Adv.M.N.Deshmukh Arts,Science & Commerce College Rajur.

Auunal Planning for the Year 2023-2024

F.Y.BSc Physics P –II (2019 CBCS Patten)

SEM– I (PHY-112) Physics principles & Applications

SEM - II (PHY-122) Electricity & Magnetism

Sr.No	Month	Total Lecture	Name of the Topic
	SEM -I		**Physics principles & Applications**
1	July 2023	08	**Ch –I Physics of Atoms (8 L)** 1.1 Introduction to Atom 1.2 Atomic Models: 1.2.1 Thomson's Atomic Model 1.2.2 Rutherford's Atomic Model 1.2.3 Bohr's Atomic Model 1.3 Atomic Spectra: 1.3.1 Emission line Spectrum 1.3.2 Absorption line spectrum 1.3.3 Uses of Atomic Spectra 1.4 Classical planetary model of Hydrogen Atom 1.5 The Bohr Theory of the Hydrogen Atom 1.6 The Hydrogen Spectrum 1.7 Frank-Hertz experiment 1.8 Problems
2	August 2023	12	**Ch- II LASERS and Its Applications (7 L)** 2.1 Introduction to LASERS 2.2 Basic Principle of Lasers: Three Processes 2.3 Characteristics of Lasers: brief explanation 2.4Boltzmann Distribution Law 2.5 Population Inversion and Pumping 2.6 Types of Lasers: 2.6.1 He-Ne Laser 2.6.2 Ruby Laser 2.7 Applications of Laser 2.8 Problems **Ch-III** Physics of Molecules **(05L)** 3.1 Introduction to Bonding Mechanisms 3.2 Forces between Atoms 3.3 Types of Bonding: 3.3.1 Ionic Bonds 3.3.2 Covalent Bonds 3.3.3 van der Waal's Bonds
3	September 2023	12	**Ch-III** Physics of Molecules **(03L)** 3.3.4 Hydrogen Bond 3.3.5 Metallic Bond 3.4 Rotation energy levels of a diatomic molecule 3.5 Vibration energy levels of a diatomic molecule **Ch-IV Sources of Electromagnetic Waves (06 L)** 4.1 Introduction to Electromagnetic Waves: Historical Perspective 4.2 General properties of Electromagnetic radiations 4.3 Electromagnetic spectrums and its sources 4.4.Production of electromagnetic waves: Hertz experiment

4	September 2023		**Ch-IV Sources of Electromagnetic Waves** 4.5 Planck Hypothesis of Photon 4.6 Applications of various waves in electromagnetic spectrum. **Ch-V Applications of Electromagnetic Waves (03L)** 5.1 Microwave Oven 5.2 RADAR 5.3 Pyro electric Thermometer,
5	October 2022	04	**Ch-V Applications of Electromagnetic Waves (04L)** 5.4 X-Ray radiography 5.5 CT Scan. 5.6 Solar cells& its types, problems.
	SEM II		**Electricity & Magnetism**
6	December 2023	08	**Ch-I Electrostatics (8L)** i)Revision of Coloumb's Law, ii) Superposition Principle iii) Wlectric field due to an electric dipole,line and Disc iv) Revision of Guass's Law v) Coulomb's Law from Guass law vi) Guass Law applicationin Cyllidrical,Planar and spherical symmetry vii) Problems **Ch-II Dielectrics (1L)** i)Electric Dipole
7	January 2024	12	**Ch-II Dielectrics (8L)** ii)Electric dipole and dipole moment iii)Electric potential and intensity at any point due to dipole iv)Torque on a dipole placed in an electric field v)Polar and non-polar molecules vi)Electric polarization of dielectric material vii)Gauss' law in dielectric viii) Problems **Ch-III Magnetostatics (4L)** i)Revision of Biot-Savart's law with examples ii)Amperes' law, e.g. Solenoid and Toroid iii) Gauss law for magnetism iv) Problems
8	February 2024	12	**Ch-III Magnetostatics (5L)** iii) Gauss law for magnetism iv) Problems. **Ch-IV Properties of Magnetic Materials (7L)** i)Magnetic materials and Bohr magneton ii)Magnetization (M), magnetic intensity (H), magnetic induction (B), magnetic susceptibility and permeability iii) Relation between B, M and H
9	March 2024	02	**Ch-IV Properties of Magnetic Materials (2L)** iv) Hysteresis v) Problems Revision

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Annual Planning for the Year 2023- 24

S.Y.BSc Physics P –II (CBCS Pattern 2019)

Semister – III (PHY-232 A Electronics)

Sr.No	Month	Total Lectures	Name of the Topic
2	July 2023	09	**Ch-I Network Theroems (3L)** Thevenin,s theorm, Norton,s theorm Superpostion theorm,Maximum power transfer theorm, problem **Ch-II Study Of Transistor.(06L)** BJT and its configurations (CE,CB,CC), Defn of alpha,beta, Biasing methods, transistor characteristics,AC & DC load line, ,
3	Aug 2023	12	**Ch-II Study Of Transistor.(06L)** Transistor applications,Frequency response of CE transistor amplifier UJT Transistor: Prinicile, construction and operation, Problem. **Ch-III Operational Amplifiers (06 L)** Operational amplifier-741: Block diagram, characteristics, concept of virtual ground. Inverting and non-inverting amplifier and it's gain, Op-amp as an adder & substractor,.
4	September 2023	10	**Ch-III Operational Amplifiers (06L)** Oscillator: concept of positive and negative feedback, Barkhausen criteria for an oscillator, Phase shift, Problem **Ch-IV Digital electronics (4L)** Number system: Binary, BCD, OCTAL AND Hexa-decimal number system,Addition, Substraction of binary number, 1's and 2's complement, Basic logic gate: AND,OR,NOT. Derived gates: NAND,NOR,EX-OR and EX-NOR gate,Boolean algebra, Boolean equations,
5	October 2023	02	**Ch-VI Digital electronics (2L)** De-Morgan's Theorms and it's verificatios, Problem **REVISION**

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S.Y.BSc. Physics P –II (CBCS Pattern 2019)

Semister – IV (PHY-242 OPTICS)

Sr.No	Month	Total Lectures	Name of the Topic
1	Dec 2023	02	**Ch-I (a) Geometrical Optics (02L)** Introduction, Lenses: thick and thin, Sign convention, Thin Lenses: lens equations,
2	January 2024	10	**Ch-I(a)Geometrical Optics (06L)** Lens Maker's formula,. Magnification of thin lens Deviation by thin lens, power of thin lens Equivalent focal length, Equivalent focal length of two thin lens Cardinal points Problems. **Ch-I(b)Lens Aberrations (4L)** . Introduction to Aberration 1.9 Types of aberration: Monochromatic and Chromatic Aberration (Only discussion)
3	Feb 2024	12	**Ch-II Lens Aberrations (2L)** Types of chromatic aberration: Achromatism (lenses in contact and separated by finite distance),Problems. **Ch-III Optical Instruments (10L)** Introduction, Simple microscope, Compound microscope. Eyepiece: Huygen's eyepiece, Ramsden's eyepiece, Problems. **Ch-IV Interference and Diffraction (2L)** Revision of Interference, Phase change on reflection (Stokes treatment).
4	March 2024	10	**Ch-IV Interference and Diffraction (10L)** Interference by parallel sided thin film-Interference due to reflected light, Interference due to refracted light, Interference by wedge shaped thin film, Diffraction: Types of Diffraction-Fresnel's diffraction and Fraunhoffer diffraction, Fraunhoffer's diffraction at double slit, Fraunhoffer diffraction at N slit, Plane diffraction grating, Newton's ring, Rayleigh criterion for resolution, Problems. **Ch-V Polarisation (4L)** Polarisation: Introduction, Types of polarization-Plane circular, elliptical, Polarisation by reflection of light, Brewster's law, Law of Malus, Polarisation by double refracting crystals, Linear polariser
5	April 2024	02	**Ch-V Polarisation (2L)** Nicol Prism, Problems. **REVISION**

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T.Y.BSc **Semister – V** (CBCS Pattern 2019)

Physics P –VI **(PHY-356 Elective-I (D): Renewable Energy Sources-I)**

Sr.No	Month	Total Lectures	Name of the Topic
1	July 2023	10	**CH-I An Introduction to Energy Sources: (10L)** 1. Energy: Definition, Classifications of energy sources 2. Conventional and non-conventional energy sources. 3. Sun: The source of energy (Structure, Characteristics and Composition) 4. Solar Constant 5. Electromagnetic Energy Spectrum. 6. Solar radiations outside earth atmosphere. 7. Solar radiation at the earth surface. 8. Problems
3	August 2023	10	**CH-II Photothermal Applications: (10L)** 1. Photothermal devices: Solar Insolation, Selective Coating, Glass Cover, Heat Conductor and Heat Insulation. 2. Solar water heating systems: Types, construction and working of Liquid Flat Plate Collector (FPC) and Evacuated Tube Collector (ETC) 3. Energy Balance Equation (without thermal Analysis). 4. Concentrating collectors: Flat plate collector with plane reflector, Cylindrical parabolic, Compound parabolic, collector with fixed circular concentrators and moving receiver, paraboloid concentrator. 5. Comparative study between flat plate collector and solar concentrators. 6. Solar distillation, Solar dryer, Solar cooker (box type)
4	Sepember 2023	10	**CH-III Photovoltaic systems: (10L)** 1. Introduction to Photovoltaic effect and Photovoltaic Conversion. 2. Basic photovoltaic system for power generation 3. Basics of Solar Cell, PV modules, Arrays, 4. Solar Cell: I-V characteristics, Power output and conversion efficiency. 5. Factors affecting on photovoltaic efficiency. (Change in amount of input light, solar cell area, Change in angle, Change in operating Temperature etc.) 6. Types of solar cells: p-n junction solar cell, p-i-n diode solar cell, cadmium sulphide solar cell, Gallium arsenide solar cell, Indium phosphide solar cell, nano-crystalline solar cell. 7. Application of solar photovoltaic systems.
5	October 2023	06	**CH-IV Energy Storage: (06L)** 1. Importance and Needs of Energy storage in Conventional and Nonconventional Energy Systems. 2. Various forms of Energy Storage 3. Electrical Energy: Super capacitors 4. Electrochemical Energy: Battery 5. Chemical Energy: Hydrogen Production and storage machines, Wind data **REVISION**

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T.Y.BSc **Semister – VI** (CBCS Pattern 2019)

Physics P –V **(PHY-365 (A): Electronics-II)**

Sr.No	Month	Total Lectures	Name of the Topic
1	Dec 2023	06	**CH-I Semiconductor Devices: (6L)** a. LED and Photodiode, Optocoupler. (Working Principles) Problems. b. BJT: Transistor amplifier classifications - Class A, B, C and AB (working only), Differential amplifier (transistorized), Problems..
3	Jan 2024	12	**CH-I Semiconductor Devices: (3L)** c. Field Effect Transistor: JFET (Introduction, classification, principle, working and IV characteristics) MOSFETs (DE-MOSFET and E only MOSFET). Problems **CH-II Applications of Semiconductor Devices: (9L)** a. Three Pin Regulators: Block diagram of 3-pin IC regulator, study of IC-78XX, 79XX. Dual Power Supply using IC-78XX, 79XX. b. Switching Regulators (SMPS): Introduction, Block diagram, Advantages and Disadvantages. c. Modulation and Demodulation : Concept of Carrier Wave, Need of Modulation and Demodulation, Methods of Modulation like AM, FM, PM (Concepts Only), d. Concept of Modulation Index, Upper and Lower Side Band Frequencies in AM. Problems,
4	Feb 2023	12	**CH-III Integrated Circuits: (9L)** a. Integrated Circuits: Introduction, Scale of Integration, Advantages and drawbacks of IC b. OP-AMP Applications as Integrator, Differentiator, Comparator. c. Timer IC-555: Block diagram, Astable, monostable, multivibrator (working and design). Problems, **CH- Combinational and Sequential Circuits: (3L)** a. Combinational Circuits: Introduction to SOP and POS equation. Concept of Standard SOP and POS equation
5	March 2023	06	**CH- Combinational and Sequential Circuits: (6L)** Concept of K-map and their use in reduction of Boolean expressions, design of half adder, full adder, half subtract, Study of binary to gray and gray to binary code conversion. Problems. b. Sequential Circuits: RS flip flop using NAND/NOR, clocked RS, D, JK and T-flip flops. Application of flip flops in Sequential Circuits as Counters and Registers. Asynchronous and Synchronous Counters. (3-bit Counter), Shift Registers and their types of operation -SISO, SIPO, PISO, PIPO (Concepts only). **REVISION**

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