Engineering Physics for I Semester I Year B.E. / B.Tech
(With effect from 2014-15 batch)

Subject Code	Subject	L	T	P	C	Total Hours
	Applied Physics	**3**	**1**	**-**	**3**	**60**

UNIT I – PROPERTIES OF MATTER (9 Hours)

Elasticity

Stress – Strain – Hooke's law – Elastic Behavior of Material – Factors affecting elasticity – Young's modulus by cantilever depression – Non-uniform bending - Application - I-shaped girders. Torsional Pendulum – Couple per unit twist of a wire-Time period-Application- Determination of Rigidity Modulus.

UNIT II – TECHNICAL ACOUSTICS (9 Hours)

Acoustics

Acoustics of buildings – Reverberation- Weber Fechner law- Factors affecting acoustics of a building and remedies – Noise Pollution – Noise control in machines –Sabine's formula for standard reverberation time- Absorption coefficient.

Ultrasonics

Generation – Piezoelectric method – Magnetostriction method – Application of Ultrasonics in industries – NDT.

UNIT III – PHOTONICS (9 Hours)

LASER

Properties- Population inversion- Einstein's theory of stimulated emission of radiation - Different types of Lasers – Nd:YAG laser, CO_2 laser – Application of Lasers in holography.

Fiber Optics

Types of Optical Fibers (material, mode, index) – Fiber losses – acceptance angle – Numerical aperture – applications in engineering (communication).

UNIT IV – CRYSTAL PHYSICS (9 Hours)

Crystalline and amorphous solids – lattice and unit cell – seven crystal systems and Bravais lattices - crystal planes and directions- Miller indices-Expression for interplanar distance – Atomic radius, Coordination number and packing factor for simple structures: SC, BCC, FCC and HCP.

UNIT V – PHYSICS OF MATERIALS (9 Hours)

Dielectric materials

Definition – Dielectric Breakdown – Dielectric loss – Internal field – Claussius Mossotti relation.

Superconducting materials

Introduction – Meissner effect – Type I & Type II superconductors – BCS theory- Applications.

Nanomaterials

Introduction – Synthesis of nano materials – Top down and Bottom up approach- Ball milling- PVD method- Applications.

TEXT BOOKS

1. Applied Physics for Engineers – K.Venkatramanan, R.Raja, M.Sundarrajan (Scitech)
2. Applied Engineering Physics – Rajendran & Marikani (Tata McGraw Hill)
3. Modern Engineering Physics – R.K.Gaur & S.L.Gupta, Dhanpat Rai publications.
4. Modern Engineering Physics – A.S.Vasudeva – S.Chand & Company Ltd.
5. Engineering Physics – Bhattacharya, Bhaskaran – Oxford Publications.
6. Engineering Physics I & II – G.Senthilkumar, VRB publications

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REFERENCE BOOKS

1. Properties of Matter - D.S.Mathur (Unit I)
2. Sound - Brijilal & Subramanian (Unit II)
3. Engineering Physics - M.N.Avadhanulu (Unit III)
4. Fiber Optics - R.Agarwal (Unit III)
5. Solid state Physics – C.Kittal (Unit IV)
6. Modern Physics - R.Murugesan (Unit IV, V)
7. Fundamentals of Physics, 6th Edition, D. Halliday, R. Resnick and J. Walker, John Wiley and Sons, New York.

EBU12GP041 - PHYSICS PRACTICALS
[3 hrs per week]

Subject Code	Subject	L	T	P	C	Total Hours
EBU12GP041	Applied Physics Laboratory	-	-	3	2	45

Any SIX

1. Determination of Rigidity Modulus & Moment of Inertia using Torsional Pendulum.
2. Determination of Young's Modulus.
3. (a) Determination of Wavelength of Laser light using transmission grating.
   (b) Measurement of numerical aperture of an optical fiber.
4. Determination of refractive index of material of prism using i-d curve.
5. Determination of radius of curvature of the given lens using Newton's Rings.
6. Determination of Velocity of sound waves in liquid using Ultrasonic interferometer.
7. Determination of wavelength of prominent colours of mercury spectrum using Spectrometer and grating.
8. Determination of emissivity of the surface of a black body.
9. Determination of number of lines per meter of the grating using normal incidence method.
10. Basic logic gates- Verification of truth tables

REFERENCE BOOKS FOR PHYSICS PRACTICALS

1. Practical Physics - Ouseph and Rangarajan.
2. Engineering Practical Physics-K. Srinivasan.
3. Engineering Practical Physics - M.N. Avadhanulu.
4. Experimental Physics – K.Venkatramanan, R.Raja, M.Sundarrajan (Scitech)