**Physics Lesson plan (2023-24) even sem**

**2nd sem**

Name : Komal Paper Code: 202

Class: B.Sc. 2 nd sem, section A

Subject: Electromagnetic induction and Electronic Devices

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| 15 Jan to 20 jan | Unit I: Growth and decay of current in a circuit with (a) Capacitance  and resistance (b) resistance and inductance |
| 22 jan to 27 Jan | c) Capacitance and inductance (d) Capacitance resistance and inductance.  AC circuit analysis using complex variables with (a) capacitance and resistance, |
| 29 Jan to 3 Feb | (b) resistance and inductance (c) capacitance and inductance (d) capacitance, inductance and  resistance Series and parallel resonant circuit. |
| 5 Feb to 10 Feb | Quality factor (Sharpness of resonance).Unit II  Semiconductor Diodes : Energy bands in solids. Intrinsic and extrinsic semiconductor |
| 12 Feb to 17 Feb | Hall effect, P-N junction diode and their V-I characteristics. Zener and avalanche breakdown.  Resistance of a diode, Light Emitting diodes (LED) |
| 19 Feb to 24 Feb | Photo conduction in semiconductors,photodiode, Solar Cell  Diode Rectifiers : P-N junction half wave and full wave rectifier. |
| 26 Feb to 2 March | Types of filter circuits (L and - Pi wiith theory). Zener diode as voltage regulator, simple  regulated power supply.Transistors : Junction Transistors, |
| 4 March to 9 March | working of NPN and PNP transistors, Transistor connections( C-B, C-E, C-C mode), constants of  transistor. Transistor characteristic curves (excluding h parameter analysis |
| 11 March to 16 March | advantage of C-B configuration. C.R. O. (Principle, construction and working in detail).Unit III Transistor Amplifers : Transistor biasing, methods of Transistor biasing and stabilization |
| 18 March to 22 March | D.C.load line. Common-base and common-emitter transistor biasing. Common-base, common-  Emitter amplifers. Classification of amplifers.Resistance-capacitance (R-C) coupled amplifer(two stage; |
| 1 April to 6 April | concept of band width, no derivation). Feed-back in amplifers, advantage of negative  feedback Emitter follower. Principle of Oscillation, Classification of Oscillator |
| 8 April to 13 April | Condition for self Sustained oscillation : Barkhousen Criterion for oscillations. Tuned collector common emitter Oscillator. Hartley oscillator. Colpitt’s oscillator unit test 3. |
| 15 April onwards | Doubt classes and revision classes. |

Name : Ritu Malik Paper Code: 202

Class: B.Sc. 2 nd sem, Section B & C

Subject: Electromagnetic induction and Electronic Devices

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| --- | --- |
| 15 Jan to 20 jan | Unit I: Growth and decay of current in a circuit with (a) Capacitance  and resistance (b) resistance and inductance |
| 22 jan to 27 Jan | c) Capacitance and inductance (d) Capacitance resistance and inductance.  AC circuit analysis using complex variables with (a) capacitance and resistance, |
| 29 Jan to 3 Feb | (b) resistance and inductance (c) capacitance and inductance (d) capacitance, inductance and  resistance Series and parallel resonant circuit. |
| 5 Feb to 10 Feb | Quality factor (Sharpness of resonance).Unit II  Semiconductor Diodes : Energy bands in solids. Intrinsic and extrinsic semiconductor |
| 12 Feb to 17 Feb | Hall effect, P-N junction diode and their V-I characteristics. Zener and avalanche breakdown.  Resistance of a diode, Light Emitting diodes (LED) |
| 19 Feb to 24 Feb | Photo conduction in semiconductors,photodiode, Solar Cell  Diode Rectifiers : P-N junction half wave and full wave rectifier. |
| 26 Feb to 2 March | Types of filter circuits (L and - Pi wiith theory). Zener diode as voltage regulator, simple  regulated power supply.Transistors : Junction Transistors, |
| 4 March to 9 March | working of NPN and PNP transistors, Transistor connections( C-B, C-E, C-C mode), constants of  transistor. Transistor characteristic curves (excluding h parameter analysis |
| 11 March to 16 March | advantage of C-B configuration. C.R. O. (Principle, construction and working in detail).Unit III Transistor Amplifers : Transistor biasing, methods of Transistor biasing and stabilization |
| 18 March to 22 March | D.C.load line. Common-base and common-emitter transistor biasing. Common-base, common-  Emitter amplifers. Classification of amplifers.Resistance-capacitance (R-C) coupled amplifer(two stage; |
| 1 April to 6 April | concept of band width, no derivation). Feed-back in amplifers, advantage of negative  feedback Emitter follower. Principle of Oscillation, Classification of Oscillator |
| 8 April to 13 April | Condition for self Sustained oscillation : Barkhousen Criterion for oscillations. Tuned collector common emitter Oscillator. Hartley oscillator. Colpitt’s oscillator unit test 3. |
| 15 April onwards | Doubt classes and revision classes. |

Name: Ms. Meena Yadav and Ms. Komal

Paper Code: PHY-201

Class: B.Sc. 2nd Sem

Subject: Properties of Matters, Kinetic Theory and Relativity

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| Jan 3rd Week | Unit I: Elasticity, Hooke’s law, Elastic constants, and their relations. |
| Jan 4th Week | Poisson’s ratio, torsion of cylinder and twisting couple. |
| Jan 5th Week and  Feb 1st Week | Bending of beam (bending moment and its magnitude) cantilevers, centrally loaded beam. |
| Feb 2nd Week | Unit II: Assumptions of Kinetic Theory of gases, Law of equipartition of energy and its applications  for specific heats of gases |
| Feb 3rd Week | TEST 1 OF UNIT 1; Maxwell distribution of speeds and velocities (derivation required). |
| Feb 4th Week | Experimental verification of Maxwell’s Law of speed distribution: most probable speed, average and rms speed, mean free path. |
| Feb 5th and  March 1st Week | Transport of energy and momentum, diffusion of gases. |
| March 2nd Week | ASSIGNMENT 1; Brownian motion (qualitative), Real gases, Van der Waal’s equation. |
| March 3rd Week | Unit III: Reference systems, inertial frames, Gallilean invariance and Conservation laws. |
| March 4th Week | TEST 2 OF UNIT 2; Newtonian relativity principle, Michelson - Morley experiment: Search for ether. |
| April 1st Week | Lorentz transformations length contraction, time dilation, velocity addition theorem. |
| April 2nd Week | Variation of mass with velocity and mass energy equivalence. |
| April 3rd Week | TEST 3 OF UNIT 3 ; ASSIGNMENT 2 |

Name: Rashmi Kakkar Class: B.Sc. 1st year (Home Science)

Paper Code: 202 Subject: Applied Physics

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| 1 Feb to 10 Feb | Unit 1: Properties of solids: Density, Specific gravity, elasticity, hardness, malleability, Properties of liquids: Surface tension, capillary action, Archimedes principle, specific gravity of liquids ductility. |
| 12 Feb to 17 Feb | Properties of gases: Elasticity, compressibility, atmospheric pressure  Unit test 1 and assignment |
| 19 Feb to 26 Feb | Unit 2: Simple machines – mechanical advantages, efficiency lever, screw pulleys, scissors, beaters. |
| 1 March to 8 March | Friction, advantages and disadvantages of friction, concept of ball bearing, sewing and floor scrubbing machines |
| 9 March to 16 March | Centripetal and centrifugal forces, spin dryer in washing machine, air appliances – Vaccum cleaner.  Unit test 2 and assignment |
| 18 March to 22 March | Unit3: Static and current electricity, basic electrical circuits, units of electrical measurement, Ohm’s law and parallel circuits, Thermal effect: thermoelectric thermometer, fuse, circuit breaker, toaster, geyser, hot plate, water heater, water boiler, steam iron. |
| 23 March to 31 March | Holi Vacation |
| 1 April to 6 April | House wiring: Transfer of energy from powerpoint to home, kilowatt hour, meter, distribution of current to the house, methods of installing the wiring circuits and switches. |
| 8 April to 13 April | Unit 4: Introduction to heat, unit of heat, source and properties of heat, heat and temperature, heat transfer, humidity, relative humidity and dew point  Application of heat transfer – household thermometers, pressure cooker, vacuum cleaner |
| 15 April to 20 April | Refrigeration – Refrigerator, compressor and absorption type, cold storage plants  Unit test 3, unit test 4 and assignment. |

**Lesson Plan 2023-24 (4th sem)**

Name: Meena

Class: B.Sc. 2ndyear

Paper Code: 401

Subject: Statistical Mechanics

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| Jan 4th week & Feb 1 week | Introduction to statistical mechanic, Probability, some probability considerations. |
| Feb 2nd week | Combinations possessing maximum probability and minimum probability, Distribution of molecules in two boxes, case with weightage |
| Feb 3rd week | Phase space, micro and macro states with distribution of particles, statistical fluctuations constraints and accessible states, thermodynamical probability. |
| Feb 4th week | Numerical problems, test and assignment of Unit 1. |
| March 1st week | Postulates of statistical physics, division of phase space into cells, Condition of equilibrium between two systems in thermal contact, β- parameter. |
| March 2nd week | Entropy and probability, Boltzman-distribution law, evaluation of A and β. |
| March 3rd week | Numerical problems, test and assignment of Unit 2 topics. |
| March 4th week | Holi Break |
| April 1st week | Bose Einstein statistics, application of Bose Einstein statistic to Planks radiation law, Bose Einstein gas, Fermi-Dirac statistics, MB-law as limiting case of BE degeneracy and Bose Einstein condensation. |
| April 2nd week | Fermi- Dirac gas, electron gas in metals, Zero point energy, Specific heat of metals and its solutions |
| April 3rd week | Numerical problems and quiz, Assignment submission, test |

Name: Rashmi

Class: B.Sc. 2ndyear

Paper Code: 401

Subject: Statistical Mechanics

|  |  |
| --- | --- |
| Jan 4th week & Feb 1 week | Introduction to statistical mechanic, Probability, some probability considerations. |
| Feb 2nd week | Combinations possessing maximum probability and minimum probability, Distribution of molecules in two boxes, case with weightage |
| Feb 3rd week | Phase space, micro and macro states with distribution of particles, statistical fluctuations constraints and accessible states, thermodynamical probability. |
| Feb 4th week | Numerical problems, test and assignment of Unit 1. |
| March 1st week | Postulates of statistical physics, division of phase space into cells, Condition of equilibrium between two systems in thermal contact, β- parameter. |
| March 2nd week | Entropy and probability, Boltzman-distribution law, evaluation of A and β. |
| March 3rd week | Numerical problems, test and assignment of Unit 2 topics. |
| March 4th week | Holi Break |
| April 1st week | Bose Einstein statistics, application of Bose Einstein statistic to Planks radiation law, Bose Einstein gas, Fermi-Dirac statistics, MB-law as limiting case of BE degeneracy and Bose Einstein condensation. |
| April 2nd week | Fermi- Dirac gas, electron gas in metals, Zero point energy, Specific heat of metals and its solutions |
| April 3rd week | Numerical problems and quiz, Assignment submission, test |

Name: Dr. Smriti Sharma

Class: B.Sc. 2nd year

Paper Code: 402

Subject: Optics-2

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| January 4th week & February 1st week | Introduction to Optics and brief discussion on interference. Brief introduction to Interference by division of amplitude, colour of thin films. |
| 2nd week | Wedge Shaped film, Newton’s ring , introduction to interferometers, Michelson’s interferometer, and its application. |
| 3rd week | Standardisation of a meter to determine wavelength, class test. Fresnel’s diffraction and half period Zones, Zone plate. |
| 4th week | Diffraction at a straight edge, rectangular slit and circular aperture and doubts regarding concepts. Numerical problems, test and assignment. |
| March 1st week | Introduction to Fraunhoffer diffraction , One slit diffraction , Two slit diffraction . N-slit diffraction, Plane transmission grating spectrum |
| 2nd week | Dispersive power of a grating & limit of resolution. Rayleigh’s criterion, Resolving power of telescope and a grating. Class Presentation and assignment submission. |
| 3rd week | Brief introduction to polarisation , polarisation and double refraction. polarisation by reflection. Polarisation by scattering, Malus law, phenomenon of double refraction, Huygen’s wave theory of double refraction. |
| 4th week | Holi break |
| April 1st week | Analysis of polarised light : Nicol prism, Quarter wave plate and half wave plate. Production and detection of plane polarised light. Class test. |
| 2nd week | Detection of Circularly polarised and elliptically polarised light. Optical activity. Fresnel’s theory of rotation and Specific rotation and introduction of polarimeters. Polarimeters : half shade polarimeter and Biquartz. |
| 3rd week | Revision and test |

Name: Dr. Abhilash

Class: B.Sc. 2nd year

Paper Code: 402

Subject: Optics-2

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| --- | --- |
| January 4th week & February 1st week | Introduction to Optics and brief discussion on interference. Brief introduction to Interference by division of amplitude, colour of thin films. |
| 2nd week | Wedge Shaped film, Newton’s ring , introduction to interferometers, Michelson’s interferometer, and its application. |
| 3rd week | Standardisation of a meter to determine wavelength, class test. Fresnel’s diffraction and half period Zones, Zone plate. |
| 4th week | Diffraction at a straight edge, rectangular slit and circular aperture and doubts regarding concepts. Numerical problems, test and assignment. |
| March 1st week | Introduction to Fraunhoffer diffraction , One slit diffraction , Two slit diffraction . N-slit diffraction, Plane transmission grating spectrum |
| 2nd week | Dispersive power of a grating & limit of resolution. Rayleigh’s criterion, Resolving power of telescope and a grating. Class Presentation and assignment submission. |
| 3rd week | Brief introduction to polarisation , polarisation and double refraction. polarisation by reflection. Polarisation by scattering, Malus law, phenomenon of double refraction, Huygen’s wave theory of double refraction. |
| 4th week | Holi break |
| April 1st week | Analysis of polarised light : Nicol prism, Quarter wave plate and half wave plate. Production and detection of plane polarised light. Class test. |
| 2nd week | Detection of Circularly polarised and elliptically polarised light. Optical activity. Fresnel’s theory of rotation and Specific rotation and introduction of polarimeters. Polarimeters : half shade polarimeter and Biquartz. |
| 3rd week | Revision and test |

**Lesson Plan 2023-2024 (6th Sem)**

Name: Dr. Sapana Kumari

Class: B.Sc. 3rd year

Paper Code: 601

Subject: Atomic, Molecular and Laser Physics

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| Jan. 3rd week | Introduction to atomic spectroscopy, Quantum numbers and space quantization, vector atom model, quantum numbers associated with vector atom model. |
| Jan. 4th week | Explanation of penetrating and non- penetrating orbits, spectral lines in different series of alkali spectra. Discussion on spin- orbit interaction, doublet term separation, LS coupling. |
| Feb. 1st week | Explanation of jj coupling, expressions for interaction energies for LS and jj coupling, Numerical problems, Test and Assignment |
| Feb. 2nd week | Explanation of normal and anomalous Zeeman effect, Zeeman pattern of D1 and D2 lines of Na atom. |
| Feb. 3rd week | Paschen- Back effect of a single valance electron system, weak field stark effect of hydrogen atom. |
| Feb. 4th week | Discrete set of electronic energies of molecules, quantization of vibrational and rotational energies. Description of Raman effect. |
| March 1st week | Stoke’s and anti-Stoke’s lines. Introduction to LASER, Main features of LASER: directionality, high intensity, high degree of coherence. |
| March 2nd week | Unit test. Einstein’s coefficients and possibility of amplification, momentum transfer. |
| March 3rd week | lifetime of a level. Kinetics of optical absorption, threshold condition for LASER emission. |
| March 4th week | Holi Break |
| April 1st week | LASER pumping. He-Ne LASER and Ruby LASER (principle, construction and working). |
| April 2nd week | Application of LASER in the field of medicine and industry. Unit Test |
| April 3rd week | Revision & Test discussion |

Name: Himanshi

Class: B.Sc. 3rd year (6th sem)

Paper Code: 601

Subject: Atomic, Molecular and Laser Physics

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| --- | --- |
| Jan 3rd week | Introduction to atomic spectroscopy, Quantum numbers and space quantization, vector atom model, quantum numbers associated with vector atom model. |
| Jan 4th and 5th week | Explanation of penetrating and non- penetrating orbits, spectral lines in different series of alkali spectra. Discussion on spin- orbit interaction, doublet term separation, LS coupling. |
| Feb 1st and 2nd week | Explanation of jj coupling, expressions for interaction energies for LS and jj coupling, Numerical problems, Test and Assignment |
| Feb 3rd week | Explanation of normal and anomalous Zeeman effect, Zeeman pattern of D1 and D2 lines of Na atom. |
| Feb 4th week | Paschen- Back effect of a single valance electron system, weak field stark effect of hydrogen atom. |
| Feb 5th week | Discrete set of electronic energies of molecules, quantization of vibrational and rotational energies. Description of Raman effect, Stoke’s and anti-Stoke’s lines, Unit test |
| March 1st and 2nd week | Introduction to LASER, Main features of LASER: directionality, high intensity, high degree of coherence. |
| March 3rd week | Einstein’s coefficients and possibility of amplification, momentum transfer, life time of a level. |
| March 4th week | Kinetics of optical absorption, threshold condition for LASER emission, LASER pumping. |
| April 1st week | He-Ne LASER and Ruby LASER (principle, construction and working), Application of LASER in the field of medicine and industry. |
| April 2nd and 3rd week | Revision & test |

Name : Dr. Geetanjali

Paper Code: 602

Class: B.Sc. 6th sem

Subject: Nuclear Physics

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| --- | --- |
| 15 Jan to 20 Jan | Unit 1: Nuclear mass and binding energy, systematics of nuclear binding energy, |
| 22 Jan to 27 Jan | Nuclear stability, Various properties of Nucleus: spin, parity, magnetic dipole moment, quadrupole moment. |
| 29 Jan to 3 Feb | Determination of mass by Bain Bridge and Jordan Mass spectrographs, |
| 5 Feb to 10 Feb | Determination of charge by Mosely law, Rutherford scattering. Numerical and unit 1 test |
| 12 Feb to 17 Feb | Unit :2, Interaction of charged particles (Alpha particles), Energy loss of heavy charged  particles, Alpha disintegration and its theory, |
| 19 Feb to 24 Feb | Energetics of alpha Decay, Range and straggling of alpha particles, Geiger-Nuttal law. |
| 26 Feb to 2 March | Introduction of light charged particle (beta particle), origin of continuous Beta spectrum (Neutrino Hypothesis), types of beta decay , energetics of beta decay, energy loss in beta  decay. |
| 4 March to 9 March | Gamma decay Interaction of Gamma rays through various ways, energetics of gamma decay, Absorption of gamma rays and its applications, numerical, and unit test-2 |
| 11 March to 16 March | Unit 3: General aspects of Nuclear reactors, fission and fusion reactors, linear and tandem accelerators, |
| 18 March to 22 March | Cyclotron and Betatron, ionisation and proportional counter, Gm Counter, |
| 23 March to 31 March | Mid Semester Break |
| 1 April to 6 April | Scintillation counter, Semiconductor counter, types of Nuclear reactions |
| 8 April to 13 April | Q-values and reaction threshold, conservation laws., assignment discussion , unit test 3. |
| 15 April onwards | Doubt classes. |

Name : Dr. Sushila srivastava

Paper Code: 602

Class: B.Sc. 6th sem

Subject: Nuclear Physics

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| --- | --- |
| 15 Jan to 20 Jan | Unit 1: Nuclear mass and binding energy, systematics of nuclear binding energy, |
| 22 Jan to 27 Jan | Nuclear stability, Various properties of Nucleus: spin, parity, magnetic dipole moment, quadrupole moment. |
| 29 Jan to 3 Feb | Determination of mass by Bain Bridge and Jordan Mass spectrographs, |
| 5 Feb to 10 Feb | Determination of charge by Mosely law, Rutherford scattering. Numerical and unit 1 test |
| 12 Feb to 17 Feb | Unit :2, Interaction of charged particles (Alpha particles), Energy loss of heavy charged  particles, Alpha disintegration and its theory, |
| 19 Feb to 24 Feb | Energetics of alpha Decay, Range and straggling of alpha particles, Geiger-Nuttal law. |
| 26 Feb to 2 March | Introduction of light charged particle (beta particle), origin of continuous Beta spectrum (Neutrino Hypothesis), types of beta decay , energetics of beta decay, energy loss in beta  decay. |
| 4 March to 9 March | Gamma decay Interaction of Gamma rays through various ways, energetics of gamma decay, Absorption of gamma rays and its applications, numerical, and unit test-2 |
| 11 March to 16 March | Unit 3: General aspects of Nuclear reactors, fission and fusion reactors, linear and tandem accelerators, |
| 18 March to 22 March | Cyclotron and Betatron, ionisation and proportional counter, Gm Counter, |
| 23 March to 31 March | Mid Semester Break |
| 1 April to 6 April | Scintillation counter, Semiconductor counter, types of Nuclear reactions |
| 8 April to 13 April | Q-values and reaction threshold, conservation laws., assignment discussion , unit test 3. |
| 15 April onwards | Doubt classes. |