

APPLIED PHYSICS

I Semester: AE / ME/CE

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P		C	CIA	SEE
AHS007	Foundation	3	1	-	4	30	70	100
		Practical Classes: -			Total Classes: 60			

OBJECTIVES:

The course should enable the students to:

- I.** Develop the strong fundamentals of system of forces and friction.
- II.** Strengthen the knowledge of theoretical and technological aspects of dynamics of rigid bodies.
- III.** Correlate principles with applications of the dielectric and magnetic materials.
- IV.** Enrich knowledge in acoustics and ultrasonics

COURSE LEARNING OUTCOMES (CLOs):

1. Recall the basic principles of physics.
2. Apply the concepts and principles in solving the problems of physics.
3. Acquire knowledge of basic terms related to dielectric materials and different polarization mechanisms.
4. Review properties of different magnetic materials and magnetization based on orientation of domains.
5. Recollect basic principles of acoustics of buildings and modern architectural acoustic techniques.
6. Explain production, properties and applications of ultrasonic waves
7. Review the basic concepts of system of forces
8. Analyze different law of forces and condition of equilibrium.
9. Discuss different types and laws of friction.
10. Interpret applications of friction.
11. Describe rotational motion of rigid bodies and moment of inertia of some of the regular shapes.
12. Identify and apply theorems of moment of inertia.
13. Correlate different concept of physics with day to day life applications.
14. Understand the technical importance of moment of inertia of regular and irregular bodies.
15. Identify the modern engineering devices based on basic principles of forces and friction.

Unit-I	DIELECTRIC AND MAGNETIC PROPERTIES	Classes: 09
Dielectric Properties: Basic definitions, electronic, ionic and orientation polarizations-qualitative; Internal field in solids. Magnetic Properties: Basic definitions, origin of magnetic moment, Bohr magneton, classification of dia, para and ferro magnetic materials on the basis of magnetic moment, domain theory of ferro magnetism on the basis of hysteresis curve.		
Unit-II	ACOUSTICS AND ULTRASONICS	Classes: 09
Acoustics: Reverberation, reverberation time, Sabine's formula (qualitative), absorption coefficient, measurement of absorption coefficient, factors affecting acoustics of an auditorium and their remedies; Ultrasonics: Introduction; Generation of ultrasonic waves; Magnetostriction method, piezoelectric method, properties, applications.		
Unit-III	EQUILIBRIUM OF SYSTEM OF FORCES	Classes: 09
Introduction, basic concepts, system of forces, coplanar concurrent forces, force systems in plane, parallel forces in plane; Force systems in space. Couples, resultant, Lami's theorem, triangle law of forces, polygon law of forces, condition of equilibrium.		
Unit-IV	FRICITION	Classes: 09
Friction: Types of friction, limiting friction, laws of friction, angle of repose, equilibrium of body laying on rough inclined plane, Application of friction: ladder friction, wedge friction, screw friction.		
Unit-V	DYNAMICS OF RIGID BODIES - MOMENT OF INERTIA	Classes: 09
Rotational motion, torque, angular momentum, relation between torque and angular momentum, angular momentum of system of particles, moment of inertia, expression for moment of inertia, radius of gyration, theorems on moment of inertia, moment of inertia of thin rod, rectangular lamina, circular disc.		
Text Books:		
1. Dr. K. Vijaya Kumar, Dr. S. Chandralingam, "Modern Engineering Physics", Chand & Co. New Delhi, 1 st Edition, 2010. 2. R. C Hibbler, "Engineering mechanics", Prentice Hall, 12th Edition, 2009.		
Reference Books:		
1. R. K. Gaur, S. L. Gupta, "Engineering Physics", Dhanpat Rai Publications, 8 th Edition, 2001. 2. Timoshenko, D. H. Young, "Engineering mechanics", Tata Mc Graw Hill, 5th Edition, 2013. 3. Hitendra K Malik, A. K. Singh, "Engineering Physics", Mc Graw Hill Education, 1 st Edition, 2009. 4. S. S. Bhavikatti, "A text book of Engineering mechanics", New age international, 1st Edition, 2012.		
Web References:		
1. http://link.springer.com/book 2. http://www.thphys.physics.ox.ac.uk 3. http://www.sciencedirect.com/science 4. http://www.e-booksdirectory.com		
E-Text Books:		
1. http://www.peaceone.net/basic/Feynman/ 2. http://physicsdatabase.com/free-physics-books/ 3. http://www.damtp.cam.ac.uk/user/tong/statphys/sp.pdf 4. http://www.freebookcentre.net/Physics/Solid-State-Physics-Books.html		