ANNUAL CURRICULAR PLAN I/III/V

YEAR: **2021-2022** PAPER: II BSC **III** NAME OF THE LECTURER: **P Rajeswari, GS Devi & V D Sandhya**

Month & Week	Hours available	Syllabus Topic	Additional Inputs / Value Additions	Curricular Activity				Co-Curricular Activity			
				Activity	Hours Allotted	Whether Conducted	If not Alternate Date	Activity	Hours Allotted	Whether Conducted	If not Alternate Date
June	16	**Aberrations:** Introduction to Chromatic aberration – calculation of longitudinal chromatic aberration of a thin lens – achromatism for two lenses (a) when in contact and (b) when separated by a distance – achromatism of a camera lens – Introduction to Spherical aberration – minimization of spherical aberration – Coma -- Astigmatism -- Curvature of field – distortion.		Matrix methods in Paraxial Optics. Aberrations	10 05	YES YES		Assignment I			
July	16	**Interference** Principle of superposition – coherence– conditions for Interference of light. **Interference by division of wave front:** Fresnel's biprism – determination of wave length of light -- Determination of thickness of a transparent material using Biprism – change of phase on reflection – Lloyd's mirror experiment. **Interference by division of amplitude:**	.	Interference	15	YES		Assignment II	1 hour	YES	

		Oblique incidence of a plane wave on a thin film due to reflected and transmitted light (Cosine law) – Colours of thin films – Non reflecting films -- Interference by a film with two non-parallel reflecting surfaces (Wedge shaped film) – Determination of diameter of wire. Newton's rings in reflected light with contact between lens and glass plate – Determination of wave length of monochromatic light – Michelson Interferometer – types of fringes – Determination of wavelength of monochromatic light and thickness of a thin transparent plate.						Seminar Assignment III	1 Hour 1 Hour	YES YES	
August	16	**Polarization:-** Polarized light : Methods of Polarization, Polarizatioin by reflection, refraction, Double refraction, scattering of light – Brewsters law – Malus law – Nicol prism as polarizer and analyzer – Refraction of plane wave incident on negative crystals (Huygen's explanation) – Quarter wave plate, Half wave plate– Optical activity, analysis of light by Laurent's half shade polarimeter. **Lasers :** Introduction – Spontaneous emission – Stimulated emission – Population inversion. Laser principle– Types of Lasers – He-Ne laser – Ruby laser – Semi conductor laser -- Laser characteristics -- Applications of lasers.		**Polarization** **Lasers**	08 09	YES YES		Seminar	1 hour	YES	
September	16	**Fiber Optics and Holography:**									

		Introduction – Optical fibers – Types of optical fibers – Step and graded index fibers –Fiber material – Principles of fiber communication (qualitative treatment only) -- advantages of fiber communication. Basic Principle of Holography and its applications. Gabor hologram. **Diffraction:** Introduction **– Fraunhoffer diffraction:-** Diffraction due to single slit– Limit of resolution – Fraunhoffer diffraction due to double slit – Fraunhoffer diffraction pattern with N slits (diffraction grating). Resolving Power of grating – Determination of wave length of light in normal and oblique incidence methods using diffraction grating.		Fiber Optics & Holography Diffraction	05 08	Yes YES		Assignment-IV Assignment	1 hour 1hour	YES YES	
October	8	**Fresnel diffraction** -- Fresnel's half period zones – area of the half period zones –zone plate – Comparison of zone plate with convex lens – Phase reversal zone plate – difference between interference and diffraction. Distinction between Fresnel and Fraunhoffer diffraction.		Fresnel Diffraction	08	YES					

ANNUAL CURRICULAR PLAN I/III/V

YEAR: **2021-2022** PAPER: II BSC II SEMESTER –PAPER-IV NAME OF THE LECTURER: **Dr VVS Naidu, ASS Jyothi & MS Ranganayakulu**

Month &	Hours	Syllabus Topic	Additional	Curricular Activity	

Week	available		Inputs / Value Additions					Co-Curricular Activity			
				Activity	Hours Allotted	Whether Conducted	If not Alternate Date	Activity	Hours Allotted	Whether Conducted	If not Alternate Date
June	12	**Electric field intensity and potential:** Gauss's law statement and its proof- Electric field intensity due to (1) Uniformly charged sphere and (2) an infinite conducting sheet of charge. Electrical potential – equi potential surfaces- potential due to i) a point charge, ii) charged spherical shell .		Electrostatics Dielectrics	8 6	YES YES		Assignment I	1	YES	
July	12	**Dielectrics:** Electric dipole moment and molecular polarizability- Electric displacement D, electric polarization P – relation between D, E and P- Dielectric constant and susceptibility. Boundary conditions at the dielectric surface.		Capacitance	10	YES		Assignment II	1	YES	
August	12	**Electric and magnetic fields** Biot-Savart's law, explanation and calculation of B due to long straight wire, a circular current loop and solenoid – Hall effect – determination of Hall coefficient and applications. **Electromagnetic induction** Faraday's law-Lenz's law- Self and mutual inductance, coefficient of coupling, calculation of self inductance of a long solenoid, energy stored in magnetic field. Transformer - energy losses - efficiency.		Magnetostatics	10	YES		Assignment-III	01 Hour	YES	
September	12	**Alternating currents and electromagnetic waves** Alternating current - Relation between current and voltage in LR and CR circuits,		Moving charges in electric and magnetic fields	8	YES		Seminar	02 Hours	YES	

		vector diagrams, LCR series and parallel resonant circuit, Q –factor, power in ac circuits. **Maxwell's equations :**Idea of displacement current - Maxwell's equations (integral and differential forms) (no derivation), Maxwell's wave equation (with derivation). Pointing theorem (statement), production of electromagnetic waves (Hertz experiment).		Electromagnetic Induction	4	YES		Assignment IV	01 Hour	YES	
October	6	**Basic electronics:** PN junction diode, Zener diode, I-V characteristics, PNP and NPN transistors, CB, CE and CC configurations – Relation betweenα, β and γ - transistor (CE) characteristics, Transistor as an amplifier. **Digital electronics:** Number systems - Conversion of binary to decimal system and vice versa. Binary subtraction (2's complement methods).Laws of Boolean algebra - De Morgan's laws-statement and proof, Basic logic gates, NAND and NOR as universal gates, exclusive-OR gate, Half adder and Full adder.		Electromagnetic Induction	6	YES		Assignment V	1	YES	

ANNUAL CURRICULAR PLAN II/IV/VI

YEAR: **2021-2022** **II BSC II SEMESTER (New Syllabus)** **PAPER: II** NAME OF THE LECTURER: **V SANDYA & P Rajeswari**

Month & Week	Hours available	Syllabus Topic	Additional Inputs / Value Additions	Curricular Activity				Co-Curricular Activity			
				Activity	Hours Allotted	Whether Conducted	If not Alternate Date	Activity	Hours Alloted	Whether Conducted	If not Alternate Date
September 2021	20	**Interference of light:** Introduction, Conditions for interference of light, Interference of light by division of wave front and amplitude, Interference in thin films: Plane parallel and wedge-shaped films, colours in thin films, Newton's rings in reflected light-Theory and experiment, Determination of wavelength of monochromatic light, Michelson interferometer and determination of wavelength.		**Interference of light**	06	Yes		Assignment PPT	1 1	Yes YES	
October 2021	16	**Diffraction of light:** Introduction, Types of diffraction: Fresnel and Fraunhoffer diffractions, Distinction between Fresnel and Fraunhoffer diffraction, Fraunhoffer diffraction at a single slit. Determination of wavelength of light using diffraction grating, Resolving power of grating, Fresnel's half period zones, Zone plate, comparison of zone plate with convex lens.		**Diffraction of light:**	06	Yes		PPT Assignment	1 1	Yes Yes	

November 2021	16	**Polarisation of light:** Polarized light: Methods of production of plane polarized light, Double refraction, Brewster's law, Malus law, Nicol prism, Nicol prism as polarizer and analyzer, Quarter wave plate, Half wave plate, Plane, Circularly and Elliptically polarized light-Production and detection, Optical activity, Laurent's half shade polarimeter: determination of specific rotation. **Aberrations**: Monochromatic aberrations, Spherical aberration, Methods of minimizing spherical aberration, Coma, Astigmatism and Curvature of field, Distortion; Chromatic aberration-the achromatic doublet; Achromatism for two lenses (i) in contact and (ii) separated by a distance.		**Polarisation of light:** **Aberrations**:	12 06	Yes Yes		Assignment Assignment IV Student seminar	1 1 1	Yes YES Yes	
December 2021	16	**Fibre optics:** Introduction to Fibers, different types of fibers, rays and modes in an optical fiber, Principles of fiber communication (qualitative treatment only), Advantages of fiber optic communication. **Lasers and Holography:** **Lasers:** Introduction, Spontaneous emission, stimulated emission, Population Inversion, Laser principle, Einstein coefficients, Types of lasers-He-Ne laser, Ruby laser, Applications of lasers; **Holography:** Basic principle of holography, Applications of holography.		**Fibre optics:** **Lasers and Holography:**	06 06	Yes Yes		Student seminar I Assignment	1 1	Yes YES	

YEAR: **2021-2022** PAPER: **I BSC I SEMESTER (New Syllabus)** NAME OF THE LECTURER: **DR. L. MALLESWARA RAO, P RAMAKRISHNA RAO, ASS JYOTHI, V SANDYA & P Rajeswari**

Month & Week	Hours available	Syllabus Topic	Additional Inputs / Value Additions	Curricular Activity				Co-Curricular Activity			
				Activity	Hours Allotted	Whether Conducted	If not Alternate Date	Activity	Hours Alloted	Whether Conducted	If not Alternate Date
November 2021	16	**Mechanics of Particles:** Review of Newton's Laws of Motion, Motion of variable mass system, Motion of a rocket, Multistage rocket, Concept of impact parameter, scattering cross-section, Rutherford scattering-Derivation. **Mechanics of Rigid bodies:** Rigid body, rotational kinematic relations, Equation of motion for a rotating body, Angular momentum and Moment of inertia tensor, Euler equations, Precession of a spinning top, Gyroscope, Precession of atom and nucleus in magnetic field, Precession of the equinoxes.	**Precession of atom and nucleus in magnetic field**	**Mechanics of Particles** **Mechanics of Rigid bodies**	4 6	Yes Yes		PPT Assignment PPT	1 1 1	Yes Yes Yes	
December 2021	16	**Motion in a Central Force Field:** Central forces, definition and examples, characteristics of central forces, conservative nature of central forces, Equation of motion under a central force, Kepler's laws of planetary motion-Proofs, Motion of satellites. **Relativistic Mechanics:** Introduction to relativity, Frames of reference, Galilean transformations, absolute frames, Michelson-Morley	**Motion of satellites**. **variation of mass with velocity**	**Motion in a Central Force Field** **Relativistic Mechanics:**	4 6	Yes Yes		PPT Assignment PPT	1 1 1	Yes Yes Yes	

		experiment, negative result, Postulates of Special theory of relativity, Lorentz transformation, time dilation, length contraction, variation of mass with velocity, Einstein's mass-energy relation						Student seminars	1	Yes	
January 2022	16	**Undamped, Damped and Forced oscillations:** Simple harmonic oscillator and solution of the differential equation, Damped harmonic oscillator, Forced harmonic oscillator – Their differential equations and solutions, Resonance, Logarithmic decrement, Relaxation time and Quality factor. **Complex vibrations:** Fourier theorem and evaluation of the Fourier coefficients, analysis of periodic wave functions-square wave.		**Undamped, Damped and Forced oscillations** **Complex vibrations**	5 5	Yes Yes		Assignment Assignment	1 1	YES YES	
February 2022 March 2022	16 12	**Vibrating Strings:** Transverse wave propagation along a stretched string, General solution of wave equation and its significance, Modes of vibration of stretched string clamped at ends, Overtones and Harmonics, Melde's strings. **Ultrasonics:** Ultrasonics, General Properties of ultrasonic waves, Production of ultrasonics by piezoelectric and magnetostriction methods, Detection of ultrasonics, Applications of ultrasonic waves, SONAR		**Vibrating Strings:** **Ultrasonics**	8 8	Yes Yes		Assignment Student seminar	1 1	Yes Yes	

ANNUAL CURRICULAR PLAN II/IV/VI

YEAR: **2020-2021** PAPER: II BSC III SEMESTER PAPER-II NAME OF THE LECTURER: **Dr A P V Appa Rao, Sri J Rama Mohan, P Rajeswari & GS Devi**

Month & Week	Hours available	Syllabus Topic	Additional Inputs / Value Additions	Curricular Activity				Co-Curricular Activity			
				Activity	Hours Allotted	Whether Conducted	If not Alternate Date	Activity	Hours Allotted	Whether Conducted	If not Alternate Date
December	15	**Kinetic theory of gases:** Introduction – Deduction of Maxwell's law of distribution of molecular speeds, Transport Phenomena – Viscosity of gases – thermal conductivity – diffusion of gases. **Thermodynamics :** Introduction – Reversible and irreversible processes – Carnot's engine and its efficiency – Carnot's theorem – Second law of thermodynamics, Kelvin's and Claussius statements – Thermodynamic scale of temperature.		Transport Phenomena Carnot's engine and it's efficiency	01 01	YES YES		Assignment I	1	YES	
January	15	**Entropy**:- Entropy, physical significance – Change	.								

		in entropy in reversible and irreversible processes – Entropy and disorder – Entropy of universe – Temperature-Entropy (T-S) diagram. Change of Entropy of a perfect gas – Change of entropy when ice changes into steam. **Thermodynamic potentials and Maxwell's equations:** Thermodynamic potentials – Derivation of Maxwell's thermodynamic relations – Clausius-Clayperon's equation – Derivation for ratio of specific heats – Derivation for difference of two specific heats for perfect gas. Joule Kelvin effect – expression for Joule Kelvin coefficient for perfect and Vanderwaal's gas.		Change of Entropy of a perfect gas Clausius-Clayperon's equation	07 08	YES YES		Assignment II Seminar Assignment III Seminar	1 hour 1 1 Hour 1 Hour	YES YES YES YES	
February	15	**Low temperature Physics:** Introduction – Joule Kelvin effect – liquefaction of gas using porous plug experiment. Joule expansion – Distinction between adiabatic and Joule Thomson expansion – Expression for Joule Thomson cooling – Liquefaction of helium, Kapitza's method – Adiabatic demagnetization – Production of low temperatures – Principle of refrigeration, vapour compression type. Working of refrigerator and Air conditioning		Adiabatic demagnetization Production of low temperatures	15	YES		Assignment IV	1 hour	YES	

		machines. Effects of Chloro and Fluro Carbons on Ozone layer.									
March	15	**Quantum theory of radiation:** Black body-Ferry's black body – distribution of energy in the spectrum of Black body – Wein's displacement law, Wein's law, Rayleigh-Jean's law – Quantum theory of radiation - Planck's law – deduction of Wein's law and Rayleigh-Jeans law from Planck's law - Measurement of radiation – Earth as a Black Body. Types of pyrometers – Disappearing filament optical pyrometer – experimental determination – determination of solar constant, effective temperature of sun.		Disappearing filament optical pyrometer – experimental determination	15	Yes		Assignment V	1 hour	YES	

ANNUAL CURRICULAR PLAN

YEAR: **2021-2022** PAPER:III BSC VI SEMESTER PAPER-**VII** NAME OF THE LECTURER: **GS Devi, K Naveen Kumar & A Rajesh**

Month & Week	Hours available	Syllabus Topic	Additional Inputs / Value Additions	Curricular Activity				Co-Curricular Activity			
				Activity	Hours Allotted	Whether Conducted	If not Alternate Date	Activity	Hours Allotted	Whether Conducted	If not Alternate Date

December	12	**Introduction to Energy:** Definition and units of energy, power, Forms of energy, Energy flow diagram to the earth. Role of energy in economic and social development. **Environmental Effects:** Environmental degradation due to energy production and utilization, air and water pollution, depletion of ozone layer, global warming, biological damage due to environmental degradation.		Role of energy in economic and social development.	01	YES		Assignment	1	YES	
January	12	**Global Energy Scenario:** Energy consumption in various sectors, energy resources, coal, oil, natural gas, nuclear and hydroelectric power. **Indian Energy Scene:** Energy resources available in India, urban and rural energy consumption, nuclear energy - promise and future, energy as a factor limiting growth, need for use of new and renewable energy sources.		Energy resources available in India	01	YES		Assignment	1	YES	
February	12	**Solar energy:** Solar energy, Spectral distribution of radiation, solar water heating system, Applications, Solar cooker. Solar cell, Types of solar cells. **Wind Energy:** Introduction, Principle of wind energy conversion, and Components of wind turbines, Operation and characteristics of a wind turbine, Applications of wind energy.		Solar energy, Spectral distribution of radiation	01	YES		Assignment	01	YES	
March	12	**Ocean Energy:** Introduction, Principle of ocean thermal energy conversion, Tidal power generation, Tidal energy technologies, Energy from waves. **Hydrogen Energy:** History of hydrogen		Energy from biomass – Sources of	01	YES		Seminar	01	YES	

		energy-Hydrogen production methods-Electrolysis of water, uses of hydrogen as fuel. **Bio-Energy** Energy from biomass – Sources of biomass – Conversion of biomass into fuels – Energy through fermentation – Pyrolysis, gasification and combustion – Aerobic and anaerobic bio-conversion – Properties of biomass –Properties and characteristics of biogas.		biomass – Conversion of biomass into fuels				Assignment	01	YES	

ANNUAL CURRICULAR PLAN II/IV/VI

YEAR: 2021-2022 (V SEMESTER) PAPER: VI NAME OF THE LECTURER: **DR APV APPARAO**, **DR L MALLESWARA RAO, G Suvarchala Devi & P RAJESWARI**

Month & Week	Hours available	Syllabus Topic	Additional Inputs / Value Additions	Curricular Activity				Co-Curricular Activity			
				Activity	Hours Allotted	Whether Conducted	If not Alternate Date	Activity	Hours Alloted	Whether Conducted	If not Alternate Date
Dec	12	**Atomic and molecular physics** Introduction –Drawbacks of Bohr's atomic model. Vector atom model and Stern-Gerlach experiment - quantum numbers associated with it. L-S and j- j coupling schemes. Zeeman effect (Definition only) - Raman effect, hypothesis, Stokes and Anti Stokes lines. Quantum theory of Raman effect. Experimental			09	Yes		Assignment I	1	Yes	

		arrangement –Applications of Raman effect.									
Jan	12	**Matter waves & Uncertainty Principle** Matter waves, de Broglie's hypothesis - wavelength of matter waves, Properties of matter waves - Davisson and Germer experiment – Heisenberg's uncertainty principle for position and momentum (x and p) & Energy and time (E and t). **Quantum (wave) mechanics** Basic postulates of quantum mechanics-Schrodinger time independent and time dependent wave equations-derivations. Physical interpretation of wave function. Eigen functions, Eigen values. Application of Schrodinger wave equation to particle in one dimensional infinite box.			09 09	Yes Yes		Student seminar I Assignment II Assignment III	1 1	Yes YES	
Feb	12	**General Properties of Nuclei** Basic ideas of nucleus -size, mass, charge density (matter energy), binding energy, magnetic moment, electric moments. Liquid drop model and Shell model (qualitative aspects only) - Magic numbers. **Radioactivity decay** Alpha decay: basics of α-decay processes. Theory of α-decay, Gamow's theory, Geiger Nuttal law. β-decay, Energy kinematics for β-decay, positron emission, electron capture, neutrino hypothesis.			09	Yes Yes		PPT Assignment IV Career Guidance Class	1 1 1	Yes YES Yes	
Mar	06	**Crystal Structure** Amorphous and crystalline materials, unit cell, Miller indices, reciprocal lattice, types of lattices, diffraction of X-rays by crystals, Bragg's law, experimental techniques, Laue's method. **Superconductivity** Introduction - experimental facts, critical temperature - critical field - Meissner effect –Isotope effect - Type I and type II superconductors - applications of superconductors.			09	Yes		PPT seminar Career Guidance Class Assignment V	1 1 1 1	Yes Yes Yes Yes	

ANNUAL CURRICULAR PLAN

YEAR: **2021-2022 (VI SEMESTER)** PAPER: **VIII CE 1** NAME OF THE LECTURER: **P RAMAKRISHNA RAO**

Month & Week	Hours available	Syllabus Topic	Additional Inputs / Value Additions	Curricular Activity				Co-Curricular Activity			
				Activity	Hours Allotted	Whether Conducted	If not Alternate Date	Activity	Hours Alloted	Whether Conducted	If not Alternate Date
Nov Dec	6 12	**Basics of Solar Radiation:** Structure of Sun, Solar constant, Concept of Zenith angle and air mass, Definition of declination, hour angle, solar and surface azimuth angles; Direct, diffuse and total solar radiation, Solar intensity measurement – pyrheliometer.			9	Yes		Assignment I Student seminar I	1 1	Yes Yes	
Jan	12	**Radiative Properties and Characteristics of Materials:** Kirchoff's law – Relation between absorptance, emittance and reflectance; Selective Surfaces - preparation and characterization, Types and applications; Anti-reflective coating. **Flat Plate Collectors (FPC) :** Description of flat plate collector, Liquid heating type FPC, Energy balance equation, Efficiency, Temperature distribution in FPC, Definitions of fin efficiency and collector efficiency, Evacuated tubular collectors.			9 9	Yes Yes		Assignment II PPT I Assignment III Career Guidance Class	1 1 1 1	Yes Yes Yes Yes	
Feb	12	**Solar photovoltaic (PV) cell:** Physics of solar cell –Type of interfaces, homo, hetero and schottky interfaces, Photovoltaic Effect, Equivalent circuit			9	Yes		Assignment IV	1	Yes	

		of solar cell, Solar cell output parameters, Series and shunt resistances and its effect on cell efficiency; Variation of efficiency with band-gap and temperature. **Solar PV systems:** Solar cell module assembly – Steps involved in the fabrication of solar module, Module performance, I-V characteristics, Modules in series and parallel, Module protection, Solar PV system and its components, PV array, inverter, battery and load.			9	Yes		PPT II Student seminar II	1 1	Yes Yes	
Mar	06	**Solar thermal applications:** Solar hot water system (SHWS), Types of SHWS, Standard method of testing the efficiency of SHWS; Passive space heating and cooling concepts, Solar desalinator and drier, Solar thermal power generation.			06	Yes		Assignment V Career Guidance Class	1 1	Yes Yes	

ANNUAL CURRICULAR PLAN

YEAR: **2021-22 (VI SEMESTER)** PAPER: **VIII CE 2** NAME OF THE LECTURER: **CH SUNDAR SINGH**

Month & Week	Hours available	Syllabus Topic	Additional Inputs / Value Additions	Curricular Activity				Co-Curricular Activity			
				Activity	Hours Allotted	Whether Conducted	If not Alternate Date	Activity	Hours Alloted	Whether Conducted	If not Alternate Date
Nov Dec	6 12	**Introduction:** Wind generation, meteorology of wind, world distribution of wind, wind speed variation with height, wind speed statistics, Wind energy conversion principles; General introduction; Types and classification of WECS;			9	Yes		Assignment I Student seminar I	1 1	Yes Yes	

		Power, torque and speed characteristics.									
Jan	12	**Wind Energy Conversion System:** Aerodynamic design principles; Aerodynamic theories; axial momentum, blade element; Rotor characteristics; Maximum power coefficient. **Wind Energy Application:** Wind pumps: Performance analysis, design concept and testing; Principle of wind energy generation; Wind energy in India; Environmental Impacts of Wind farms.			9 9	Yes Yes		Assignment II PPT I Assignment III Career Guidance Class	1 1 1 1	Yes Yes Yes Yes	
Feb	12	**Small Hydropower Systems:** Overview of micro, mini and small hydro systems; Hydrology; Elements of pumps and turbine; Selection and design criteria of pumps and turbines; Site selection; Speed and voltage regulation. **Ocean Thermal, Tidal and Wave Energy Systems:** Ocean Thermal - Introduction, Technology process, working principle, Electricity generation methods from OCET, Advantages and disadvantages, Applications of OTEC.			9 9	Yes Yes		Assignment IV PPT II Student seminar II	1 1 1	Yes Yes Yes	
Mar	06	**Tidal Energy** - Introduction, Origin and nature of tidal energy, Wave Energy – Introduction, Basics of wave motion, Power in waves, Wave energy conversion devices, Advantages and disadvantages, Applications of wave energy.			05	Yes		Assignment V Career Guidance Class	1 1	Yes Yes	

ANNUAL CURRICULAR PLAN

YEAR: **2021-2022 (VI SEMESTER)** PAPER: **VIII CE3** NAME OF THE LECTURER: **DR L MALLESWARA RAO**

Month & Week	Hours available	Syllabus Topic	Additional Inputs / Value Additions	Curricular Activity				Co-Curricular Activity			
				Activity	Hours Allotted	Whether Conducted	If not Alternate Date	Activity	Hours Alloted	Whether Conducted	If not Alternate Date
Nov Dec	6 12	**Energy Storage:** Need of energy storage; Different modes of energy storage, Flywheel storage, Electrical and magnetic energy storage: Capacitors, electromagnets; Chemical Energy storage: Thermo-chemical, photo-chemical, electro-chemical, Hydrogen for energy storage.			9	Yes		Assignment I Student seminar I	1 1	Yes Yes	
Jan	12	**Electrochemical Energy Storage Systems:** Batteries: Primary, Secondary, Lithium, Solid-state and molten solvent batteries; Lead acid batteries; Nickel Cadmium Batteries; Advanced Batteries. Role of carbon nano-tubes in electrodes. **Magnetic and Electric Energy Storage Systems:** Superconducting Magnet Energy Storage (SMES) systems; Capacitor and battery: Comparison and application; Super capacitor:			9 9	Yes Yes		Assignment II PPT I Assignment III Career Guidance Class	1 1 1 1	Yes Yes Yes Yes	
Feb	12	**Fuel Cell:** Fuel cell definition, difference between batteries and fuel cells, fuel cell components, principle and working of fuel cell, performance characteristics, efficiency. Advantages and disadvantages of fuel cell.			9	Yes		Assignment IV PPT II Student seminar II	1 1 1	Yes Yes Yes	

Mar	06	**Types of Fuel Cells:** Classification, Alkaline fuel cell, phosphoric acid fuel cell, molten carbonate fuel cell; solid oxide fuel cell, applications of fuel cells.			05	Yes		Assignment V Career Guidance Class	1 1	Yes Yes	