Meerut Institute of Engineering and Technology, Meerut			
CO-wise Syllabus- Engineering Physics			
1	CO-1	Statement	Understand the concepts of quantum mechanics.
		Syllabus	***Quantum Mechanics*** Inadequacy of classical mechanics, Planck's theory of black body radiation(qualitative), Compton effect, de-Broglie concept of matter waves, Davisson and Germer Experiment, Phase velocity and group velocity, Time-dependent and time-independent Schrodinger wave equations, Physical interpretation of wave function, Particle in a one-Dimensional box.
2	CO-2	Statement	Derive the expression for EM-wave using Maxwells equations.
		Syllabus	***Electromagnetic Field Theory*** Basic concept of Stoke's theorem and Divergence theorem, Basic laws of electricity and magnetism, Continuity equation for current density, Displacement current, Maxwell equations in integral and differential form, Maxwell equations in vacuum and in conducting medium, Poynting vector and Poynting theorem, Plane electromagnetic waves in vacuum and their transverse nature. Relation between electric and magnetic fields of an electromagnetic wave, Plane electromagnetic waves in conducting medium, Skin depth.
3	CO-3	Statement	Describe the different phenomena of light and its applications.
		Syllabus	***Wave Optics*** Coherent sources, Interference in uniform and wedge shaped thin films, Necessity of extended sources, Newton's Rings and its applications, Introduction to diffraction, Fraunhoffer diffraction at single slit and double slit, Absent spectra, Diffraction grating, Spectra with grating, Dispersive power, Resolving power, Rayleigh's criterion of resolution, Resolving power of grating.
4	CO-4	Statement	Understand the concepts and applications of fiber optics and LASER.
		Syllabus	***Fiber Optics & Laser*** ***Fibre Optics:*** Principle and construction of optical fiber, Acceptance angle, Numerical aperture, Acceptance cone, Step index and graded index fibers, Fiber optic communication principle, Attenuation, Dispersion, Application of fiber. ***Laser:*** Absorption of radiation, Spontaneous and stimulated emission of radiation, Population inversion, Einstein's Coefficients, Principles of laser action, Solid state Laser (Ruby laser) and Gas Laser (He-Ne laser), Laser applications.
5	CO-5	Statement	Understand the properties and applications of superconducting materials and nano materials.
		Syllabus	***Superconductors and Nano-Materials*** ***Superconductors:*** Temperature dependence of resistivity in superconducting materials, Meissner effect, Temperature dependence of critical field, ***Persistent current, Type I and Type II superconductors, High temperature superconductors, Properties and Applications of Super-conductors.*** ***Nano-Materials:*** Introduction and properties of nano materials, Basics concept of Quantum Dots, Quantum wires and Quantum well, Fabrication of nano materials -Top┐ Down approach (CVD) and Bottom-Up approach (Sol Gel), Properties and Application of nano materials.

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Subject Name	Engineering Physics (BAS-101/BAS-201)

Unit No.	Unit Name	Syllabus Topics	Lecture No
1	Quantum Mechanics	Inadequacy of classical mechanics, Planck's theory of black body radiation, Stefan's law, Wien's law, Rayleigh-Jeans law	1
		Compton Effect	2
		de-Broglie concept of matter waves	3
		Davisson and Germer Experiment	4
		Phase velocity and group velocity	5
		Physical interpretation of wave function, Time-dependent Schrodinger wave equations	6
		Time-independent Schrodinger wave equation, Particle in a one-dimensional box	7
		Numerical problems related to Wien's law, Stefan's law, Compton effect	8
		Numerical problems related to de-Broglie matter wave, wave function & one dimensional box	9
2	Electromagnetic Field Theory	Basic concept of Stoke's theorem and Divergence theorem, Basic laws of electricity and magnetism	10
		Continuity equation for current density, Displacement current	11
		Maxwell's Equations in differential & integral form	12
		Maxwell's equations in vacuum and conducting medium	13
		Poynting vector and Poynting theorem	14
		Plane electromagnetic wave in vacuum &transverse nature	15
		Relation between electric and magnetic field, Plane electromagnetic waves in conducting medium, Skin depth	16
		Numerical problems related to Maxwell's equation, Poynting vector, skin depth	17
3	Wave Optics	Introduction about Interference, Coherent sources, Interference in uniform thin films	18
		Wedge shaped films, Necessity of extended sources	19
		Newton's rings and its application	20
		Numerical problems related to thin film, wedge shaped film and Newton's Ring	21
		Introduction to diffraction, Fraunhoffer diffraction at single slit	22
		Fraunhoffer diffraction at double slit	23
		Diffraction grating, Absent spectra	24
		Spectra with grating, Dispersive power, Resolving power	25
		Rayleigh's criterion ofresolution, Resolving power of grating	26
		Numerical problems related Single slit, Grating, Resolving power & dispersive power	27

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Subject Name	Engineering Physics (BAS-101/BAS-201)

Unit No.	Unit Name	Syllabus Topics	Lecture No
4	Fibre Optics & Laser	Principle and construction of optical fibre, Classification of Fibre	28
		Step index and graded index fibres,V Number, Fibre optic communication principle	29
		Acceptance angle, Numerical aperture, Acceptance cone	30
		Attenuation, Dispersion,Losses, Application of fibre.	31
		Numerical problems related to acceptance angle, Numerical aperture, critical angle, V number, Attenuation	32
		Absorption of radiation, Spontaneous and stimulated emission of radiation, Principle of laser action, Pumping	33
		Metastable state, Population inversion, Einstein's Coefficients	34
		Three and four level laser, Solid state Laser(Ruby laser)	35
		Gas Laser (He-Ne laser), Laser applications & numerical	36
5	Superconductors and Nano-Materials	Superconductivity, Temperature dependence of resistivity in superconducting materials, critical magnnetic fdield,	37
		Temperature dependence of critical field, Meissner effect, Persistent current, Type I and Type II superconductors	38
		High temperature superconductors, Properties and applications of Super-conductors	39
		Numerical related to superconductor	40
		Introduction and properties of nano materials,Nano science and nano technology	41
		Basics concept of Quantum Dots, Quantum wires and Quantum well	42
		Fabrication of nano materials-Top-Down approach (CVD) and Bottom-Up approach (Sol Gel)	43
		Properties and Application of nano materials.	44