DEPARTMENT OF PHYSICS ACADEMIC PLAN 2021-2022
ODD SEMESTER

Week		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Name	Sem/ paper	14/06/2021-19/06/2021	21/06/2021-26/06/2021	28/06/2021-3/7/2021	5/7/2021-10/7/2021	12/7/2021-17/07/2021	19/07/2021-24/07/2021	26/07/2021-31/07/2021-	2/8/2021-7/8/2021	9/8/2021-14/08/2021	16/08/2021-21/08/2021	23/08/2021-28/08/2021	30/08/2021 4/9/2021	6/9/2021-12/9/2021	13/09/2021-18/09/2021	20/09/2021-26/09/2021
Dr.Meena Sharma	Sem. III Theory	Unit III SOP and POS method Karnaugh Map: TT to Karnaugh Map	KP:Pair, QUAD, OCTET Flip flops: RS Flip flop, clocked RS flip flop	Unit III D Flip flop, edge triggered J K flip flop,M/S flip flop,T flip flop	UNIT III 4-bit binary ripple counter ,Decade counter REVISION	Unit I Transistor fundamentals, transistor switch	Unit I Different methods of biasing method,, load line and Q-point	Unit I Transistor amplifiers(B-biasedE-biased,transistor model,	Unit I analyzing an amplifier REVISION	Unit II Negative feedback-principles, Gain, advantages	Unit II Positive feedbackColpitt's oscillator,Wien bridge oscillator	Unit II Opamp characteristics,applications	Unit II Opamp applications continued… Revision	Anthropogenic activities Reclamation/Destruction : oil, sewage & radiation.	Revision: Marine ecosystem	Revision: Physical & Chmemcial Oceanography
	Sem V Pract.															
	Sem III Pract.															
Dr. Deepak More	Sem I Theory				Unit III Introduction to logic, Basic Gates, Boolean Algebra	DeMorgan's Theorems, Boolean Algebra, Problems	XOR Gates, SOP,POS	Problems .	Unit-I: Review lectures and circuit analysis	Thevenin's theorem, Problems	Norton's theorem, problems	Maximum Power Transfer theorem, LR ,CR DC circuits	j vector, LR,CR AC circuits	Problems,LCR Series and Prallel Resonance	Q-factor,Oscillatro ciruits	Oscillator circuits and problems
	MSc Sem II Paper I Theory.								Unit I-Review of CM, Constraint, Problems .	Degree of Freedom, D'Alembert's Principle, Problems	E-L equation of motion, Problems	Variational Principle, EL equation of motion	Least Action principle, Lagrangian equation of motion	Conservation laws, Lagrange parameter, problems	Central forces definition, mathematical background	Equation of motion, Inverse Square field, Qualitative and Quantitative analysis
	Sem III Pract															
Dr.Geeta Nair	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 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, e	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.															
Mr.A.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. Jitendra 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 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 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 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 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 Pract															
	Sem I Pract															
	MSc II Sem III Paper III							8085 interrupts	Programmable Peripheral and Interface Devices:	Programmable Peripheral and Interface Devices:	Serial I/O and Data Communication	organization, architecture 8086 min/max modes	instruction format, Addressing Moses, instruction Set	Assembly language programming Examples	Introduction to Stack, Stack structure of 8086, interrupts and Interrupt Service Routines,	Interrupt cycle of 8086, Non-maskable interrupt, Maskable interrupt (INTR).
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
Mr. Amit More	Sem V Paper II Theory	SSP,Unit -1 Electrical properties of metals: introduction, success of	SSP,Unit -1 Electrical properties of metals: drawbacks of the classical theory	SSP,Unit -1 Electrical properties of metals: formulation of quantum free electron theory.	SSP,Unit -1 Electrical properties of metals: success of quantum free electron theory,	SSP,Unit -2: superconductivity.	SSP,Unit -2: BCS theory of superconductivity	SSP,Unit -2: Band theory of solids.	SSP,Unit -2: Band theory of solids, numericals.	SSP,Unit -3: conduction in semiconductor	SSP,Unit -3: conduction in semiconductor, Numericals	SSP,Unit -3: PN junction diode theory	SSP,Unit-3: Diode equation and numericals			
	Sem V Pract															
	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	Sem. III PG Theory	Unit:3: (1)Ideal gas in q.m. CE (2) Ideal gas in GCE	Unit:3: (3) Statistics of Occupation Numbers (4)Problem Solving	Unit:3: (5)Thermodynamic behaviour of ideal Bose Gas. (6)Phenomenon of BE condensation.	Unit:3 (7)Thermodynamic s of Blackbody radiation. (8)Problem solving	Unit:3 (9)Thermodynamic behaviour of ideal fermi gas (10)Concept of Fermi energy	Unit:3 (11)Behaviour of Sp.heat with temp. (12)Problem Solving.	Unit:4 (1)Brownian motion. (2) Brownian motion as a random walk.	Unit:4 (3)Diffusion process (4)Langven theory of Brownian motion	Unit:4 (5)Fluctuation-Dissipation theorem. (6)Master Equation	Unit:4 (7)Fokker-Planck equation (8)Spectral analysis of fluctuation.	Unit:4 (9)The W-K relations (10)Problem solving-1	Unit:4 (11)Problem solving-2 (12) Problem solving-3			
	Sem I PG Theory								(1)Matrices (2)Eigenvalues	(3)Eigen vectors (4)Diagonalization of Matrices	(5)Application to Physics problems (6)Applications to differential equations	(7). Introduction to Tensor Analysis (8) Addition and Subtraction of Tensors,	(9)summation convention (10)Contraction	(11)Direct Product (12)Levi-Civita Symbol		
	Sem. V Theory															
Dr. Rucha Naik	Sem V Theory	DSEII:- Unit I Multiplexers, Demultiplexers	DSEII:- Unit I 1-of-16 Decoder,BCD-to-decimal Decoders	DSEII:- Unit I, Seven segment Decoder,Encoders	DSEII:- Unit I D/A converters Variable resistor Networks, D/A accuracy and resolution.	DSEII:- Unit II Registers: Types of registers, .	DSEII:- Unit II Applications of Shift Registers	DSEII:- Unit II Counters: ·Ripple Counter, Synchronous Counters	DSEII:- Unit III Switching Circuits,Logic families: Standard TTL NAND	DSEII:- Unit III TTL NOR, Open collector gates	DSEII:- Unit III Three state TTL devices, MOS	DSEII:- Unit III CMOS NAND and NOR gates	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 Pract															
	Sem I Pract															
	MSc I Sem II Paper IV								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, Auger recombination	continuity Haynes Shockley experiment, High field effects. 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,	Ideal and Practical Current-voltage (I-V) characteristics; Tunneling and avalanche reverse junction break down mechanisms; Minority carrier storage, diffusion capacitance.	Metal – Semiconductor Contacts: Schottky barrier – Energy band relation, Capacitance-voltage (C-V) characteristics, Current-voltage (I-V) characteristics;

Week		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Dr. Rucha Naik	MSc II Sem III Paper IV								Introduction to embedded system, Embedded Vs. General Purpose computers	Introduction to ARM Assembly language Programming	MuP-MuC-DSP, CISC-RISC.von-Neuman&Harvard, Endiness	PLD,CPLD,FPGA ASIC, COTS,Sensors&Actuators,I/p&O/p devices, TypesOfMemories	Memory Map, Programming embedded systems:-Structureog embeded program	Infinite loop, compiling,linking,IntroductionToOperating systems,Introductionto RTOS	types of os monolithic , microlithic , Real time OS concept,Task managements	Multitasking,task sheduling, LIFO-FIFO, The embedded system design environment : The integrated development environment (IDE), Simulator , emulator, debugging
Dr. Shruti Barve	Sem I Paper ii Theory								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 Pract															
	MSc I Sem II Paper IV	Unit 1 2-electron atom in ground and excited state (3L)	Unit 2 Hartree Theory and Multielectron atom (3L)	Unit 2 Central Field and Thomas Fermi model (3L)	Unit 2 LS and JJ coupling (3L)											
	MSc I Sem I Paper I								U I Fourier Series (5L)	U I Fourier Transform (4L)	U I Laplace Transform (4L)	U I Inverse Laplace Transform (3L)	UIV PDE and Separation of variables (3L)	UIV Frobenius method (4L)	UIV Legendre Polynomials (4L)	U IV Bessel, Hermite equation (4L)
	MSc II Sem III Paper III								U III Introduction to Atmel MUC, MCS-51 Architecture (3L)	U III Memory organization and registers (3L)	UIII I/O ports, Timer and Counters (5L)	U III Assembly language programming (3L)	U IV Addressing modes Programming practice (4L)	U IV Serial communication, port programming (4L)	U IV Timer counter programming (3L)	U IV BU IV Interrupt priority, handling and programming (3L)
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 transform	Cosine and Sine transforms,	The transforms of derivatives.	Laplace transforms, Laplace transform of derivatives,	Inverse Laplace transform and Convolution theorem.					
	Sem I															
	Sem III Theory	Paper I Unit I Introduction of Matrices	Inverse of matrix	simultaneous equations	First order Differential equation	Second order Differential equations	complementry solutions	Particular solution	integration first principle	Integration by parts	Integration in the plane polar co-ordinates					
	MSc I Sem I Paper III								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 2021-2022
EVEN SEMESTER

Week		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Name	Sem/ paper	15/11/2021-20/11/2021	22/11/2021-2611/2021	28/11/2021-04/12/2021	06/12/2021-11/12/2021	13/12/2021-18/12/2021	20/12/2021-24/12/2021	03/01/2022-08/01/2022-	10/01/2022-15/01/2022	17/01/2022-22/01/2022	24/01/2022-29/01/2022	31/01/2022-05/02/2022	07/02/2022-12/02/2022	14/02/2022-19/02/2022	21/02/2022-26/02/2022	28/02/2022-05/03/2022
Dr.Meena Sharma	Sem. VI Theory	Unit I Transistor as a Switch Astable, Monostable and	Unit I Bistable MV,Schmitt trigger	555 Timer: Block diagram, Monostable and Astable operation	Unit I Triggered linear ramp generator REVISION	Unit II Differential Amplifier using transistor:, DC and AC analysis, Input characteristics ,	Unit II CMRR Op Amp Applications: Introduction, Log amplifier,	Unit II First order Active filters,, Band pass Filters, band rejection filter, ,	Unit II Instrumentation Amplifier Problems and REVISION	Unit III (JFET): Basic ideas, Characteristic curves, Biasing in the ohmic and active region,	Unit III CS amplifier, Analog switch multiplexer, voltage controlled resistor, Current sourcing.	Unit III Depletion mode, MOSFET operation and characteristics, digital switching	Unit III Enhancement mode, MOSFET operation and characteristics, digital switching REVISION			
	Sem III															
	Sem II PG	Unit II ideal and practical Op Amp, Linear application Instrumentation Amplifier	Unit II V-I and I-V converter Nonlinear appln: V-Comparator,	Unit II Precision Rectifier Analog Switches, S and H Amplifier	Unit II Voltage Follower Log/Antilog Amplifier, Analog Multiplexer. Revision	Unit IV Introduction to optical fibers,Types,advantages of optical fiber communication, applications	Unit IV Modes, EM mode theory, single and multimode optical fibers.	Unit IV Coherent and Non-Coherent sources, QE,LED, Laser diodes	Unit IV Detectors: PIN, ADP, noise analysis Revision							

Week		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
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															
Dr.Geeta Nair	Sem II Theory	Unit 1 Review of Bohr's Postulates Nuclear atom, Electron orbits, atomic spectra	Unit 1 energy levels and spectra, correspondence principle, nuclear motion	Unit 1 X-Rays production continuous and characteristic X ray spectra,	Unit 1 X-Ray Diffraction, Bragg's Law, Diffractometer Revision of unit 1	Unit 2 Nuclear composition, nuclear properties, Stable nuclei	Unit 2 Binding energy, Meson theory of nuclear forces.	Unit 2 Radioactive decay: Five kinds, Radioactivity and the Earth, Radiation Hazards, Half-Life	Unit 2 Radiometric Dating, Successive Disintegration , Radioactive Series and Radioactive Equilibrium	Unit 3 De Broglie Waves, Wave function, Particle Diffraction	Unit 3 Davisson Gerber Experiment, Heisenberg's Uncertainty Principle.	Unit 3 Compton Effect, Pair production	Unit 3 Photons and Gravity, gravitational red shift Revision of unit 3	Revision	Revision	Revision
	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															
	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
MrA.M. Shaker	Sem IV Theory	U-1 Concept of wave, Concept of operators	U-1 Eigenvalues,Schrodinger 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	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. 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															

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,Thermodynamics 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			
	Sem VI Pract															
	Sem II Pract															
	MSc II Sem IV Paper IV	VHDL Terms, Describing Hardware in VHDL, Entity, Architectures ,Concurrent Signal Assignment , Event Scheduling, Statement concurrency,	Structural DesignsSequential Behaviour, Process Statements, Proces Declarative Region,	Process Statement Part, Process Execution, Sequential Statements	Transport Delay, Inertial Delay Model, Transport Delay Model, Simulation Deltas	Block Statements Guarded Blocks	Sequential Processing: Process Statement, Sensitivity List, Process Example, Signal Assignment Versus Variable Assignment,	IF Statements, CASE Statements, LOOP statements, NEXT Statement, EXIT Statement, ASSERT Statement,	Data Types: Object Types, Signal, Variables, Constants, Data Types, Scalar Types	Composite Types, Incomplete Types File Types	Subprograms Function, Conversion Functions, Resolution Functions, Procedures	Entity-Architecture Pair Configuration, Port Map	Attributes Generic Value Specification in Architecture			
Mr.Anshul Gupta	Sem. II Theory	Module 1 X-Rays production continuous and characteristic X ray spectra, X-Ray Diffraction,	Module 1 Bragg's Law Diffractometer	Module 2 Nuclear composition, nuclear properties, Stable nuclei Problem solving	Module 2 Binding energy, Meson theory of nuclear forces	Module 2 Radioactive decay: Five kinds, Radioactivity and the Earth, Radiation Hazards, Half-Life and problem solving.	Module 2 Radiometric Dating, Successive Disintegration , Radioactive Series and Radioactive Equilibrium	Unit 3 De Broglie Waves, Wave function, Particle Diffraction	Unit 3 Davisson Gerber Experiment, Heisenberg's Uncertainty Principle.	Unit 3 Compton Effect, Pair production Photons and Gravity	Unit 3 gravitational red shift					
	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															
	Sem I Pract															
Mr. Deepak Jalla	Sem IV Theory	U2:distinction between interference and diffraction	U2:distinction between interference and diffraction	U2:distinction between interference and diffraction	U2:Fresnel and Fraunhoffer Types of diffraction,	U2:diffraction due to straight edge	U2:Fraunhofer diffraction at a single slit	U2:intensity distribution in diffraction pattern due to single slit	U2:intensity distribution in diffraction pattern due to single slit	U2:Fraunhofer diffraction at N slit	U2:Plane diffraction grating	U2:theory of plane transmission grating	U2:width of principal maxima, prism and grating spectra			
	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	Sem II Theory	UI Classification, Advanced materials	UI Properties and Synthesis of nano materials	UI Crystal Geometry Space lattices	UI Miller Indices Inter-planar spacings	UI Problems based on Crystal Lattices	UII Principal and Properties of Laser	UII Types of Laser, He-Ne laser	UII Application of Lasers and optical fibers	UII Types of optical fibers and Numerical aperture	UIII Biological fluid properties	UIII Laws of Thermodynamics to living organisms	UIII Structural Hierarchy, Radiation background	UIII Plank`s theory, Photoelectric effect	UIII Doppler Effect, Life cycle of star	Revision
	Sem V															
	Sem IV Theory	Unit 1 Introduction to vector algebra, scaler triple product	Unit 1 vector derivatives, gradient, divergence etc	Unit 1 divergence theorem, curl theorem	Unit 1 coordinate systems	Unit 2 electrostatics, electric potentials,	Unit 2 continuous and district charge distribution	Unit 2 magnetostatics, Biot savert law, its applications	Unit 2 applications of biot savert law, Heltmoz coil.	Unit 3 charge particle dynamics, uniform electric field	Unit 3 Motion of charge particle in ac electric field.	Unit 3 Motion of charge particle in uniform magnetic field	Unit 3 Motion of charge particles in cross electro magnetic field.	Revision		
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 Numericals	Revision		

Week		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Dr. Pallavi Raote	Sem I Pract															
	Sem. IV (PG) Theory Paper 3 (unit 1 and 2)	Unit 1 : PIC microcontroller overview and features, PIC architecture	Unit 1 :, PIC memory management, SRF and data memory	Unit 1: PIC instruction set, I/O Ports, Simple i?O programs												
	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	Unit 1 (1)Review of Bohr's Postulates (2)Nuclear atom, Electron orbits, (3) atomic spectra	Unit 1 (4)energy levels and spectra, (5)correspondence principle, (6)nuclear motion	Unit 1 (7)X-Rays production continuous and characteristic X ray spectra, (8)X-Ray Diffraction, Bragg's Law (9)Diffractometer	Unit 1 (10)Revision of unit 1 (11)Problem Solving (12)Problem Solving	Unit 2 (1)Nuclear composition, (2)nuclear properties, Stable nuclei (3)Problem solving	Unit 2 (4)Binding energy, (5)Meson theory of nuclear forces (6) Problem solving.	Unit 2 (7)Radioactive decay: Five kinds, Radioactivity and the Earth, (8)Radiation Hazards, (9)Half-Life and problem solving.	Unit 2 (10)Radiometric Dating, Successive Disintegration , (11)Radioactive Series and Radioactive Equilibrium (12)Revision.	Unit 3 (1)De Broglie Waves, (2)Wave function, (3)Particle Diffraction	Unit 3 (4)Davisson Gerber Experiment, (5)Heisenberg's (6)Uncertainty Principle.	Unit 3 (7)Compton Effect, (8) Pair production (9) Photons and Gravity	Unit 3 (10)gravitational red shift (11)Problem solving (12)Revision of unit 3			
	PG Sem II Theory	Unit-1 (1)Maxwell's equations, (2)The Pointing vector- Conservation of energ	(3)Poynting vector- Consrervation 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			
	PG Sem. IV Theory	Unit 2 (1)Thermodynamic properties of pure substances in solid, liquid and vapor phases (2)P-V-T behaviour of simple compressible	(3)phase rule (4)ideal and real gases	(5)equations of state (6)compressibility chart	(7)T-ds relations (8)Maxwells Equations	(9)Liquification of Gases (10)Joule-Thomson Effect	(11)Joule-Thomson Coefficient (12)Coefficient of volume expansion, adiabatic and isothermal compressibilities	(13)Clapeyron equation. (14)Revision.	Unit 3 (1)Equilibrium concept in Thermodynamics: Unary, binary, and multicomponent systems (2) Continue.	(3)phase equilibria (4)evolution of phase diagrams	(5)Calculation of Phase diagrams (6)Thermodynamics of defects	(7)Solution Models. (8)Thermodynamic Cycles:	(9)Carnot vapor power cycle (10)Ideal Rankine cycle	(11)Rankine Reheat cycle (12)Otto cycle	13)Diesel cycle (14)Revision	
Dr. Rucha Naik	Sem VI Theory	Paper I Unit I : Light waves,, interference,	Paper I Unit I superposition of waves	Paper I Unit I theory of interference,	Paper I Unit I techniques of obtaining interference	Paper I Unit I Interference in thin films	Paper I Unit I Newton's rings	Paper I Unit I Applications of thin film interference; Newton's ring (measurement of wavelength and refractive index)	Paper I Unit Polarization: Introduction,	Paper I Unit I type of polarization	Paper I Unit I polarization by reflection, Brewster's law,	Paper I Unit I polarization by double refraction, the phenomenon of double refraction,	Paper I Unit I Theory of λ/2 and λ/4 plates.	Paper I Unit I Revision Interference	Paper I Unit I Revision Polarization	Paper I Unit I Revision of Numerical of all topics
	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 PII Theory	UI Classification, Advanced materials	UI Properties and Synthesis of nano materials	UI Crystal Geometry Space lattice	UI Miller Indices Inter-planar spacings	UI Problems based on Crystal Lattices	UII Principal and Properties of Laser	UII Types of Laser, He-Ne laser	UII Application of Lasers and optical fibers	UII Types of optical fibers and Numerical aperture	UII Biological fluid properties	UIII Laws of Thermodynamics to living organisms	UIII Structural Hierarchy, Radiation background	UIII Plank`s theory, Photoelectric effect	UIII Doppler Effect, Life cycle of star	Revision
	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	UI 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	UI 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															