# DEPARTMENT OF PHYSICS ACADEMIC PLAN 2022-23
## ODD SEMESTER

| Week | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name | Sem/ paper | "18/06/2022-19/06/2022" | 20/06/2022-25/06/2022 | 27/06/2022-2/07/2022 | 4/7/2022-09/7/2022 | 11/7/2022-16/07/2022 | 18/07/2022-23/07/2022 | 25/07/2022-30/07/2022 | 1/8/2022-6/8/2022 | 8/08/2022-13/08/2022 | 17/08/2022-23/08/2022 | 24/08/2022-30/08/2022 | 05/09/2022-10/9/2022 | 12/9/2022-17/9/2022 | 09/09/2022-24/09/2022 | 26/09/2022-30/09/2022 |
| *Dr. Deepak More* | Sem I Theory | | | | HWR, FWR and Bridge rectifier: Efficiency and Ripple factor | Filter: Capacitor, Choke i/p Number Systems | Number system convertion, Binary add, subtract | Logic gates, Universal Building blocks | Thevenin`s Thm and Reciprocity thm | Norton`s Thm and Maximum power transfer thm | Intro: Transient, R, L, C, Series LR, Series CR | Transient: Series LCR Growth and Decay | AC: R, L, C, Series LR, Series CR | LCR resonance, Series and parallel, | power in AC ckt, Q factor, transformer, General AC bridge, Maxwell`s Bridge | De-Sauty`s, Wein`s, Schering`s AC Bridge |
| | MSc Sem II Paper I Theory. | | | Introduction, Constraints, Degrees of freedom, Generalised coordinates, Examples, Problems | Variational Principle, Euler Lagrange Equation | Hamiltonian Least action Principle, Lagranges Equation of motion | Problems | Lagrange's Multiplier and problems | DeAlemberts Principle and Lagrange's Equation of motion . | Ignorable coordiantes, conservation laws, problems | Central forces, Introduction, definition, Angular momenturm conservation | Bounded, unbounded systems, Differential equation for orbit under central forces | Least Action principle, Lagrangian equation of motion | Kepler's laws of motion, problems, Virial Theorem | Scattering theroy and problems | Scattering theory and problems, Revision |
| | Sem III Pract | | | | | | | | | | | | | | | |
| *Dr.Geeta Nair* | Sem I Theory | | | Introduction to syllabus, and CLO and PLO Revision of basic vector algebra and Theorems | Unit 1 Review of concept of elasticity Equivalence of shear strain to compression and extension strain | Unit 1 Equation of continuity, Bernoulli's equatio | Unit 1 streamline and turbulent flow, lines of flow in air foil, Poiseuille's equation | Unit 1 Partial Differentiation Total Derivative, Partial Differentiation of Composite Function | Unit 2 Composition of two perpendicular S H M's having same period and period in the ratio 1:2, Lissajous figures. | Unit 2 Centre of mass of a system of particles, Linear momentum of a system of particles and its conservation | Unit 2 Angular momentum of a system of particles and its conservation (only statement). Rocket motion | Unit 2 General solution of wave equation, Classification of waves, Transverse wave on string, Longitudinal Waves on Rod | Unit 3: Piezoelectric effect, Production of Ultrasonic waves: | Unit 3: Properties and applications of Ultrasonic Waves Reverberation, Sabine's formula | Unit 3: Acoustics of Buildings, factors affecting Acoustics of Buildings, Sound distribution in an auditorium | Unit 3: Bioacoustics Revision of Unit 3 Summary of all units. |
| | Sem V Theory. | Unit 1 Introduction to electrodynamics Gauss' law | Unit 1 applications of Gauss law, Divergence and curl of E | Unit 1 The potential of a localized charge distribution Poisson's equation and Laplace's equation, | Unit 1 Dielectrics, , Bound charges and their physical interpretation, Gauss' law in presence of dielectrics | Revision of Unit 1 Unit 2 The Divergence and Curl of B, Applications of Ampere's Law | Unit 2 Dia-magnets Paramagnets Ferro magnets Bound currents and their physical interpretation, | Unit 2 Ampere's law in magnetized materials Magnetic susceptibility and permeability. | Unit 2 Maxwell's correction to Ampere's law, Maxwell's equations . | Unit 2 Maxwell's equations in matter Boundary conditions | Revision of Unit 2 Unit 3 The continuity equation, Poynting's theorem | Unit 3 Electromagnetic waves in vacuum, and matter, The wave equation for E and B, | Unit 3 Monochromatic Plane waves, Energy and momentum in electromagnetic waves | Unit 3 Reflection and transmission of EM waves at normal incidence. | Revision | Revision |
| | Sem I Pract. | | | | | | | | | | | | | | | |
| | Sem V Pract. | | | | | | | | | | | | | | | |
| *MrA.M. Shaker* | Sem I Theory | | | | Unit 1 Review of concept of elasticity Equivalence of shear strain to compression and extension strain | Unit 1 Equation of continuity, Bernoulli's equatio | Unit 1 streamline and turbulent flow, lines of flow in air foil, Poiseuille's equation | Unit 1 Partial Differentiation Total Derivative, Partial Differentiation of Composite Function | Unit 2 Composition of two perpendicular S H M's having same period and period in the ratio 1:2, Lissajous figures. | Unit 2 Centre of mass of a system of particles, Linear momentum of a system of particles and its conservation | Unit 2 Angular momentum of a system of particles and its conservation (only statement). Rocket motion | Unit 2 General solution of wave equation, Classification of waves, Transverse wave on string, Longitudinal Waves on Rod | Unit 3: Piezoelectric effect, Production of Ultrasonic waves: | Unit 3: Properties and applications of Ultrasonic Waves Reverberation, Sabine's formula | Unit 3: Acoustics of Buildings, factors affecting Acoustics of Buildings, Sound distribution in an auditorium | Unit 3: Bioacoustics Revision of Unit 3 Summary of all units. |
| | Sem III Theory | U1 path functions, carnot`s cycle | U1 Carnot`s engines and refrigerator | U1 coefficient of performance problems | U2 Carnot's theorem, second law of thermodynamics | U2 phase change, triple point of water, latent heat | U2 Otto engine, Petrol engine | U2 diesel engine, related problems | Unit 2 Maxwell's correction to Ampere's law, Maxwell's equations . | U3 entropy in irreversible process,problems | U3 T-S diagram, entropy | U3 Entropy of a perfect gas, Kelvin`s thermodynamic scale of temperature | U3 zero of absolute scale, perfect gas scale and absolute scale | U3 Problems | | |
| | Sem I Pract. | | | | | | | | | | | | | | | |
| | Sem V Pract. | | | | | | | | | | | | | | | |
| Week | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| *Dr. Vidyadhara Pendharkar* | Sem V Paper iii Theory | U1 Introduction and solving Hydrogen atom by STIE | U1 Physical interpretation, Electron probability densitye | U1 Electron Spin | U1 Revision | U2 Symmetric and Asymmetric wave function | U2 Vector atom model | U2 Origin of spectral line and selection rules. | U2 Revision | U3 effect of magnetic field and normal zeeman effect | U3 Lande G factor and anomalous zeeman effect | U 3 Paschen back effect and selection rules | U 3 Revision | Concept of linkage and crossing ove | Complete and incomplete linkage rossing over | Three point cross |
| | Sem I Theory | | | | Unit 1 Review of concept of elasticity Equivalence of shear strain to compression and extension strain | Unit 1 Equation of continuity, Bernoulli's equation | Unit 1 streamline and turbulent flow, lines of flow in air foil, Poiseuille's equation | Unit 1 Partial Differentiation Total Derivative, Partial Differentiation of Composite | Unit 2 Composition of two perpendicular S H M's having same period and period in the ratio 1:2, Lissajous | Unit 2 Centre of mass of a system of particles, Linear momentum of a system of particles and its | Unit 2 Angular momentum of a system of particles and its conservation (only statement). Rocket | Unit 2 General solution of wave equation, Classification of waves, Transverse wave on string, | Unit 3: Piezoelectric effect, Production of Ultrasonic waves: | Unit 3: Properties and applications of Ultrasonic Waves Reverberation, Sabine's formula | Unit 3: Acoustics of Buildings, factors affecting Acoustics of Buildings, Sound distribution in an auditorium | Unit 3: Bioacoustics Revision of Unit 3 Summary of all units. |

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| Dr. Jiten | | | | | | | | Function | figures. | conservation | motion | Longitudinal Waves on Rod | | | | |
| | Sem V Pract | | | | | | | | | | | | | | | |
| | MSc I Sem I Paper II | | | | P3 U1 Introduction | Postulates of QM | Postulates of QM | Initial value problem | Problem solving | superposition principle | Ensemble average | Commutators | Problems based on commutators | Commutators and HUP | Degeneracy | Time development of function and expectation value |
| Dr. Smita Survase | Sem III Paper II Theory | Introduction to syllabus and PO, CLOS | Negative feedback-principles, Gain, advantages | Positive feedback-oscillator, essentials of transistor oscillator and Barkhausen criterion for self-sustained oscillations, | Colpitt's oscillator, Wien bridge oscillator. CIA 1 | Schematic symbol, output voltage, ac analysis of op-amp, bandwidth, slew rate, | inverting amplifier, non-inverting amplifier, voltage follower | summing amplifier, integrator, differentiator | comparator with Zero reference and Non Zero reference CIA 2 | Implementation of logic circuit from truth tables: Sum of products and product of sums method | Combinational logic circuits: Karnaugh Map: truth table to Karnaugh Map, Pair, QUADs, OCTETs, don't care condition CIA 3 | R-S flip flops, clocked RS flip flop D Flip flop, | edge triggered J K flip flop, Master slave flip flop, T flip flop | 4-bit binary ripple counter | Decade counter CIA 4 | Revision |
| | Sem V paper II | Introduction to syllabus and PO, CLOS | Classical free electron theory of metals, Drawbacks of classical theory | Relaxation time, Collision time and mean free path, CIA 1 | Quantum theory of free electrons, FermiDirac statistics and electronic distribution in solids | Density of energy states and Fermi energy The Fermi distribution function, | Heat capacity of the electron gas, Mean energy of electron gas at 0 K, Electrical conductivity from quantum mechanical considerations | : A survey, Mechanism of Superconductors, Effects of magnetic field CIA 2 | The Meissner effect, the penetration depth, Type I and Type II Superconductors. | Band theory of solids, The Kronig-Penney model Brillouin zones, Number of wave functions in a band, | Motion of electrons in a one-dimensional periodic potential, Distinction between metals, insulators and intrinsic semiconductors | Electrons and Holes in an Intrinsic Semiconductor, Conductivity, Carrier concentrations, Donor and Acceptor impurities CIA 3 | Charge densities in a Semiconductor, Fermi level in extrinsic semiconductors, Diffusion, Carrier lifetime,The continuity equation, The Hall effect. | Qualitative theory of the p-n junction, The p-n junction as a diode, Band structure of an open-circuit p-n junction, | The current components in a p-n junction diode, Quantitative theory of p-n diode currents, The Volt-Ampere characteristics, CIA 4 | The temperature dependence of p-n characteristics, Diode resistance. Semiconductor nanoparticle: effect on band gap energy 57 |
| | Sem I Pract | | | | | | | | | | | | | | | |
| | MSc I Sem I Paper I | | | | | | | Introduction to syllabus and PO, CLOS | Properties of Fourier series, integral transforms, development of Fourier integrals, | Fourier transform of derivatives, convolution theorem. | Laplace transforms, Laplace transform of derivatives, CIA 1 | Inverse Laplace transform and Convolution theorem. | Matrices, Eigenvalues and Eigen vectors, Diagonalization of Matrices, Application to Physics problems | Applications to differential equations. Introduction to Tensor Analysis, CIA 2 | I, Addition and Subtraction of Tensors, summation convention | Contraction, Direct Product CIA 3. |
| Mr.Anshul Gupta | Sem V Paper i Theory | Module -1 statistical approach, Particle-states, Systemstates, Microstates and Macro states of a system. | Module-1 Equilibrium and Fluctuations, Irreversibility, The equiprobability postulate, | Module-1 Statistical ensemble, Number of states accessible to a system, Phase space. | Reversible processes. Phase space, The probability of a distribution, The most probable distribution | Module-1 Numerical Problems,applications and tutorials | Module-2 Thermal interaction, Canonical distribution, | Module-2 Energy fluctuations, Entropy of a system in a heat bath, Helmholtz free energy. | Module-2 Adiabatic interaction and enthalpy, General interaction and the first law of thermodynamics, | Module-2 Infinitesimal general interaction, Gibbs free energy, Phase transitions | Module-2 Numerical Problems,applications and tutorials | Module-3 Maxwell-Boltzmann statistics, | Module-3 Bose-Einstein statistics, Black-body radiation, The Rayleigh-Jeans formula, | Module-3 The Planck radiation formula, Fermi-Dirac statistics | Module-3 Comparison of results, Transition between states | Module-3 Numerical Problems,applications and tutorials |
| | Sem I Theory | | | | Module - III Introduction to logic, Basic Gates, Boolean Algebr | Module- III Introduction to logic, Basic Gates, Boolean Algebra | Module- III DeMorgan's Theorems, Boolean Algebra, Problems | Module- III XOR Gates, SOP,POS | Module- III Problems | Module -I: Review lectures and circuit analysis | Module -I Thevenin's theorem, Problems | Module - I Norton's theorem, problems | Module -I Maximum Power Transfer theorem, LR ,CR DC circuits | Module 2 | Module 2 | Module 2 |
| | Sem V Pract | | | | | | | | | | | | | | | |
| | Sem I Pract | | | | | | | | | | | | | | | |
| | MSc II Sem III Paper I | | | | | | Module- 3 Conservation laws, Center of Mass frame, Types of nuclear reaction,Q-value equation of nuclear reaction, | Module- 3 reaction cross sections (Classical and Quantum),Compound nuclear reaction | Module- 3 Introduction to fission reaction, Characteristics of Fission, Energy in Fission, Controlled fission reaction, Introduction to 3 stage- Nuclear programme of India, | Module- 3 Introduction to Fusion Reaction, Characteristics of Fusion, Solar Fusion and CNO cycle, | Module- 3 Introduction to Controlled fission reaction | Module -4 Introduction to the elementary particle Physics, The Eight fold way | Module -4 Quark Model, the November revolution and aftermath, The standard Model, Revision of The four forces, cross sections, decays and resonances, | Module -4 Quantum Electrodynamics, weak interactions and Unification Schemes (qualitative description). | Module -4 Revision of Lorentz transformations, Four-vectors, Energy and Momentum. Properties of Neutrino, helicity of Neutrino, Parity, , | Module -4 Qualitative discussion on Parity violation in beta decay and Wu"s Experiment, Charge conjugation, Time reversal, Qualitative introduction to CP violation and TCP theorem. |
| Mr. Deepak Jalla | Sem V DSE i Theory | U1: Temp. measurements | U1:Pressure & Displacement Transducer-s | U1:Optical Transducer-s | U1:Applications of Transducers | U2:Display devices | U2:BCD decoder/drivers | U2:Linear & switching regulators | U2:Basic & Monolithic Switching regulators | U3:Introduction to CRO | U3:Basic operation of CRO | U3:Analog to digital conversion methods | U3:Successive approximation method | Concept of linkage and crossing ove | Complete and incomplete linkage rossing over | Three point cross |
| | Sem III | | | | | | | | | | | | | | | |
| | MSc I Sem I Paper II | | | | | | | | U3:Introduction to Small oscillations | U3:Principal axis representation of the T and V matrices | U3:Application of Lagrangian formalism to various examples | U3:Forced & Damped Oscillations Hamilton's equations of motion | U4:Introduction to Canonical transformations | U4:Generators of Canonical transformations | U4:Symplectic approach | U4:Poisson bracket's and other Canonical invariants |
| Week | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| Mr. Deepak Jalla | MSc II Sem III Paper II | | | | | | | | U1:Overview of Nuclear Physics | U1:Nuclear properties | U1:Deuteron problem | U1:Shell & Nielson Model | U2:Introduction to radioactive decay | U2:Alpha decay | U2:Beta Decay | U2:Gamma decay |
| | | Introduction to | U1 transistor | U1 transistor | U1 transistor | U1 transistor | U1 transistor | U1 transistor | U1 transistor | U1 transistor | U1 transistor | U1 transistor | U1 transistor | U1 transistor | U1 transistor | Revision |

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| Mr. Amit More | Sem III Paper II Theory | syllabus, and CLO and PLO Revision of basic transistor action | Biasing | Biasing | Biasing | Biasing | Biasing | Biasing | amplifiers | amplifiers | amplifiers | amplifiers | amplifiers | amplifiers | amplifiers | |
| | Sem I Paper I | | | | U1 elasticity | U1 elasticity | U1 fluid dynamics | U1 revision | U2 composition of shms | U2 system of particles | U2 system of particles | U2 motion in 1d | U2 motion in 1d | U3 ultrasonics | U3 acoustics | U3 Biophysics |
| | Sem III Pract | | | | | | | | | | | | | | | |
| Dr. Pallavi Raote | SemIII Paper i Theory | L1: Unit I : Theory of errors : Significant digits and related numericals L2 & L3 Unit 2 : Damped vibrations: Introduction and general equation | L4 : Unit I : Theory of errors : Absolute and relative error,Types of error relative errors and significant digi. L5 & L6 : Types of Damped vibrations | L7: Unit 1 Theory of errors:random error and related study L8 & L9: Unit 2 Energy of damped vibrations and related numericals | L10: Unit 1 Estimation of errors :mean value of measurement, average error, L11 & L12: Unit 2 : Forced vibrations: Introduction, equation of motion, low driving frequency | L13 : Unit 1 Estimation of errors: Average error and standard error L14 & L15 Forced oscillation: high driving frequency, condition for resonance | L16 : Unit 1 :probable errors. Propagation of errors. L17 & L18 Unit 2 : Forced vibrationQuality factor of a driven oscillator & Numericals: | L19 : Test 1 L20 & L 21 : Unit 2 Compound pendulum: definition , expression for period and related topics | L22 : Unit 1 Data collection method: Activity L23 & L24 :Unit 2 reversible pendulum an related numericals | L25 : Unit 1 : Collection of primary data, Observation method L26 & L27 Unit 3 bending moment, Basic assumptions for theory of bending, cantilever | L28 : Unit 1 Data collection : Interview, questionnaires method L29 & L30: Unit 3 :beam supported at its ends determination of Y by bending, | L31 : Test 2 L32 & L33 Unit 3 Determination of elastic constants by Searle's method.+ Numericals | L34 :revision L35 & L36 Unit 3 collision : definition, frame of reference, relation between disp & velocity | L 37 & 38 Unit 3 relationship between angle, Numericals + revision test 3 | L40 : revision | |
| | Sem I Pract | | | | | | | | | | | | | | | |
| | Sem V Pract | | | | | | | | | | | | | | | |
| | MScII Sem III Paper IV | | | | P3 U1 Introduction | Postulates of QM | Postulates of QM | Initial value problem | Unit 1 : Introduction to Cpp,Basic syntax, simple Cpp program, compilation and running program | Unit 1: Expression and interactivity, control structure for decision making | Unit 1: loop control structure.array | Unit 1 :Cpp programs with functions | Unit 2 : Introduction to pointers in Cpp, use of pointers in programs | Unit 2: Structured data: abstract data type in Cpp | Unit 2: Introduction to classes and related programs | Unit 2 : Inheritance and polymorphism |
| Mr. Ketankumar Gayakwad | | | | | | | | | | | | | | | | |
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| Dr. Rucha Naik | Sem V Theory | Introduction to Data processing circuit and D/A conversion | Multiplexers, types, design | Probles based on designing Multiplexers | DeMultiplexers, types, design | Probles based on designing deMultiplexers | 1 of 16 decoder | BCD to decimal | 7 segment dispaly | encoders | Problems for designing decoders and encoders | Variable resistor Networks with examples | Binary ladders | D/A converters, DAC0707 | D/A accuracy and resolution | Revission |
| | Msc sem I Paper IV | | | | Classification of Semiconductors; Energy band structure of Si, Ge & GaAs; | Extrinsic and compensated Semiconductors; Temperature dependence of Fermi-energy and carrier concentration | Drift, diffusion and injection of carriers | Carrier generation and recombination processes-Direct recombination, Indirect recombination, Surface recombination | Applications of continuity equation-Steady state injection from one side, Minority carriers at surface, Haynes Shockley experiment, | Hall effect; Four – point probe resistivity measurement; Carrier life time measurement by light pulse technique. | Fabrication of p-n junction by diffusion and ion-implantation, Abrupt and linearly graded junctions | Thermal equilibrium conditions; Depletion regions; Depletion capacitance | Capacitance – voltage (C-V) characteristics, Evaluation of impurity distribution | Ideal and Practical Current-voltage (I-V) characteristics; Tunneling and avalanche reverse junction break down mechanisms | Metal – Semiconductor Contacts: Schottky barrier – Energy band relation | Capacitance-voltage (C-V) characteristics, Current-voltage (I-V) characteristics; Ideality factor, Barrier height and carrier concentration measurements |
| | Sem I Pract | | | | | | | | | | | | | | | |
| | MSc I Sem III Paper IV | Introduction to advanced processor design, architecture, timeline for processor desgin | The Acorn RISC Machine, Architectural inheritance | The ARM Programmer's model, ARM development tools. | Introduction to ARM Assembly language Programming | Data processing instructions and example programs | Data transfer instructions and example programs | Control flow instructions and example programs | Exceptions, Condition execution of instructions | Branch andBranchwith Link (B, BL), Branch, Branch with Link and eXchange (BX,BLX), Software Interrupt (SWI) | Half-word and signed byte data transfer instructions, Multiple register transfer instructions | Thumb bit in the CPSR, The Thumb programmer's model, Thumb implementation, Thumb applications, | 3 – stage Pipeline ARM organization | ARM instruction execution | ARM Processor Cores: ARM7TDMI | ARM Processor Cores: ARM7TDMI |
| Week | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| | | | | | | | | | Introduction to | Introduction to | MuP-MuC-DSP, | PLD,CPLD,FPGA | Memory Map, | Infinite loop, | types of os | Multitasking,task |

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| Dr. Rucha Naik | MSc II Sem III Paper IV | | | | | | | | embedded system, Embedded Vs. General Purpose computers | ARM Assembly language Programming | CISC-RISC.von-Neuman&Harvard, Endiness | ASIC, COTS,Sensors&Actuators,I/p&O/p devices, TypesOfMemories | Programming embedded systems:-Structure og embeded program | compiling,linking,IntroductionToOperating systems,Introducti onto RTOS | monolithic , microlithic , Real time OS concept,Task managements | sheduling, LIFO-FIFO, The embedded system design environment : The integrated development environment (IDE), Simulator , emulator, debugging |
| Dr. Shruti Barve | Sem I Paper ii Theory | | | | HWR, FWR and Bridge rectifier: Efficiency and Ripple factor | Filter: Capacitor, Choke i/p Number Systems | Number system convertion, Binary add, subtract | Logic gates, Universal Building blocks | UI Thevenin Thm, Maximum power thm | UI Norton`s thm, Reciprocity thm | UI General AC bridge, Maxwell,s | UI De-Sauty, Wien, Schering bridge | UIII Bridge rectifier, Filter circuit | UIII De-Morgan`s Theorem, NAND-NOR | UIII EX-OR Number system | UIII Addition subtraction, SOP, POS |
| | Sem I | | | | | | | | | | | | | | | |
| | Sem V SEC | Types of matrices | Transpose and Conjugate | Inverse of matrix: adjoint,singular matrix | Symmetric, Skew-, Hermitian matrices | Eigen values and vectors, Cayley-Hamilton | Diagonalization for solving problems | Introduction for Fourier tranform | Complex form of FS | Cosine and Sine transforms | Fourier tranform for derivative | Laplace transform, Derivative | Inverse Laplace and Convolution | | | |
| | MSc II Sem III Paper III | Intro: miroprocessor, microcontroller, | 8051 family, Harvard, CISC, RISC, | 8051: Pin out diagram, functions | registers: P c, DPTR, flags, PSW | Memory organization | reg for ports, timers, serial comm. And interrupts | Assembly programming syntax | U III Introduction to Atmel MUC, MCS-51 Addressing modes: examples | U III Memory organization and Detail and special instruction set | UIII I/O ports, Timer Programming: push button, LED | Interfacing: keybord | Interfacing: ADC, LCD | Programming: 7 segment display | Programming: DC motor | Revision and Doubt session |
| Ms. Ranjit Yadav | Sem V SEC Theory | SEC UNIT 1 Introduction of Matrice | Transpose of a Matrix. Symmetric and Skew-Symmetric Matrices | Conjugate of a Matrix. Hermitian and Skew-Hermitian Matrices. Singular and Non-Singular | Adjoint of a Matrix. Inverse of a Matrix by Adjoint Method. Orthogonal and Unitary Matrices. | Trace of a Matrix. Eigen-values and Eigenvectors. Cayley- Hamilton Theorem. Diagonalization of | UNIT 2 Fourier transforms: IntroductionFormal development of the complex Fourier | Cosine and Sine transforms, | The transforms of derivatives. | Laplace transforms, Laplace transform of derivatives, | Inverse Laplace transform and Convolution theorem. | | | | | |
| | Sem I | | | | | | | | | | | | | | | |
| | Sem I Theory | | | | | Thevenin`s Thm and Reciprocity thm | Norton`s Thm and Maximum power transfer thm | Intro: Transient, R, L, C, Series LR, Series CR | Transient: Series LCR Growth and Decay | AC: R, L, C, Series LR, Series CR | LCR resonance, Series and parallel, | | | | | |
| | MSc I Sem I Paper III | | | | Postulates of Q.M, Time dependent Schrodinger equation, state function | Solution to initial value problem, Superposition and Commutation. | commutation relations, Time development of state functions. | Dirac notation, Hilbert space, Hermitian operators | Dirac notation, Hilbert space, Matrix mechanics | Basis and representation, matrix properties | Unitary and similarity transformation | Unit 3 general properties of 1D box | Particle in a box , unbound states | Finite potential well, Harmonic oscillator | Unit 4 Schrodinger equation 3 d solutions | Orbital angular momentum |
| | Sem III Pract | | | | | | | | | | | | | | | |

## DEPARTMENT OF PHYSICS ACADEMIC PLAN 2022-23
## EVEN SEMESTER

| Week | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Name | Sem/ paper | "07/11/2022-12/11/2022" | 14/11/2022-19/11/2022 | 21/11/2022-26/11/2022 | 28/11/2022-03/12/2022 | 05/12/2022-10/12/2022 | 12/12/2022-17/12/2022 | 19/12/2022-24/12/2022- | 02/01/2023-07/01/2023 | 09/01/2023-14/01/2023 | 16/01/2023-21/01/2023 | 23/01/2023-28/01/2023 | 30/01/2023-04/02/2023 | 06/02/2023-11/02/2023 | 13/02/2023-18/02/2023 | 20/02/2023-25/03/2023 |
| Dr | Sem. VI | Unit I Transistor as a | Unit I Bistable | 555 Timer: Block diagram, | Unit I Triggered linear | Unit II Differential | Unit II CMRR | Unit II First order Active | Unit II Instrumentation | Unit III (JFET): Basic | Unit III CS amplifier, | Unit III Depletion mode, | Unit III Enhancement | | | |

| Week | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
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| Dr. Deepak More | Sem. VI Theory | Central forces, Introduction, Inverse square law derivation, Problems | Kepler's Laws, Derivation, Problems | Accelerated Frames, Coriolis Theorem Derivation, Centrifugal force, problems | Coriolis forces derivation, Cyclon formation, Foucault Pendulum, Problems | Constraints, Degrees of freedom, Generalised Coordinates, Examples | D'Alembert's Principle, Problems | Lagrangian Equation of motion, Problems | Ignorable/Cyclic coordinates, Conservation laws, problems | Fluid Mechanics, Problems | Fluid Mechanics, Problems | Moment Of Inertia, Tensor Formulation, Problems | Rigid body rotor, Euler Angles, Problems | | | |
| | Sem. II PG Theory | Angular Momentum Formulation in QM, Different Representations, | Commutator Relationship, Eigen functions | Matrix representation of angular momentum | Spherical Harmonics, Ladder Operators, Matrix,Spin | Addition of Angular Momentum, Clebsh Gorden Coefficients | Problems | Perturbation-Introduction, Classification. Time Independent Perturbation theory (PT), Non-Degenerate PT | Problems, Matrix eigen values, Particle in Infinite Potential Well, Harmonic Oscillator | Degenerate PT, Problems, Matrix eigen values, Particle in Infinite Potential Well, Harmonic Oscillator, Stark effect | Degenerate PT, Problems, Matrix eigen values, Particle in Infinite Potential Well, Harmonic Oscillator, Stark effec | Schrodinger and Heisenberg Pictures, Time Dependent Perturbation theory | Schrodinger and Heisenberg Pictures, Time Dependent Perturbation theory | | | |
| | Sem III Pract | | | | | | | | | | | | | | | |
| | Sem VI Theory. | Unit 1 Introduction to Special Theory of relativity Galilean transformations, Attempts to locate absolute frame: | Unit 1 Michelson- Morley experiment Attempts to preserve the concept of a preferred ether frame | Unit 1 Lorentz fitzgerald contraction hypothesis ether drag hypothesis | Unit 1 Attempt to modify electrodynamics, postulates of the special theory of relativity. Revision of Unit 1 | Unit 2 The relativity of Simultaneity, Derivation of Lorentz transformation equations | Unit 2 length contraction, time dilation and meson experiment, The relativistic addition of velocities | Unit 2 Mechanics and Relativity, Relativistic momentum The relativistic force law | Unit 2 dynamics of a single particle The equivalence of mass and energy, The transformation properties of momentum, energy and mass. | Unit 3 The interdependence of Electric and Magnetic fields, The Transformation for E and B | Unit 3 The field of a uniformly moving point charge , Force and fields near a current-carrying wire, Force between moving charges | Unit 3 Space-Time Diagrams Simultaneity, Length contraction | Unit 3 Time Dilation, twin paradox | Revision | Revision | Revision |
| | Sem I | | | | | | | | | | | | | | | |

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| | MSc Theory Sem II | Unit 2 Electromagnetic waves in vacuum Polarization of plane waves | Unit 2 Electromagnetic waves in matter Frequency dependence of conductivity, | Unit 2 Frequency dependence of polarizability, refractive index | Unit 2 Wave guides Boundary conditions | Unit 2 Classification of fields in wave guides | Unit 2 Phase velocity and group velocity Resonant cavities | Unit 3 Moving charges in vacuum Gauge transformation | Unit 3 The time dependent Green function The Lienard-Wiechert potentials and fields | Unit 3 Radiation from a charged particle Antennas | Unit 3 Radiation by multipole moments Electric dipole radiation | Unit 3 Complete fields of a time dependent electric dipole | Unit 3 Magnetic dipole radiation | Revision | Revision | Revision |
| *Mr.A.M. Shaker* | Sem IV Theory | U-1 Concept of wave, Concept of operators | U-1 Eigenvalues,Schro dinger equation | U-1 Time independent Schrodinger equation, | U1 Continuity equation and problems | U-2 Particle in infinitely deep potential well | U-2 Step potential | U 2 Particle in 3 dimension rigid box | U2 Problems | U 3 Barrier potential | U 3 Penetration and tunneling effect | U- 3 Alpha particle decay | U 3 Harmonic oscillator, correspondence principle | | | |
| | Sem I Theory | U1 Atomic physics Nuclear atom, Electron orbit, Bohr atom | U1 Atomic physics spectra, Correspondence principle, Nuclear motion | U1 X rays Continuous and characteristics X ray, X ray diffraction | U1 X rays Bragg's law, diffractomete | U 2 Nuclear Physics Composition and properties, stable nuclei | U2 Nuclear Physics B E, meson theory, problems | U2 Radioactivity Decay, types of decay, Half life, | U 2 Radioactivity derivation of successive disintegration, equilibrium, problems. | U 3 Introduction to QM 1 De broglie, Wave functions, particle diffraction | U3 Introduction to Q M 1 Davission Germer experiments, HUP | U 3 Introduction to Q M 2 Compton effect, Pair production | U 3 Introduction to Q M 2 Photons and gravity, Gravitational red shift | | | |
| | Sem I | | | | | | | | | | | | | | | |
| | Sem V Pract. | | | | | | | | | | | | | | | |
| *Dr. Jitendra Pendharkar* | F Y Sem 2 P1 Theory | Introduction to Modern physics and CLOs | Unit 2 Radioactivity | Unit 2 Radioactivity | Unit 2 Nuclear physics | Unit 2 Nuclear physics | Unit 1 Atomic Physics | Unit 1 Atomic Physics , | Unit 1 X rays | Unit 1 X rays | U3 Introduction to Q M 1 Davission Germer experiments, HUP | U 3 Introduction to Q M 2 Compton effect, Pair production | U 3 Introduction to Q M 2 Photons and gravity, Gravitational red shift | | | |
| | Sem. VI P3 Theory | U1 Alpha decay disintegration energy, laws, ionization, stopping power | U1 Alpha decay G N law, Gamow theory | U 1 Alpha decay and Nuclear reaction Problems, Types of nuclear reactions | U1 Nuclear Reaction Q value derivation ,Eth and problems | U 2 Beta Decay Types of beta, energetics of beta decay, spectrum, Neutrino hypothesis | U 2 Beta decay Cowans reine experiment, problems | U 2 Beta decay and gamma decay problem solving, Gamma decay, IC | U 2 Gamma Decay Isomerism, Mossoboer effect | U 3 Radiation detectors properties of counter, scintillation detectors | U 3 Radiation detectors IC, G M Counter | U 3 Liquid drop model semi empirical mass formula, mass parabolas, stability | U3 Liquid drop model stability limit against fission, mirror nuclei. | | | |
| | Sem V Pract | | | | | | | | | | | | | | | |
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| | Week | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| *Dr. Smita Survase* | Sem II Theory | Classification of materials, organic, semiconductor materials,Material structure and examination, Selection of materials. | Definitions of nano materials, size dependent properties of nano materials, alternate approaches of preparations of nano materials, synthetic strategies | Crystals, , lattice point and space lattice. Unit cell, primitive cell, Atomic radius, Direction lattice planes, Miller indices, Inter-planer spacing. | Introduction, transition between atomic energy states (without derivation), Principle of Laser, Properties of Laser, | Types of Lasers, Helium–Neon Laser, Application of Laser to Holography and other applications | Light propagation through Fibers, Fiber Geometry, Internal reflection, | Numerical Aperture, Step-Index and Graded-Index Fibers, Applications of Fibers | History & scope of biophysics, biological fluids, physico-chemical properties | viscosity, surface tension, pH, osmosis, osmotic pressure, diffusion,Thermod ynamics approach to bio Physics, Laws of thermodynamics and living organisms | First and Second law of thermodynamics, comparison of living and non-living systems as a thermodynamics system | Basic Astro-Physics: Planck's Theory of Radiation, Photoelectric effect, Pressure of Radiation, Type of Spectrum, Doppler Effect | Large Scale Structure of the Universe: Introduction, Structural Hierarchy, Hubble's law, Radiation Background, Life cycle of star | Large Scale Structure of the Universe: Introduction, Structural Hierarchy, Hubble's law, Radiation Background, Life cycle of star | | |
| | Sem VI Pract | | | | | | | | | | | | | | | |
| | Sem II Pract | | | | | | | | | | | | | | | |
| | Sem Iv paper II | Introduction to syllabus and PO, CLOS | Triple products, the □ operator, the gradient, divergence and the curl, product rules. | The fundamental theorem of gradient divergence and curl, spherical polar coordinates, CIA 1 | one dimensional and three dimensional Dirac-delta function. Integration of vectors: line integral, surface integral, | volume integral of vector field. Gauss-divergence theorem and Stokes theorem of vectors | Introduction, Coulomb's Law, The Electrical Field, Continuous charge distribution, electric potential, introduction to potential, | comments on potential, the potential of a localized charge distribution. CIA 2 | The work done in moving a charge, the energy of a point charge distribution, the energy of continuous charge distribution | The Biot-Savart law, applications of Biot-Savart law, Magnetic field due to a current carrying straight wire | Kinetic energy of a charged particle in an electric field, motion of a charged particle in a constant electric field, Charged particle in an alternating electric field | Thomsons parabolas and positive ray analysis. Force on a charged in a magnetic field. Charged particle in a uniform and constant magnetic field, The Cyclotron, Velocity | Parallel electric and magnetic field CIA 4 | Crossed electric and magnetic field, Bainbridge mass spectrometer. | revission | |
| *Mr.Anshul Gupta* | Sem. II Theory | Classification of materials, organic, semiconductor materials,Material structure and examination, Selection of materials. | Definitions of nano materials, size dependent properties of nano materials, alternate approaches of preparations of nano materials, synthetic strategies | Definitions of nano materials, size dependent properties of nano materials, alternate approaches of preparations of nano materials, synthetic strategies | Introduction, transition between atomic energy states (without derivation), Principle of Laser, Properties of Laser, | Types of Lasers, Helium–Neon Laser, Application of Laser to Holography and other applications | Light propagation through Fibers, Fiber Geometry, Internal reflection, | Numerical Aperture, Step-Index and Graded-Index Fibers, Applications of Fibers | History & scope of biophysics, biological fluids, physico-chemical properties | viscosity, surface tension, pH, osmosis, osmotic pressure, diffusion,Thermod ynamics approach to bio Physics, Laws of thermodynamics and living | First and Second law of thermodynamics, comparison of living and non-living systems as a thermodynamics system | Basic Astro-Physics: Planck's Theory of Radiation, Photoelectric effect, Pressure of Radiation, Type of Spectrum, Doppler Effect | | | | |
| | MSc SEM IV | Module 3 Theory of accelerator VDG | Module 3 SL LINAC | Module 3 Cyclotron Synchrotron | Module 3 LHC | Module 4 UV VIS RAMAN | Module 4 MOSS SPEC | Module 4 MOSS SPEC | Module 4 FTIR | Module 4 XRD | Module 4 SEM TEM EDAX | Module 4 XPS XRF | Module 4 XPS XRF | | | |
| | Sem V Pract | | | | | | | | | | | | | | | |

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| | Sem I Pract | | | | | | | | | | | | | | | |
| *Mr. Deepak Jalla* | | | | | | | | | | | | | | | | |
| | Sem III | | | | | | | | | | | | | | | |
| | Sem VI DSE1 | U1:Microprocessors, microprocessor instruction set and computer languages | U1:Microprocessor architecture and its operations | U1:Microprocessor architecture and its operations | U1:The 8085 microprocessor microprocessor communication and bus timings | U2:8085 programming model | U2:instruction classification, instruction and data format | U2:addressing modes for 8085 | U2:simple programs | U3:Looping, counting and indexing | U3:additional arithmetic and data transfer instructions | U3:arithmetic operations related to memory | U3:logical operators,delays and stacks | | | |
| | Msc Sem II P3 | U3:Introduction to variational principle | U3::Use of Variational principle further examples | U3::Use of Variational principle further examples | U3:The WKB approximation | U3:Turning point & connection formula | U3:Applications of the WKB approximation | U4:Scattering Theory. Scattering Amplitude | U4:Scattering Cross Section | U4:Born Approximation and its validity | U4:Partial wave analysis | U4:Optical Theorem | U4:Applications to repulsive hard sphere scattering in low and high energy regimes | | | |
| *Mr. Amit More* | | | | | | | | | | | | | | | | |
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| *Dr. Pallavi Raote* | Sem. IV Theory P1(Optics) | Unit 3 Resolving power : Introduction, Rayleigh's criteria | Unit 3 Resolving power of optical instrument: Telescope | Unit 3 Resolving power of prism and grating, numericals | Unit 3 : Michelson Interferometer: Principle, construction | Unit 3 :Michelson Interferometer : Working, formation of fringes | Unit 3 : Michelson interferometer : formation of fringes, visibility of fringes | Unit 3 : Michelson interferometer: application wavelength and difference measurement, related numericals | Unit 3 : Michelson interferometer: application: thickness of thin film and RI measurement, related numericals | Unit 3 : Michelson interferometer : Gravitational wave detection (LIGO) | Unit 3 :Fabry-Perot interferometer and etalon: Construction and working | Unit 3 : Fabry-Perot interferometer Formation of fringes, | Unit 3 : Fabry-Perot interferometer: (ii)determination of wavelength, Measurement of difference in wavelength | Revision | | |
| **Week** | | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** | **13** | **14** | **15** |
| *Dr. Pallavi Raote* | Sem I Pract | | | | | | | | | | | | | | | |
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| | Sem. VI Theory DSE II C programming | Unit 1 Fundamental of Computing, different types of Programming Languages steps in the Programming Process | Unit 1 : Pseudocode and flowchart | Unit 1 : Getting Started with C, Constants, Variables and Keywords. The First C Program, compiling and running . | Unit 1: C Instructions, Type Declaration Instruction, Arithmetic Instruction, Integer and Float Conversions | Unit 2 :Decision making control structures and related programs | Unit 2 : Looping control structures and related programs | Unit 2 : Derived data types : array , string as array of char, string library and related program | revision program and program presentation by students | Unit 3 : Function, declaration, prototyping, function definition, scope of variable, calling function | unit 3: calling function by value, calling function by reference, Recursive function calls, Tail recursion | Unit 3 Pointers, definition, syntex, referencing and dereferencing, related program | unit 3 : pointer and functions, related programs | revision and students presentation of program | | |
| *Mr. Ketankumar Gayakwad* | UG Sem. II Theory | Classification of materials, organic, semiconductor materials,Material structure and examination, Selection of materials. | Definitions of nano materials, size dependent properties of nano materials, alternate approaches of preparations of nano materials, synthetic strategies | Definitions of nano materials, size dependent properties of nano materials, alternate approaches of preparations of nano materials, synthetic strategies | Introduction, transition between atomic energy states (without derivation), Principle of Laser, Properties of Laser, | Types of Lasers, Helium–Neon Laser, Application of Laser to Holography and other applications | Light propagation through Fibers, Fiber Geometry, Internal reflection, | Numerical Aperture, Step-Index and Graded-Index Fibers, Applications of Fibers | History & scope of biophysics, biological fluids, physico-chemical properties | viscosity, surface tension, pH, osmosis, osmotic pressure, diffusion,Thermodynamics approach to bio Physics, Laws of thermodynamics and living | First and Second law of thermodynamics, comparison of living and non-living systems as a thermodynamics system | | | | | |
| | PG Sem II Theory | Unit-1 (1)Maxwell's equations, (2)The Pointing vector-Conservation of energ | (3)Poynting vector-Conservation of linear momentum (4) The Maxwellian stress tensor | (5)Problem solving-1 (6)Problem solving-2 | (7)The Maxwellian stress tensor (8)Lorentz Transformations, | (9)Four Vectors and Four Tensors (10)The field equations | (11)the field tensor (12)Maxwell equations in covariant notation. | Unit-4 (1)Relativistic covariant Lagrangian formalism: (2)Problem solving | (3)Formulation of relativistic lagrangian for a charged particle. (4)Problem solving. | (5)Covariant Lagrangian formalism for relativistic point charges (6) Problem solving | (7)The energy-momentum tensor (8)Problem solving | (9)Conservation laws (10) Problem solving | (11)Revision (12)Problem solving | | | |
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| | | Unit 1 Fundamental of Computing, different types of | Unit 1 : Pseudocode and flowchart | Unit 1 : Getting Started with C, Constants | Unit 1: C Instructions, Type Declaration | Unit 2 :Decision making control structures and | Unit 2 : Looping control structures and related | Unit 2 : Derived data types : array , string as array of | revision program and program presentation by | Unit 3 : Function, declaration, prototyping, | unit 3: calling function by value, calling function by | Unit 3 Pointers, definition, syntex, referencing and | unit 3 : pointer and functions, related programs | revision and students presentation of | revision | revision |

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| *Dr. Rucha Naik* | Sem VI Theory | different types of Programming Languages steps in the Programming Process | flowchart | Constants, Variables and Keywords. The First C Program, compiling and running . | Declaration Instruction, Arithmetic Instruction, Integer and Float Conversions | structures and related programs | and related programs | string as array of char, string library and related program | presentation by students | prototyping, function definition, scope of variable, calling function | calling function by reference, Recursive function calls, Tail recursion | referencing and dereferencing, related program | programs | presentation of program | | |
| | PG Sem. II Theory | Paper I Unit I Principles of Step up and Step down Switching Voltage converters | Paper I Unit I Analysis of buck converters. | Paper I Unit I boost converters | Paper I Unit I buck-boost converters | Paper I Unit I, Cuk converters | Paper I Unit I Isolated converters. | Paper I Unit III PLL VCO IC NE 566,, , | Paper I Unit III Phase Locked Loops | Paper I Unit III Analog multiplexer and de- multiplexer | Paper I Unit III D to A Converter Techniques | Paper I Unit III Multiplying DAC with Applications | Paper I Unit III R-2R ladder,,A to D Techniques, | Paper I Unit III Dual Slope ADC, Ramp ADC, | Paper I Unit III Successive approximation ADC, | Paper I Unit III half flash and flash ADC |
| | Sem I Pract | | | | | | | | | | | | | | | |
| | MSc II Sem IV Paper IV | Paper IV Unit II Introduction to ARM | Paper IV Unit II The ARM Architecture | Paper IV Unit III Introduction to ARM Assembly language Programming | Paper IV Unit III Writing ARM assembly language programs. | Paper IV Unit III Software Interrupt (SWI), Data processing instructions , | Paper IV Unit II Multiply instructions, Multiple register transfer instructions, | Paper IV Unit II Exceptions, Condition execution, | Paper IV Unit III B, BL Branch and Branch with Link | Paper IV Unit II ARM Organization and Implementation: | Paper IV Unit III 3 – stage Pipeline ARM organization, | Paper IV Unit III Execution ofall types of instructions | Paper IV Unit III Adder, multiplier, circuit | Paper IV Unit III Data floor plan, coprocessor | Paper IV Unit II Revision ARM PROGRAMS | Paper IV Unit II Revision ARM PROGRAMS |
| *Dr. Shruti Barve* | | | | | | | | | | | | | | | | |
| | Sem I Pract | | | | | | | | | | | | | | | |
| | Sem V Pract | | | | | | | | | | | | | | | |
| | MSc I Sem II Paper IV | U I Fine structure mathematical expression | U I Lamb shift and fine structure | U I Hyperfine structure and Isotope shift | U I Zeeman Effect Normal and problems | U I Zeeman Effect Anomalous Quantum theory | U I Paschen-Back, Stark Effect | U I 2 electron atom ground and excited states | U I 2 electron atom Exchange forces | U II Central field and Thomas Fermi potential | U II Hartree theory, multi-electron atom | U II Multi-electron atom, periodic table | U II LS Coupling and fine structure | UII JJ Coupling, Allowed terms, problems | UII LS and JJ coupling | Revision |
| | Week | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| *Dr. S. Barve* | Sem VI SEC | U I Present day renewable energy use and devices | UI Limitations and Side effects | UI Renewable energy: sustainable aspect | UI Hydroelectric, MHD power generation | UI Thermoelectric power | UI Thermionic power, Piezoelectric power | UII Solar energy Collectors | UII Storage and solar pond | UII Applications: Heater, Cooker, AC, photovoltaics | UII Historical background, Present use | UII Design of windmills | UII Electronic Interface and Application | Revision | | |
| *Ms. Ranjit Yadav* | Sem. II Theory | Paper I Unit I Nuclear atom, electronic orbits, atomic spectra | Bohr atom, energy levels, atomic excitation | X ray production, continuous and characteristic x ray spectra | X ray diffraction | Unit II Nuclear physics and relative properties | Nuclear Forces | radioactivity decay and their kinds | Successive disintegration | Unit III Introduction to Quantum Mechanics I | Davisson gerber experiment, Heisenbery Uncertainty Principle | Compton effect, pair production | photons and gravity | Gravitational red shift | | |
| | Sem I | | | | | | | | | | | | | | | |
| | MSC Sem. II Theory | Paper 4 Unit 4 Introduction to molecular spectra | MO, LCAO methods | Rotational spectra, Vibrational-Rotational Spectr | Raman rotational andVibrational spectra, | Electronic spectra of diatomic molecules: | General theory of NuclearMagnetic Resonance (NMR). | Unit 3 Interaction of one electron atoms with electromagnetic radiation | Electromagnetic radiation and its interaction with charged particles, | absorption and emission transition rates, | dipole approximation. | Einstein coefficients | selection rules. Line intensities and life times of excited state | Line shapes and line widths. | | |
| | MSC Sem IV Theory | | | | | Applied thermodynamics UNIT 1 thermodynamics properties | First law of thermodynamics and application | Second Law of thermodynamics and their entropy relations | Carnot theorem and Clausius inequality | Steady flow and unsteady flow | Temperature measurement techniques | Unit 2 Classification of material transformation | Solidification and melting transformation | Spinoidal, precipitatio | Order-disorder transformation, eutectoid | First and second phase transformations |
| | Sem III Pract | | | | | | | | | | | | | | | |