

Course No.	Course title	L	T	P/D	Hours	Credits
CES-122	Physics for Civil Engg.	3	1	0	4	3

**Properties of Matter:** Properties of matter: Stress, Strain, Hooke's Law, Types of moduli of elasticity, Torsional pendulum, Determination of Rigidity modulus of a wire, bending of beams, expression for bending moment, Measurement of Young's modulus by uniform and Non-uniform bending.

**Hydrodynamics:** Continuity and Euler equations, Navier-Stokes equation for viscous fluids, Stokes solution in various geometries, drag, stream lines, Stream line flow, Turbulent flow, Poiseuille's formula for flow of liquid through a capillary tube, Determination of coefficient of viscosity of a liquid.

**Acoustics:** Acoustics: Classification of sound, Simple harmonic motion, vibrations, Characteristics of musical sound, Loudness, Weber-Fechner law, Decibel, Reverberation time, Sabine's formula, Acoustics of buildings, Factors affecting acoustics of building (Optimum reverberation time, Loudness, Focusing, Echo, Resonance and Noise, and their remedies), Measurement of sound absorption coefficient, Sound absorbing materials.

**Ultrasonics:** Ultrasonics waves, Ultrasonic wave production, Properties of ultrasonic waves, Determination of velocity using acoustic grating Applications of Ultrasonic waves, Magnetostriction method, Piezoelectric method, SONAR, Acoustics of grating.

**Mechanics and Theory of Relativity:** Displacement, velocity and acceleration in polar and spherical coordinate systems, inertial and non inertial frames, Michelson and Morley experiment, postulates of special theory of relativity, Lorentz's space- time transformations and their consequences, velocity transformations, mass variation with velocity, mass energy equivalence, momentum and energy transformations.

**Laser:** Laser: Basic Principle, Einstein theory, Characteristics of laser, Nd: YAG laser, CO<sub>2</sub> laser, Semiconductor laser (homo junction), Determination of wave length of laser using grating, Particle size, Application:

#### Books

1. Avadhanulu M.N. and Kshirsagar P.G., "A Text Book of Engineering Physics", S.Chand & Company Ltd., 7th Enlarged Revised Ed., 2005
2. Gaur R.K. and Gupta S.L., "Engineering Physics", Dhanpat Rai Publishers, New Delhi, 2001
3. Arumugam M., "Engineering Physics", Anuradha Agencies, Kumbakonam, 2nd Edition, 2005
4. Pillai S.O., "Solid State Physics", New Age International Publications, New Delhi, 6th Edition, 2005
5. Palanisamy P.K., "Physics for Engineers", Scitech Publications (India) Pvt. Ltd., Chennai, 2<sup>nd</sup> Ed., 2005
6. Chitra Shadrach and Sivakumar Vadivelu, "Engineering Physics", Pearson Edu., 1<sup>st</sup> Ed. New Delhi, 2007.