetisation - Hysteresis (Energy dissipation, Hysteresis loss and importance ofHysteresis curve).	
7	26 Aug. -31 Aug.	Magnetic Induction, magetic flux, solenoidal nature of Vector field of induction.	
8	02 Sept.- 07 Sept.	Properties of B (i) .B = 0 (ii) B= J.	
9	09 Sept. -14 Sept.	**REVISION**	
10	16 Sept. -21 Sept.	**Unit I Electrostatics** . **Mathematical Background** Scalars and Vectors, dot and cross product, Triple vector product,	
11	23 Sept. -28 Sept.	**Mathematical Background :** Scalar and Vector fields, Differentiation of a vector, Gradient of a scalar and its physical significance,	
12	01 Oct.-05 Oct.	**Mathematical Background :** Integration of a vector (line, surface and volume integral)	
13	07 Oct.-12 Oct.	**Mathematical Background** Gauss's divergence theorem and Stocks theorem.	
14	14 Oct. -19 Oct.	**Electrostatic Field:** Derivation of field E from potential as gradient, derivation of Laplace and Poisson equations. Electric flux,	
15	21 Oct.-23 Oct.	**Electrostatic Field** Gauss's Law and its application to spherical shell, uniformly charged infinite plane and uniformity charged straight wire, mechanical force of charged surface, Energy per unit volume	
	24 Oct. -30 Oct.	**DIWALI BREAK**	
16	04 Nov.-09 Nov.	**Unit III Electromagnetic Theory** Maxwell equation and their derivations, Displacement Current. Vector and scalar potentials,	
17	11 Nov.- 16 Nov.	boundary conditions at interface between two different media, Propagation of electromagnetic wave (Basic idea, no derivation). Poynting vector and Poynting theorem	
18	19 Nov. onwards	**EXAMINATION**	
19	20 Dec. -31 Dec.	**WINTER VACATION**	

LESSON PLAN (2019-2020) PHYSICS

MECHANICS 1st SEMESTER

S.No	WEEK	TOPIC	REMARK
1	16 July - 20 July	**UNIT III** Rotation of Rigid body,	
2	22 July -26 July	Torque, angular momentum, kinetic energy of Rotation.	
3	29 July -03 Aug.	Theorems of perpendicular and parallel axes with proof	
4	05 Aug. - 10 Aug.	Moment of inertia of spherical shell, solid cylinder, solid sphere	
5	12 Aug.-17 Aug.	Moment of inertia of, hollow cylinder and solid bar of rectangular cross-section	
6	19 Aug. -24 Aug.	Moment of inertia of, hollow sphere, Acceleration of a body rolling down on an inclined plane	
7	26 Aug. -31 Aug.	**REVISION**	
8	02 Sept.- 07 Sept.	**UNIT II** Generalized coordinates, displacement, velocity	
9	09 Sept. -14 Sept.	Generalized acceleration, momentum, force and potential	
10	16 Sept. -21 Sept.	Hamilton's variational principle, Lagrange's equation of motion from Hamilton's Principle.	
11	23 Sept. -28 Sept.	Linear Harmonic oscillator, simple pendulum, Atwood's machine.	
12	01 Oct.-05 Oct.	**REVISION**	
13	07 Oct.-12 Oct.	**UNIT I** Introduction	
14	14 Oct. -19 Oct.	Mechanics of single and system of particles,	
15	21 Oct.-23 Oct.	conservation laws of linear momentum, angular momentum and mechanical energy for single particle	
	24 Oct. -30 Oct.	**DIWALI BREAK**	DIWALI BREAK
16	04 Nov.-09 Nov.	Conservation laws of linear momentum, angular momentum and mechanical energy for systems of particles.	
17	11 Nov.- 16 Nov.	Centre of mass and equation of motion , Constrained motion, degrees of freedom	
18	19 Nov. onwards	**EXAMINATION**	
19	20 Dec. -31 Dec.	**WINTER VACATION**	

LESSON PLAN SESSION 2019-2020
3rd Sem, Optics I

S.No	WEEK	TOPIC	REMARK
1	16 July - 20 July	**Unit-I** Fourier Analysis and Fourier Transforms.	
2	22 July -26 July	Speed of longitudinal waves in a fluid, superposition of waves (physical idea),	
3	29 July -03 Aug.	Fourier Analysis of complex waves and its application for the solution of triangular and rectangular waves	
4	05 Aug. - 10 Aug.	Fourier Analysis of complex waves and its application for the solution of triangular and rectangular waves	
5	12 Aug.-17 Aug.	half and full wave rectifier out puts.	
6	19 Aug. -24 Aug.	Fourier transforms and its properties. Application of fourier transform	
7	26 Aug. -31 Aug.	**REVISION**	
8	02 Sept.- 07 Sept.	**Unit-II** Geometrical Optics : Matrix methods in paraxial optics,	
9	09 Sept. -14 Sept.	effects of translation and refraction,	
10	16 Sept. -21 Sept.	derivation of thin lens and thick lens formulae	
11	23 Sept. -28 Sept.	unit plane, nodal planes	
12	01 Oct.-05 Oct.	system of thin lenses,	
13	07 Oct.-12 Oct.	Chromatic, spherical coma, astigmatism and distortion aberrations and their remedies.	
14	14 Oct. -19 Oct.	Chromatic, spherical coma, astigmatism and distortion aberrations and their remedies.	
15	21 Oct.-23 Oct.	**Unit-III** Interference : Fresnel's Biprism and its applications to determination of wave length of sodium light	
	24 Oct. -30 Oct.	**DIWALI BREAK**	DIWALI BREAK
16	04 Nov.-09 Nov.	Fresnel's Biprism and its applications to determination of thickness of a mica sheet	
17	11 Nov.- 16 Nov.	Lioyd's mirror, phase change on reflection	
18	19 Nov. onwards	**EXAMINATION**	
19	20 Dec. -31 Dec.	**WINTER VACATION**	

LESSON PLAN SESSION 2019-2020 3rd Sem, CPT			
S.No	**WEEK**	**TOPIC**	**REMARK**
1	16 July - 20 July	**Unit-II** Thermodynamics-I : Second law of thermodynamics, Carnot theorem,	
2	22 July -26 July	Absolute scale of temperature, Absolute Zero,	
3	29 July -03 Aug.	Entropy, show that dQ/T=O, T-S diagram	
4	05 Aug. - 10 Aug.	Liquefication of gases	
5	12 Aug.-17 Aug.	Joule's free expansion, Joule Thomson (Porous plug) experiment. Joule - Thomson effect	
6	19 Aug. -24 Aug.	.. Air pollution due to internal combustion Engine	
7	26 Aug. -31 Aug.	**REVISION**	
8	02 Sept.- 07 Sept.	**Unit-III** Thermodynamics-II : Derivation of Clausius - Claperyron latent heat equation	
9	09 Sept. -14 Sept.	Phase diagram and triple point of a substance	
10	16 Sept. -21 Sept.	Development of Maxwell thermodynamical relations	
11	23 Sept. -28 Sept.	Application of Maxwell relations in entropy, specific heats and thermodynamic variables	
12	01 Oct.-05 Oct.	Application of Maxwell relations in entropy, specific heats and thermodynamic variables	
13	07 Oct.-12 Oct.	Thermodynamic functions and the relations between them	
14	14 Oct. -19 Oct.	Thermodynamic functions and the relations between them	
15	21 Oct.-23 Oct.	**Unit-I** Computer Programming : Binary representation,	
	24 Oct. -30 Oct.	DIWALI BREAK	DIWALI BREAK
16	04 Nov.-09 Nov.	Algorithm development, flow charts and their interpretation	
17	11 Nov.- 16 Nov.	Fortran Preliminaries; Integer and floating point arithmetic expression, built in function input and output statements, Formats, I.F. DO and GO TO statements, Dimesion arrays.	
18	19 Nov. onwards	**EXAMINATION**	
19	20 Dec. -31 Dec.	**WINTER VACATION**	

LESSON PLAN SESSION 2019-2020
5th Sem, Quantum

S.No	WEEK	TOPIC	REMARK
1	16 July - 20 July	**Unit-I**, photoelectric effect and	
2	22 July -26 July	Einsteins photoelectric equation	
3	29 July -03 Aug.	compton effect (theory and result).	
4	05 Aug. - 10 Aug.	de-Broglie hypothesis. Davisson and Germer experiment	
5	12 Aug.-17 Aug.	G.P. Thomson experiment. Phase velocity group velocity	
6	19 Aug. -24 Aug.	,Heisenberg's uncertainty principle	
7	26 Aug. -31 Aug.	Time-energy and angular momentum, Uncertainty principle from de-Broglie wave, (wave-partice duality).	
8	02 Sept.- 07 Sept.	**REVISION**	
9	09 Sept. -14 Sept.	**Unit-II** Derivation of time dependent Schrodinger wave equation	
10	16 Sept. -21 Sept.	eigen values, eigen functions wave functions and its significance.	
11	23 Sept. -28 Sept.	Normalization of wave function, concept of observable and operator	
12	01 Oct.-05 Oct.	Solution of Schrodinger equation for harmomic oscillator ground states and excited states.	
13	07 Oct.-12 Oct.	Solution of Schrodinger equation for harmomic oscillator ground states and excited states.	
14	14 Oct. -19 Oct.	**REVISION**	
15	21 Oct.-23 Oct.	**Unit-III** Free particle in one dimensional box, One-dimensional potential barrier $E>V_0$ (Reflection and Transmission coefficient	
	24 Oct. -30 Oct.	DIWALI BREAK	DIWALI BREAK
16	04 Nov.-09 Nov.	One-dimensional potential barrier $E>V_0$ (Reflection and Transmission coefficient	
17	11 Nov.- 16 Nov.	One-dimensional potential barrier, $E>V_0$ (Reflection Coefficient, penetration of leakage Coefficient, penetration depth).	
18	19 Nov. onwards	**EXAMINATION**	
19	20 Dec. -31 Dec.	**WINTER VACATION**	

LESSON PLAN SESSION 2019-2020
5th Sem, Solid State Physics

S.No	WEEK	TOPIC	REMARK
1	16 July - 20 July	**Unit-I** Crystalline and gallssy forms, ,	
2	22 July -26 July	liquid crystals. Crystal structure	
3	29 July -03 Aug.	periodicity, lattice and basis, crystal translational vectors and axes.	
4	05 Aug. - 10 Aug.	Unit cell and primitive cell, Winger Seitz primitive Cell,	
5	12 Aug.-17 Aug.	symmetry operations for a two dimensional crystal	
6	19 Aug. -24 Aug.	Bravais tattices in two and three dimensions.	
7	26 Aug. -31 Aug.	**REVISION**	
8	02 Sept.- 07 Sept.	**Unit-II** crystal planes and Miller indices	
9	09 Sept. -14 Sept.	Interplanner spacing	
10	16 Sept. -21 Sept.	Crystal structures of Zinc sulphide	
11	23 Sept. -28 Sept.	Sodium Chloride and diamond,	
12	01 Oct.-05 Oct.	X-ray diffraction, Bragg's Law	
13	07 Oct.-12 Oct.	experimental x-ray diffraction methods, K-space.	
14	14 Oct. -19 Oct.	**REVISION**	
15	21 Oct.-23 Oct.	**Unit-III** Reciprocal lattice and its physical significance, reciprocal lattice vectors, reciprocal lattice to simple cubic lattice, b.c.c and f.c.c.	
	24 Oct. -30 Oct.	DIWALI BREAK	DIWALI BREAK
16	04 Nov.-09 Nov.	Specific heat of solids Einstein's theory of specific heat	
17	11 Nov.- 16 Nov.	Debye model of specific heat of solids	
18	19 Nov. onwards	**EXAMINATION**	
19	25 Nov.-30 Nov.	**WINTER VACATION**	

LESSON PLAN SESSION 2019-2020 Paper I- PHY 201 : PROPERTIES OF MATTER, KINETIC THEORY AND RELATIVITY Sem. 2nd		
S.No	**WEEK**	**TOPIC**
1	01.01.2020-04.01.2020	**Unit - I** **Properties of Matter (Elasticity) :** Elasticity, Hooke's law, Elastic constants and
2	06.01.2020-11.01.2020	Relations between Elastics constants, Poisson's ratio
3	13.01.2020-18.01.2020	Torsion of cylinder and twisting couple
4	20.01.2020-25.01.2020	Bending of beam (bending moment and its magnitude) cantilevers Centrally loaded beam
5	27.01.2020-31.01.2020	**Unit - II** **Kinetic Theory of Gases:** Assumptions of Kinetic Theory of gases, Law of equipartition of energy and its applications for specific heats of gases.
6	03.02.2020-08.02.2020	Maxwell distribution of speeds and velocities (derivation required)
7	10.02.2020-15.02.2020	Experimental verification of Maxwell's Law of speed distribution : most probable speed, average and r.m.s. speed, mean free path.
8	17.02.2020-22.02.2020	Transport of energy and momentum, diffusion of gases.
9	24.02.2020-29.02.2020	Brownian motion (qualitative),Real gases, Van der Waal's equation
10	02.03.2020-07.03.2020	**Unit - III** **Theory of Relativity :** Reference systems, inertial frames, Gallilean invariance and Conservation laws,
11	08.03.2020-15.03.2020	**HOLI BREAK**
12	16.03.2020-21.03.2020	Newtonian relativity principle
13	23.03.2020-28.03.2020	Michelson - Morley experiment
14	01.04.2020-04.04.2020	Search for ether. Lorentz transformations length contraction
15	06.04.2020-11.04.2020	Lorentz transformations, time dilation, velocity
16	13.04.2020-18.04.2020	Test
17	20.04.2020-25.04.2020	Addition theorem,
18	27.04.2020-30.04.2020	Variation of mass with velocity and mass energy equivalence
19	01.05.2020 onwards	examination
20	20.05.2020-30.06.2020	Summer Vacation

LESSON PLAN SESSION 2019-2020 Paper I- PHY 401 : Statistical Mechanics Semester IV		
S.No	**WEEK**	**TOPIC**
1	01.01.2020-04.01.2020	**Unit-I** Probability, some probability considerations, combinations possessing maximum probability
2	06.01.2020-11.01.2020	combinations possessing minimum probability, distribution of molecules in two boxes
3	13.01.2020-18.01.2020	Case with weightage (general). Phase space,
4	20.01.2020-25.01.2020	Microstates and macro states, statistical fluctuations constraints and accessible States Thermo dynamical probability.
5	27.01.2020-31.01.2020	**Unit-II** Postulates of Statistical Physics. Division of Phase space into cells,
6	03.02.2020-08.02.2020	Condition of equilibrium between two systems in thermal contact. B-Parameter. Entropy
7	10.02.2020-15.02.2020	Probability, Boltzmann's distribution law Evaluation of A and b.
8	17.02.2020-22.02.2020	Bose-Einstein statistics,
9	24.02.2020-29.02.2020	Application of B.E. Statistics to Planck's radiation law
10	02.03.2020-07.03.2020	B.E. gas.
11	08.03.2020-15.03.2020	**HOLI BREAK**
12	16.03.2020-21.03.2020	**Unit-III** Fermi-Dirac statistics,
13	23.03.2020-28.03.2020	M.B. Law as limiting case of B.E
14	01.04.2020-04.04.2020	Degeneracy and B.E.,
15	06.04.2020-11.04.2020	Test
16	13.04.2020-18.04.2020	Condensation. F.D. Gas
17	20.04.2020-25.04.2020	Electron gas in metals. Zero point energy
18	27.04.2020-30.04.2020	Specific heat of metals and its solution
19	01.05.2020 onwards	examination
20	20.05.2020-30.06.2020	Summer Vacation

LESSON PLAN SESSION 2019-2020 Paper I- PHY 601 : ATOMIC MOLECULAR AND LASER PHYSICS Semester -VI		
S.No	**WEEK**	**TOPIC**
1	01.01.2020-04.01.2020	**Unit -I** Vector atom model, quantum numbers associated with vector atom model,
2	06.01.2020-11.01.2020	penetrating and non-penetrating orbits (qualitative description)
3	13.01.2020-18.01.2020	spectral lines in different series of alkali spectra
4	20.01.2020-25.01.2020	spin orbit interaction and doublet term separation LS or Russel-Saunder Coupling jj coupling
5	27.01.2020-31.01.2020	Expressions for interaction energies for LS and jj coupling required
6	03.02.2020-08.02.2020	Test
7	10.02.2020-15.02.2020	**Unit-II** Zeeman effect (normal and Anomalous) Zeeman pattern of D1 and D2 lines of Na-atom
8	17.02.2020-22.02.2020	Paschen, Back effect of a single valence electron system. Weak field Stark effect of Hydrogen atom.
9	24.02.2020-29.02.2020	Raman effect (Quantitative description)
10	02.03.2020-07.03.2020	Stoke's and anti Stoke's lines.
11	08.03.2020-15.03.2020	**HOLI BREAK**
12	16.03.2020-21.03.2020	**Unit-III** Main features of a laser : Directionality, high intensity, high degree of coherence, spatial and temporal coherence
13	23.03.2020-28.03.2020	Einstein's coefficients and possibility of amplification, momentum transfer
14	01.04.2020-04.04.2020	life time of a level, kinetics of optical absorption
15	06.04.2020-11.04.2020	Threshold condition for laser emission, Laser pumping,
16	13.04.2020-18.04.2020	. He-Ne laser and RUBY laser (Principle, Construction and Working).
17	20.04.2020-25.04.2020	Applications of laser in the field of medicine and industry
18	27.04.2020-30.04.2020	**REVISION**
19	01.05.2020 onwards	**EXAMINATION**
20	20.05.2020-30.06.2020	**SUMMER VACATION**