2014-2015 SEM –I MECH-A ENGINEERING PHYSICS LESSON PLAN

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| **PERIOD** | **DATE**  **{Tentative}** | **TOPIC** | **UNIT**  **No** | **TEACHING**  **METHODOLOGY** | **REMARKS** | **CORRECTIVE**  **ACTION UPON**  **REVIEW** |
|  |  | **General Introduction** |  |  |  |  |
| 1 | 16-09-2014  (Tue) | The Basic differences between Intermediate and Professional College Education and Parity among the Institutes, the Departments and the Faculty | -- | -- |  |  |
| 2 | 17-09-2014  (Wed) | Broad perspective of Engineering Physics and Scope of the Syllabus – Teaching Methodology – Course Regulations | -- | -- |  |  |
|  |  | **Pre Requisites for 0ptics** |  |  |  |  |
| 3 | 18-09-2014  (Thu) | SHM and a Wave | -- | Lectures, Demonstration  Animations |  |  |
| 4 | 18-09-2014  (Thu) | Basic Terms Associated with a Wave. Time Period, Frequency, Wave Length, Amplitude etc. | -- | Lectures, PPT Demonstration  Animations,  Group Discussion |  |  |
| 5 | 19-09-2014  (Fri) | Superposition of Two Waves –  Resultant Amplitude and Resultant Phase | -- | ,, |  |  |
| 6 | 23-09-2014  (Fri) | What is Size of Light – Also the Size of Electromagnetic Spectrum  What is Coherence? Spatial and Temporal Coherence | -- | ,, |  |  |
| 7 | 30-09-2014  (Tue) | Huygen’s Principle and Wave Front – Wave Front Division and Amplitude Division to Achieve Coherence | -- | ,, |  |  |
| 8 | 01-10-2014  (Wed) | Phase Change on Reflection and Concept of Optical Path Equivalence | -- | ,, |  |  |
|  |  | **UNIT I - Interference** |  |  |  |  |
| 9 | 03-10-2014  (Fri) | Young’s Double Experiment | I | ,, |  |  |
| 10 | 07-10-2014  (Tue) | Conditions for the Interference | I | ,, |  |  |
| 11 | 08-10-2014  (Wed) | Thin Film Interference under Reflected System | I | ,, |  |  |
| 12 | 09-10-2014  (Thu) | Newton’s Rings under Reflected System | I | ,, |  |  |
| 13 | 09-10-2014  (Thu) | Newton’s Rings Continued…  Applications of Newton’s Rings | I | ,, |  |  |
| 14 | 10-10-2014  (Fri) | Problems on Interference and Revision | I | ,, |  |  |
|  |  | **UNIT I - Diffraction** |  |  |  |  |
| 15 | 14-10-2014  (Tue) | Introduction to Diffraction – Fresnel and Fraunhofer Diffraction  Difference Between the Interference and Diffraction | I | ,, |  |  |
| 16 | 15-10-2014  (Wed) | Fraunhofer Diffraction at Single Slit | I | ,, |  |  |
| 17 | 16-10-2014  (Thu) | Fraunhofer Diffraction at Single Slit continued… Effect of Slit Width  Maximum Number of Orders | I | ,, |  |  |
|  |  | **UNIT II – Fiber Optics** |  |  |  |  |
| 22 | 16-10-2014  (Thu) | Introduction to Fiber Optics | II | ,, |  |  |
| 23 | 17-10-2014  (Fri) | Total Internal Reflection  Principle of Optical Fiber | II | ,, |  |  |
| 24 | 21-10-2014  (Tue) | Acceptance Angle, Acceptance Cone and Numerical Aperture | II | ,, |  |  |
| 25 | 22-10-2014  (Wed) | Types of Optical Fibers and Refractive Index Profiles | II | ,, |  |  |
| 26 | 28-10-2014  (Tue) | Single Mode and Multimode Fibers and Maximum Number of Modes | II | ,, |  |  |
| 27 | 29-10-2014  (Wed) | Advantages of Optical Fiber Communication | II | ,, |  |  |
| 28 | 30-10-2014  (Thu) | Problems on Fiber Optics and Revision | II | ,, |  |  |
|  |  | **UNIT II - Lasers** |  |  |  |  |
| 29 | 30-10-2014  (Thu) | Introduction to Lasers –  Ideal Sinusoidal Wave and Practical Wave Pulses [Incoherent Pulses] | II | ,, |  |  |
| 30 | 31-10-2014  (Fri) | Characteristics of a Laser | II | ,, |  |  |
| 31 | 11-11-2014  (Tue) | Absorption, Spontaneous and Stimulated Emissions and  Einstein’s Coefficients | II | ,, |  |  |
| 32 | 12-11-2014  (Wed) | Einstein’s Coefficients continued… - MASER and LASER | II | ,, |  |  |
| 33 | 13-11-2014  (Thu) | Population Inversion in Three Level and Four Level Systems  Optical Feedback and Resonating Action | II | ,, |  |  |
| 34 | 13-11-2014  (Thu) | Ruby Laser and He-Ne Laser and Applications of Lasers | II | ,, |  |  |
| 35 | 14-11-2014  (Fri) | Problems on Lasers and Revision | II | ,, |  |  |
|  |  | **UNIT III – Crystal Structure** |  |  |  |  |
| 36 | 18-11-2014  (Tue) | Introduction to Crystal Structure and Basic Terms – Unit Cell, Primitive Cell, Lattice, Basis, Crystal Structure | III | ,, |  |  |
| 37 | 19-11-2014  (Wed) | Lattice Parameters [Crystallographic Axes, Interfacial Angles and Primitives] Atomic Radius, Coordination Number and Packing Fraction | III | ,, |  |  |
| 38 | 20-11-2014  (Thu) | Bravais Lattices | III | ,, |  |  |
| 39 | 20-11-2014  (Thu) | Illustration and Packing Fraction of Simple Cubic Structure | III | ,, |  |  |
| 40 | 21-11-2014  (Fri) | Illustration and Packing Fraction of Body Centered Cubic Structure | III | ,, |  |  |
| 41 | 25-11-2014  (Tue) | Illustration and Packing Fraction of Face Centered Cubic Structure | III | ,, |  |  |
| 42 | 26-11-2014  (Wed) | Problems on Crystal Structure and Revision | III | ,, |  |  |
|  |  | **UNIT III – X-Ray Diffraction** |  |  |  |  |
| 43 | 27-11-2014  (Thu) | Crystal Planes, Directions and Miller Indices | III | ,, |  |  |
| 44 | 27-11-2014  (Thu) | Procedure for Finding Miller Indices and  Important Features of Miller Indices | III | ,, |  |  |
| 45 | 28-11-2014  (Fri) | Inter Planar Spacing | III | ,, |  |  |
| 46 | 02-12-2014  (Tue) | Diffraction of X-Rays by Crystal Planes and Bragg’s Law | III | ,, |  |  |
| 47 | 03-12-2014  (Wed) | Problems on X-Ray Diffraction and Revision | III | ,, |  |  |
|  |  | **UNIT IV – Magnetic Properties** |  |  |  |  |
| 48 | 04-12-2014  (Thu) | Basic Terms in Magnetism – Magnetic Flux (φ),  Magntic Flux Density/Magnetic Field Induction/ Magnetic Induction (B)  Magnetic Filed Strength/Magnetizing Force/Magnetic Field Intensity/Magnetic Intensity/Intensity of Magnetizing Field (H)  Intensity of Magnetization (I), Permeability (µ) and Susceptibility | IV | ,, |  |  |
| 49 | 04-12-2014  (Thu) | Basic Terms Continued…, Relation between B, H & I | IV | ,, |  |  |
| 50 | 05-12-2014  (Fri) | Origin of Magnetic Moment – Bohr Magnetron | IV | ,, |  |  |
| 51 | 16-12-2014  (Tue) | Dia, Para and Ferromagnetism – Weiss and Domain Theory | IV | ,, |  |  |
| 52 | 17-12-2014  (Wed) | Hysteresis – Soft and Hard Magnetic Materials | IV | ,, |  |  |
| 53 | 18-12-2014  (Thu) | Problems on Magnetic Properties and Revision | IV | ,, |  |  |
|  |  | **UNIT IV – Dielectric Propeties** |  |  |  |  |
| 54 | 18-12-2014  (Thu) | Introduction to Dielectrics and Basic Terms | IV | ,, |  |  |
| 55 | 19-12-2014  (Fri) | Basic Terms Continued… | IV | ,, |  |  |
| 56 | 23-12-2014  (Tue) | Relation between D, E & P and  Relation between Permittivity and Susceptibility | IV | ,, |  |  |
| 57 | 24-12-2014  (Wed) | Electronic Polarization & Ionic Polarization | IV | ,, |  |  |
| 58 | 26-12-2014  (Fri) | Orientational Polarization | IV | ,, |  |  |
| 59 | 30-12-2014  (Tue) | Total Polarization | IV | ,, |  |  |
| 60 | 31-12-2014  (Fri) | Ferroelectricity and Piezoelectricity | IV | ,, |  |  |
| 61 | 02-01-2015  (Fri) | Problems on Dielectric Properties and Revision | IV | ,, |  |  |
|  |  | **UNIT V – Free Electron Theory** |  |  |  |  |
| 62 | 06-01-2015  (Tue) | Classical Free Electron Theory | V | ,, |  |  |
| 63 | 07-01-2015  (Wed) | Mean Free Path, Relaxation Time and Drift Velocity  Relation between various Terms | V | ,, |  |  |
| 64 | 07-01-2015  (Wed) | Problems on Free Electron Theory and Revision | V | ,, |  |  |
|  |  | **UNIT V – Preliminary Quantum Mechanics** |  |  |  |  |
| 65 | 08-01-2015  (Thu) | Origin of Quantum Theory – Black Body Radiation | V | ,, |  |  |
| 66 | 08-01-2015  (Thu) | Wein’s Law, Rayleigh Jean’s Law and Planck’s Law – Qualitative Treatment only | V | ,, |  |  |
| 67 | 08-01-2015  (Thu) | Einstein’s Mass Energy Relation, Nature of Light & Nature of Electromagnetic Radiation | V | ,, |  |  |
| 68 | 09-01-2015  (Fri) | De-Brogile’s Wave Length – Physical Significance and Properties of Matter Waves | V | ,, |  |  |
| 69 | 09-01-2015  (Fri) | Experimental Verification of De-Brogile Hypothesis – G.P. Thompson Experiment | V | ,, |  |  |
| 70 | 09-01-2015  (Fri) | Physical Significance of Wave Function – The Waves of Probability, Heisenberg’s Uncertainty Principle and its Applications | V | ,, |  |  |
| 71 | 10-01-2015  (Sat) | Schrodinger’s Time Independent Equation | V | ,, |  |  |
| 72 | 10-01-2015  (Sat) | Particle in One Dimensional Potential Box – The Relevant Plots | V | ,, |  |  |
| 73 | 10-01-2015  (Sat)) | Problems on Preliminary Quantum mechanics and Revision  Guidelines in Exam Point of View | V | ,, |  |  |