MILITARY INSTITUTE OF SCIENCE AND TECHNOLOGY

Lecture Plan for EWCE (Level-1, Term-I)

Sub: Phy-101 (Cr: 3.0)

Instructor: Lect Abdul Barik

Lec No.	Topic	Remark
	Modern Physics	
Lec-1	Theory of relativity: Frame of Reference, Postulates of special relativity, Galilean Transformation	
Lec-2	Theory of relativity: Lorentz Transformations, Length Contraction and Time dilation	
Lec-3	Velocity addition, Relativistic mass: Concept of relativistic mass and its expression	
Lec-4	Theory of relativity: Mass and Energy equivalence equation and concept of Massless particle and its expression. Related numerical problems	
	CT / Midterm /Assignment	
Lec-5	Photoelectric Effect, photocurrent and work function, kinetic energy, stopping potential	
Lec-6	Photoelectric equation, characteristics of photoelectric effect	
Lec-7	Compton effect: Definition, Compton wavelength shift, limitation	
Lec-8	De Broglie Concept, Condition for wave and particle behavior, Bohr atomic model	
Lec-9	Expression for Bohr radii and orbital energy for hydrogen atom	
	CT/ Assignment	
Lec-10	Classification of Nucleus, nuclear binding energy, mass defect, nuclear stability, fundamental forces and their contribution.	
Lec-11	Radioactivity and its transformation, Radioactive Decay Law	
Lec-12	Half- life and mean life calculation for a radioactive substance, related numerical problem.	
Lec-13	Nuclear reaction and difference between chemical reaction, concept of fusion, fission and nuclear chain reaction.	
Lec-14	Basic concepts of the working principle of a nuclear reactor, review of the whole syllabus and problem-solving session.	
Lec-15	Follow up the course	
Lec-16	Follow up the course	

Note:

Book Reference: Physics for engineers by Giasuddin Sir (Part II)

Concepts of Modern Physics by Arthur Beiser

Class Conduct

2 × classes per week (1 × class on **Optics** and 1 × class on **Modern Physics)**

CT, Midterm and Assignment

1 × CT on Optics and 2× CT on **Modern Physics**

1 × Midterm with **Optics and Waves and Oscillations**

1 × Assignment on Optics and 1 × Assignment on **Modern Physics**

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Lec No.	Topic	Remark
	Optics	
Lec-1	Introductory class: Brief discussion on total syllabus, basic requirements of the course, assessment of the course.	
Lec-2	Definitions and classifications of Lens, combination of lenses and power of lens.	
Lec-3	Defects of images, different aberration: spherical aberration, chromatic aberration, coma, astigmatism, distortion, curvature of field	
Lec-4	Theory of light: Comparison between classical wave theory and EM wave theory, Huygens's principle, superposition principle.	
Lec-5	Interference of light, young's double slit experiment	
	CT / Midterm /Assignment	
Lec-6	Interference in Thin films, Newton's ring	
Lec-7	Diffraction: Fresnel & Fraunhofer diffraction	
Lec-8	Diffraction by single slit	
Lec-9	Diffraction by double slit, Diffraction gratings	
	CT/ Assignment	
Lec-10	Polarization and Production and analysis of polarized light	
Lec-11	Optics of crystals, Nicole prism and birefringence	
Lec-12	Brewster's and Malus law	
Lec-13	Optical activity and polarimeter, optical instruments and resolving power, resolution vs magnification and Rayleigh's criterion	
Lec-14	Laser: Stimulated emission, Einstein's Coefficients for atomic transitions, population inversion and active materials, construction and working principle of laser, two three and four level laser system and application of laser.	
Lec-15	Follow up the course	
Lec-16	Follow up the course	

Note:

Book Reference: Physics for engineers by Giasuddin Sir (Part I)

Class Conduct

2 × classes per week (1 × class on **Optics** and 1 × class on **Modern Physics)**

CT, Midterm and Assignment

2 × CT on Optics and 1 × CT on **Modern Physics**

1 × Midterm with **Optics and Waves and Oscillations**

1 × Assignment on Optics and 1 × Assignment on **Modern Physics**