Maharaja Ranjit Singh College of Professional Sciences, Indore

Department of Physics

Lesson Plan - B.Sc. IV Sem (Jan 2017 - May 2017)

Subject - Physics

Teacher - Prof. Mahima Jain/ Prof. Sudeep Sharma

Day/Lecture	Unit	Topic
1	1 Electrostastics	Coulomb`s law in vaccum expressed in vector form
2		calculation of electric field E for simple distribution of charge at rest
3		Dipole and quadrapole fields.
4		Work done on a charge in an electrostatic field expressed as a line integral.
5		conservative nature of the electrostatic field
6		relation between electric field and electric potential
7		Torque on a dipole in a uniform electric field and its energy, flux of the electric field.
8		Gauss`s law and its application for finding E for symmetric charge distribution.
9		Capacitors, coducting sphere in a uniform eletric field
10		point charge in front of a grounded infinite conductor.
11		Dielectrics, parallel plate capacitor with a dielectric, dielectric constant.
12		Polarisation and polarisation vector P
13		relation between displacement vector D,E and P
14		Molecular interpretation of Claussius-Mossotti equation.
15	2 Magnetostatics	Force on a moving charge.
16		Lorentz force equatiion and definition of B
17		force on a straight conductor carrying current in a uniform magnetic field.
18		Torque on a current loop, magnetic dipole moment.
19		Angular momentum and gyromagnetic ratio.
20		Biot and Savart`s law
21		calculation of H for simple geometrical situations such as solenoid.
22		Anchor ring, Ampere`s law,
23		Curl B = μ.J div B = 0, field due to a magnetic dipole, free and bound currents

24		Magnetisation vector (M), relationship between B,H and M
25		Derivation of the relation Curl M = J for non uniform magnetisation
26	3	Steady current, current density J, non-steady currents and continuity equation
27	Current elctricity and Bioelectricity	Kirchoff's laws and analysis of multi loop circuits
28		Growth and decay of current in LR and CR circuits
29		Decay constants
30		LCR circuits
31		AC circuits
32		Complex numbers and their applications in solving AC circuits problems
33		Complex impedence and reactance
34		Series and parallel resonance, Q-factor
35		Power consumed by an AC circuits, power factor
36		Y and Delta networks and transmission of electric power
37		Electricity observed in living systems
38		Origin of bioelectricity
39	4	E as an accelerating field
40	Motin of charged particles in Electric and MagneticFields	Electron gun
41		Discharge tube, linear accelerating
42		E as deflecting field- CRO
43		Sensitivity of CRO
44		Transverse B field, 180° deflection
45		Mass spectrograph and velocity selector
46		Curvatures of tracks for energy determination for nuclear particles
47		Principle and working of Cyclotron
48		Mutually perpendicular and parallel E and B fields

49		Positive ray parabolas, discovery of isotopes
50		Elements of mass spectrographs
51		Principle of magnetic focussing (lenses)
52	5 Electrodynamics	Electromagnetic Induction, Faraday's Laws
53		Electromotive force, integral and diffrential forms of Faraday's laws
54		Self and mutual inductance
55		Teansformers, energy in a static magnetic field
56		Maxwell's displacement current
57		Derivations of Maxwell's equations
58		Electromagnetic field energy density
59		Poynting vector
60		Electromagnetic wave equations
61		Plane electromagnetic waves in vaccum and dielectric media
62		Reflection at a plane boundary of dielectrics
63		Fresnel's law
64		Polarisation by reflection and total internal reflection
65		Waves in a conducting medium
66		Reflection and refraction by the ionosphere

Maharaja Ranjit Singh College of Professional Sciences, Indore

Department of Physics

Lesson Plan - B.Sc IV SEM (Jan2017- May 2017)

Subject - Physics Practical

Teacher - Prof. Mahima Jain/Prof.Sudeep Sharma

S. N.	**Name of practical**
1	To verify Maximum Power Transfer theorem .
2	To verify Millman's theorem .
3	To verify Superposition theorem .
4	To verify Reciprocity theorem .
5	To determine inductance of choke coil .
6	To study charging and discharging of capacitor .
7	To study impedance and powerfactor of LCR circuit .
8	To draw the characteristics of microphone.
9	To study the intensity of sound wave with distance.
10	Measurement of inductance at different frequencies.
11	Measurement of capacitance at different frequencies.

Maharaja Ranjit Singh College of Professional Sciences, Indore

Department of Physics

Lesson Plan - B.Sc. V Sem (July 2016 - Dec 2016)

Subject - Physics

Teacher - Prof. Mahima Jain/ Prof. Sudeep Sharma

Day/Lecture	Unit	Topic
1	1 Quantum Mechanics-I	Photo electric effect
2		Black body radiation
3		Compton effect
4		De-Broglie hypothesis
5		Wave Particle duality,Davisson-Germer experiment
6		Wave packets,Concept of phase and group velocity
7		Two slit experiment with electrons,probability
8		Wave amplitude and wave functions
9		Heisenberg's uncertainity principle with illustrations
10		Basic postulates and formalism of Schrondinger's equation
11		Eigen values
12		Probablistic interpretation of wave function
13		Equation of continuity
14		Probability current density
15		Boundary condition on the wave function
16		Normalization of wave function
17	2 Quantum Mechanism-II	1-D potential well
18		1-D potential barrier
19		Boundary conditions,Bound and unbound state
20		Reflection coefficients for a rectangular barrier in one dimension

21		Transmission coefficients for a rectangular barrier in one dimension
22		Explanation of alpha decay
23		Quantum phenomenon of tunneling
24		Free particle in 1-D box
25		Eigen functions of a free particle
26		Eigen values of a free particle
27		1-D simple harmonic oscillator
28		Energy eigen values from Harmite differential equation
29		Wave function for ground state
30		Particle in spherical symmetric potential
31		Rigid rotator
32	3	Atoms in electric and magnetic fields
33	Atomic Spectroscopy	Quantum numbers, Bohr model
34		Selection rules, Stern-Gerlach experiment
35		Spin as an intrinsic quantum number
36		Incompatibility of spin with classical ideas
37		Orbital angular momentum
38		Fine structure, total angular momentum
39		Pauli's exclusion principle
40		Many particles in a 1-D box

41		Symmetric and anti symmetric wave functions
42		Atomic shell moddel
43		Spectral notations for atomic states
44		Spin -orbit coupling
45		L-S and j-j coupling
46		Zeeman's effect
47		Continuous and characteristic X-rays
48		Mosley's law
49	4	Various types of spectra, rotational spectra
50	Molecular spectroscopy	Intensity of spectral lines
51		Determination of bond distance of diatomic molecules, isotope effect
52		Vibrational energies of diatomic molecules
53		Zero point energies, anharmonicity
54		Morse potential
55		Raman effect, Stoke's and anti-stoke's line and their intensity difference
56		Electronic spectra, Born-Oppenheimer approximantion
57		Franck-Condon principle
58		Singlet and triplet states
59		Fluorescence and phosphorescence

60	5	Basic properties of nucleus,shape,size,mass and charge of the nucleus
61	Nuclear Physics	Stability of the nucleus and binding energy
62		Alpha particles spectra-velocity and energy of alpha particles
63		Geiger-Nuttall law, nature of beta ray spectrum
64		The nutrino, energy levels and decay schemes, positron emissions and electron capture
65		Selection rules, beta absorption and range of beta particles
66		Kurie plot, nuclear reactions, pair production
67		Q-values and threshold of nuclear reactions, nuclear reaction cross-sections
68		Examples of different types of reactions and their characteristics
69		Compound nucleus, Bohr's poastulate of compound nuclear reaction
70		Semi empirical mass formula
71		Shell model, liquid drop model
72		Nuclear fission and fusion (concepts)

Maharaja Ranjit Singh College of Professional Sciences, Indore

Department of Physics

Lesson Plan - B.Sc.V sem (July 2016 - Dec2016)

Subject - Physics Practical

Teacher - Prof. Mahima Jain/Prof. Sudeep Sharma

S.N.	**Name of Practical**
1	To determine the Planck's constant
2	Determination of e/m using Thomson's method
3	To draw the B-H curve with the help of CRO and find its area.
4	To study the half wave rectifier.
5	To study the full wave rectifier.
6	To study variation of megnetic field with distance
7	To determine megnetic moment of megnet (M) with the help of vibration megnetometer.
8	To determine Horizontal component of earth (H) with the help of vibration megnetometer and tangent galvanometer.
9	To determine the value of Stefan's constant.
10	To draw the Thermistor characteristics.

Maharaja Ranjit Singh College of Professional Sciences, Indore

Department of Physics

Lesson Plan - B.Sc. VI Sem (Jan 2017 - May 2017)

Subject - Physics

Teacher - Prof. Mahima Jain/ Prof. Sudeep Sharma

Day/Lecture	Unit	Topic
1	1	Crystalline and amorphous solids
2	Solid State	Translational symmetry
3	Physics-I	Lattice and Basis
4		Unit cell ,reciprocal lattice
5		Fundamental types of lattice (Bravias lattice)
6		Miller Indices,lattice plane
7		Simple cubic,face centered cubic
8		Body centered cubic lattices
9		Laue and Bragg's equations
10		Determination of crytal structure with X-rays
11		X-ray spectrometer
12		Ionic,covalent,metallic
13		Vander waals and hydrogen bonding
14		Band theory of solids
15		Periodic potential and Bloch therorem

16			Kronig-Penny model
17	2		Dulong-Petit theory of specific heat of solids
18	Solid State		Einstein's theory of specific heat of solids
19	Physics-II		Debye theory of specific heat of solids
20			Elastic and atomic force constants
21			Dynamic of a chain of similar atoms and chain of two types of atoms
22			Optical and acoustic modes
23			Electrical resistivity, specific heat of electron
24			Wiedemann-Franz law
25			Hall effect
26			Response of substance in diamagnetic field material
27			Response of substance in paramagnetic field material
28			Response of substance in ferromagnetic field material
29			Classical Langevin theory of diamagnetic domains
30			Classical Langevin theory of paramagnetic domains
31			Curie's law, Weiss's theory of ferromagnetism domains
32			Weiss's theory of ferromagnetic domains

33		Discussion of B-H hysterisis
34	3	Types of semiconductor (p and n)
35	Semiconductor	Formation of energy bands
36	Devices-I	Energy level diagram
37		Conductivity and mobility
38		Junction formation,Barries formation in p-n junction diode
39		Current flow mechanism in forward and reverse biased diode
40		Drift and saturation of drift velocity
41		Derivation of mathematical equations for Barrier potential and barrier width
42		Single p-n junction devices and its physical explanation
43		Current voltage and characteristics of single p-n junction device and its application
44		Two terminal devices
45		Rectification,Zener diode,Photo diode
46		Light emitting diode,Solar cell
47		Three terminal devices,junction field effect transistor(JFET)
48		Two junction devices,transistor as p-n-p and n-p-n
49		Physical mechanism of current flow
50		Characteristics of transisator
51	4	Amplifiers,CB configurations

52	Semiconductor	CE and CB configurations
53	Devices-II	Single stage CE amplifier
54		Q-point equivalent circuit
55		Input impedance and output impedance
56		Volatge and current gain,Class A,B,C amplifiers
57		R-C coupled amplifier
58		Class B push pull amplifiers,feedback amplifiers
59		Voltage feedback and current feedback
60		Effect of negative voltage series feedback on input and output impedance and gain
61		Stability, destrotion and noise
62		Principle of an oscillator,Bark-Hausen criterion
63		Colpitts,R-C phase shift oscillators
64		Basic concepts of amplitude
65		Frequency and phase,modulations amd demodulation
66	5	Introduction to nano technology
67	Nano Material	Structure and size dependent particles
68		3-D,2-D,1-D,0-D nano structure materials and their density of states
69		Surface and interface effects
70		Modelling of quantum size effect
71		Synthesis of nano particles-bottom up and top down approach
72		Wet chemical method
73		Nano lithography
74		Metal and semiconducting nano materials
75		Naturally occuring nano crystals
76		Applications of nano materials

Maharaja Ranjit Singh College of Professional Sciences, Indore

Department of Physics

Lesson Plan - B.Sc.VI sem (Jan2017- May 2017)

Subject - Physics Practical

Teacher - Prof. Mahima Jain/Prof. Sudeep Sharma

S. N.	Name of Practicals
1	To draw the characreristics of Silicon and Germanium diode .
2	To draw the characreristics of Zener diode .
3	To draw the characteristics of Light Emitting Diode .
4	To draw the characteristics of Tunnel Diode .
5	To draw the characteristics of regulated power supply using Zener Diode .
6	To draw the characteristics of regulated power supply using Transistor .
7	To draw the characteristics of unregulated power supply .
8	To determine Band gap of semiconductor diode .
9	To determine Planck's constant .
10	To draw input characteritics of NPN transistor in CE mode
11	To draw output characteritics of NPN transistor in CE mode
12	To draw output characteritics of PNP transistor in CE mode
13	To draw input characteritics of PNP transistor in CE mode
14	To draw the characteristics of Field Effect Transistor.

Maharaja Ranjit Singh College of Professional Sciences, Indore

Department of Physics

Lesson Plan - B.Sc. I Sem (July 2016 - Dec 2016)

Subject - Physics

Teacher - Prof. Mahima Jain/Prof. Sudeep Sharma

Day/Lecture	Unit	Topic
1	1	Scalar and vector physical quantities,Representation of a vector,Graphical reperesentation of a vector.
2	Mathematical	Some specific vector,unit vector,Zero vector,position vector,displacement vector,Polar vector,axial vector.
3	Physics	Addition of vector,law of triangle of addition of vector,law of parallelogram of vector addition.
4		Equivalence of triangle law with parallelogram law of vector addition.
5		Magnitude and directions of resultant vector by the law of parallelogram of addition.
6		Polygon law of addition of more then two vector,properties of vector addition,subtraction of vector.
7		Resolution of a vector,resolution of a 2-D vector,resolution of a 3-D vector.
8		Product of a vertor with ascalar,product of two vector,Dot or scalar product cross or vector product.
9		Product of three vector,scalar triple product,vector triple product.
10		Product of four vector,scalar and vector feld.
11		Differentiation of vector,line,surface and volume integrals.
12		Repeated integal of a function of more than one variable,unit radial and tangential or normal vector.

13		Laplacian operator,vector intergration,line,surface and volume integral.
14		Gradient of a scalar field,physical significance of gradient,divergence of a vector field.
15		Physical signidicance of divergence ,Gauss divergence theorem,Green's theorem.
16		Curl of a vector field,physcical significance of curl,stoke's theorem,solved examples.
17	2	State of rest and state of motion,distance and displacement,speed and velocity,accelaration and retardation,position velocity and acceleration vector.
18	Mechanics	Different coordinate system,cartesian coordinate system,plane polar coordinate system.
19		Spherical and cylindrical coordinate system velocity and acceleration in different coordinate system.
20		Newton's first,second and third law of motion,limitation of newton's laws,different forces in nature,gravitational ,electromagnetic,nuclear and weak force
21		Inertial frame of reference,non inertial frame of reference,pseudo or fictitious force.
22		Coriolis force and its applications.
23		Equation of motion for a system of single particle,two particles and n-particles.
24		Centre of mass,motion of centre of mass
25		Central force and its propeties,motion of a system of two particles under a central force,concept of reduced mass.
26		Kepler's laws,derivation of first law of kepler.
27		Derivation of kepler's second and third law,derivation of law of gravitation frm kepler's law,gravitational law and gravitational field.
28		Gravitational potential energy and gravitational potential,relationship between gravitational force and gravitational potential energy,gravitational potential.
29		Gravitational potential and intensity of gravitational field due to a uniform spherical shell.
30		Gravitational potential and intensity of gravitational field due to a uniform solid sphere.

31		Gauss theroem in gravitation,gauss and poisson's equation,gravitational self energy,gravtational self energy of a uniform spherical shell and solid sphere.
32		Elastic and inelastic collisions,elastic in a laboratory frame.
33		Elastic collision in a centre of mass frame,Inelastic collsion,
34	3	Elasticity,effect of temperature and impurities on elasticity of a substance;stress and strain;hook's law.
35	General	Elasctic constants for an isotropic solid,young's modulus,steel is more elastic than rubber,to compare the elasticity of two substances;Bulk Modulus.
36	Properties of	Two bulk modulii of a gas,isothermal elasticity and adiabatic elasticity,Modulus of rigidity.
37	Matter	Poission's ratio;workdone in linear strain,volume strain and shear strain.
38		Relationship amongst the various elastic modulii;limiting value of poission's ratio,
39		Bending of beam and bending moment.
40		Cantilever;transverse oscillations of a cantilever;A beam supported at its ends and loaded in the middle,steel girders are of cross section.
41		Determination of Young's Modulus Y of material of beam by bending method,(1)By spherometer, (2)By optical lever Koenig arrangement.
42		Surface tension,explanation of surface tension on the bases of inter molecular forces,surface energy.

43		Angle of contact,effect of angle of contact,capillarity;energy required to raise a liquid in a capilliary tube ;effect of temperature and impurities on the surface tension.
44		Determination of a surface tenison of a liquid (1)By rise in a capillarity tube;(2) By Jaeger's method;applications of surface tension.
45		Ideal and viscous fluids;concept of viscous force and coefficient of viscocity;effect of pressure and temperature on the coefficient of viscocity.
46		Streamlne and turbolent flow;Reynold's number;equation of continuity;energy of a flowing fluid.
47		Bernoulli's theorem;applications based on bernilli's theorem (1) Velocity of efflux or toricelli's theorem.
48		Venturimeter,Aspirator pump,Change of plane of spinning ball or magnus effect,shape of the wings of an aeroplane,atomiser,dancing of ping pong ball on a water fountain.
49	4	Vibrational, periodic and simple harmonic motions,relationship between the period of vibration and frequency,conditions of simple harmonic motion.
50	Oscillations	Differential equations od simple harmonic oscillator and its solutions;Graphical representation of simple harmonic motion,displacement,velocity,acceleration of a particle in a simple harmonic motion.
51		Potential and kinetic energies in simple harmonic motion,average kinetic energy,average potential energy,graphical representation of potential energy and kinetic energy.
52		Oscillations of a mass connected with a spring; oscillastion of two masses connected at a end of massless spring.
53		Rigid body;transplatory and rotatory motion; rotatory motion of a rigid body,equations of rotational motion of a particle under a constant angular acceleration.
54		Newton's law of motion in rotational motion,work and power in rotational motion;M.I. and its physical significance,distinction between inertia and M.I.,application of moment of inertia in daily life;radius of gyration.
55		Rotational kinetic energy in angular momentum,relationship between the angular momentum and rotational kinetic energy; principle of conservation of angular momentum.
56		Theorem of addition,theorem of perpendicular axis,theorem of parallel axis; calculation of moment of inertia of some regular and uniform bodies (1) Momentum of inertia of a uniform thin rod.
57		Momentum of inertia of a uniform rectangular lamina,uniform thin ring,uniform circular disk,uniform solid sphere,uniform hollow sphere.
58		Momentum of inertia of a uniform thick spherical shell,uniform solid cylinder,uniform hollow cylinder,thick cylindrical shell or flywheel.
59		Principal moment of inerti and principal axis,product of inertia,Euler's equations for motion of a rigid body.
60	5	Galilean transformations.
61	Relativistic	Michaelson-Morley's experiment.
62	Mechanics	Concept of special theory of relativity,Lorentz transformations,invariance of space time interval between the two events.
63		Contraction in a length,time dimension;simaltaneity of events and order of events.
64		Relativistic transformation of velocities, frequency and wave number.
65		Relativistic addition of velocities;variation of mass with velocity.
66		Mass-energy equivalence,relationship between relativistic energy and relativistic momentum,particle with zero rest mass.
67	Earlier Developments	Aryabhatt,Archimedes,Nicolas,Coppernicus,Galileo galilei,Huygens,Robert Hooks,Toricelli,Pierre Verneir,Pascal and Keplers.
68	in Physics up to	Newton,Boyle,Young,Thomson,Coulomb,Ampere,Gauss,
69	18th Century	Biot-Savarts,Cavendish,Galvani,Franklin,Bernoulli.

Maharaja Ranjit Singh College of Professional Sciences, Indore

Department of Physics

Lesson Plan - B.Sc.I Sem (July 2016- Dec2016)

Subject - Physics Practical

Teacher - Prof. Mahima Jain/Prof.Sudeep Sharma

S. N.	Name of Practicals
1	To determine radius and diameter of one rs. two rs. and five rs. Coins .
2	To determine radius and diameter of different type of wires .
3	To detrmine modulus of rigidity of wire with the help of Torisional pendulum .
4	To detrmine modulus of rigidity of wire with the help of Maxwell"s needle .
5	To detrmine modulus of rigidity of wire with the help of Inertia table
6	To determine moment of inertia of irregular body with the help of regular body .
7	To verify perpendicular axes theorem .
8	To determine Young's modulus of rigidity of Cantelever beam .
9	To determine acceleration due to gravity with the help of simple pendulum .
10	To determine acceleration due to gravity with the help of bar pendulum .
11	To determine Poisson's ratio of rubber .
12	To determine coefficient of viscosity of glycerene with the help of Stoke's method .

Maharaja Ranjit Singh College of Professional Sciences, Indore

Department of Physics

Lesson Plan - B.Sc. II Sem (Jan 2017 - May 2017)

Subject - Physics

Teacher - Prof. Mahima Jain/Prof. Sudeep Sharma

Day/Lecture	Unit	Topic
1	1	Reversible and irreversible process
2	Thermodynamics-I	Heat engine
3		definition of efficiency, Carnot`s ideal heat engine
4		Carnot`s cycle, effective way to increase efficiency
5		Effective way to increase Carnot`s engine and refrigerator
6		Coefficient of performance
7		Second law of thermodynamics
8		Various statement of second of second law of thrmodynamics
9		Carnot`s theorem
10		Clapeyron`s latent heat equation.
11		Carnot`s cycle and its application
12		Steam engine
13		Otto engine
14		Diesel engine
15	2	Concept of entropy
16	Thermodynamics-II	Change in entropy in adiabatic process
17		Change in entropy in reversible cycle
18		Principle of increase of entropy
19		Change in entropy in irreversible process
20		T-S diagram, physical significance of entropy
21		Entropy of a perfect gas
22		Kelvin`s thermodynamic scale of temperature
23		The size of zero degree, Zero of absolute scale
24		Identity of a perfect gas scale and absolute scale
25		Third law of thermodynamics, zero point energy
26		Negative temperature, Heat death of the universe.
27		Relation between thermodynamic variables (Maxwell`s relation)
28		Relation between thermodynamic variables (Maxwell`s relation)
29	3	Significance of ststistical approach
30	Statistical	Particle-states, System-states

31	Physics-I	Micro-states and Macro-states of the system
32		Equilibrium states, Fluctuations
33		Classical and statistical probability
34		The equi-probability postulate
35		Statistical ensemble
36		Number of states accessible to a system
37		Phase space
38		Micro canonical ensemble
39		canonical ensemble
40		Helmholtz free energy, Enthalpy
41		First law of thermodynamics
42		Gibbs free energy
43		Grand canonical ensemble
44	4	Phase space
45	Statistical	The probability of a distribution
46	Physics-II	The most probable distribution and its narrowing with increase in number of particles
47		Maxwell-Boltzmann statistics
48		Molecular speed distribution and mean, r.m.s. and most probable velocity
49		Constraints of accessible and inaccessible states
50		Partition function, relation between partition function and entropy
51		Bose-Einstein statistics
52		Black-body radiation
53		The Rayleigh-Jeans formula
54		The Planck radiation formula
55		Fermi-Dirac statistics
56		Comparison of result
57		Concept of phase transitions
58	5	S.N. Bose, M.N. Saha
59	Contribution of	Maxwell, Clausius, Boltzmann
60	Physicists	Joule, Wien, Einstein
61		Planck, Bohr
62		Heisenberg, Fermi
63		Dirac, Max Born, Bardeen

Maharaja Ranjit Singh College of Professional Sciences, Indore

Department of Physics

Lesson Plan - B.Sc.II Sem (Jan 2017- May2017)

Subject - Physics Practical

Teacher - Prof. Mahima Jain/Prof.Sudeep Sharma

S. N.	Name of Practicals
1	Draw a probability distribution curve with the help of coin ..
2	Draw a probability distribution curve with the help of dice ..
3	To determine the specific heat ratio (Cp/Cv)
4	To verify Newton's law of cooling .
5	To determine thermal efficiency of electric kettle .
6	To determine coefficient of thermal coductivity by Lee's disc method .
7	To determine Planck's constant .
8	To verify Stefen' s law
9	To draw thermistor characteritics .

Maharaja Ranjit Singh College of Professional Sciences, Indore

Department of Physics

Lesson Plan - B.Sc. III Sem (July 2016 - Dec 2016)

Subject - Physics

Teacher - Prof. Mahima Jain/Prof. Sudeep Sharma

Day/Lecture	Unit	Topic
1	1	Reflaction and refraction, Fermat`s principle
2	Geometrical Optics	Refraction at a spherical surface
3		Aplanatic points and its applications
4		Lens formula
5		Combination of thin lenses and equivalent focal length
6		Dispersion and dispersive power
7		Chromatic aberration and achromatic combination
8		Different types of aberration and their remedy
9		Need for multiple lenses in eyepieces
10		Ramsden eyepiece
11		Huygens eyepiece
12	2	The principle of superposition, Two slit interference
13	Interference of Light	Coherence requirement for the sources
14		Optical path retardations, Lateral shift of fringes
15		Rayleigh refractometer and other applications
16		Localised fringes, thin films
17		Interference by a film with two non-parallel reflecting surfaces
18		Newton`s rings
19		Haidinger fringes
20		Michelson interferometer
21		Its application for precision determination of wavelength
22		Wavelength difference and the width of spectral lines
23		Intesity distribution in multiple beam interference
24		Fabry-Parot interferometer and Etalon
25	3	Fresnel`s theory of half periiod zone
26	Diffraction	Diffraction at straight edge
27		Rectilinear propagation
28		Diffraction at a slit
29		phasor diagram and integral calculus method
30		Diffraction at a circular apperture and a circular disc

31		Rayleigh criterion of resolution of images
32		Resolving power of telescope
33		Resolving power of microscope
34		Face contrast microscopy
35		Diffraction at N-parallel slits
36		Intensity distribution,plane diffraction grating
37		Resolving power of a grating
38		Comparison with resolving power of a prism and of a Fabry-Parot etalon
39	4	Tansverse nature of light waves,polarisation of electromagnetic waves
40	Polarisation	Plane polarised light-production and analysis
41		Discription of linear ,circular and electrical polarisartion
42		Propogation of electromagnetic waves in anistropic media
43		Uniaxial and biaxial crystals
44		Symmetric nature of dielectric denser
45		Double refraction ,Huygen's principle
46		Ordinary and extra ordinary refractive indices
47		Fresnel's formula
48		Light propogation in uniaxial crystal
49		Nicol prism
50		Production of a circularly and eliptically polarised light
51		Babinet compensator and applications,Optical rotations
52		Optical rotations in liquids and its measurement through polarimeter
53	5	A brief history of laser
54	Lasers and	Characteristic of laser light
55	Photo Sensors	Einstein's prediction,relationship between Einstein's coefficients
56		Pumping scheme,resonators
57		Ruby laser
58		Helium-Neon laser
59		Applications of lasers
60		Principle of holography
61		Photo diode
62		Photo transitors and photo multipliers

Maharaja Ranjit Singh College of Professional Sciences, Indore

Department of Physics

Lesson Plan - B.Sc III SEM (July 2016- Dec 2016)

Subject - Physics Practical

Teacher - Prof. Mahima Jain/Prof.Sudeep Sharma

S. N.	**Name of Practicals**
1	To determine angle of simple prism .
2	To determine angle of minimum deviation of simple prism .
3	To detrmine refractive index of simple prism .
4	To detrmine dispersive power of simple prism .
5	To detrmine refractive index for ordinary and extra ordinary waves by calcite prism .
6	To determine resolving power of telescope .
7	To determine wavelength of LASER light with the help of plane transmission grating .
8	To determine wavelength of sodium light with the help of plane transmission grating .
9	To detrmine radius of curvature of convex !ens with the help of Newton's ring apparatus.
10	To detrmine wavelength of sodium light with the help of Newton's ring apparatus.
11	Study of optical rotation of sugar solution by polarimeter tube.