APPLIED PHYSICS

I Semester: AE / CE / ME								

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

Contact Classes:45	Tutorial Classes:15	Practical Classes: Nil	Total Classes: 60

I. COURSE OVERVIEW:

This course develops abstract and critical reasoning by studying mathematical and logical proofs and assumptions as applied in basic physics and to make connections between physics and other branches of sciences and technology. The topics covered include dielectric and magnetic properties, acoustics of buildings, ultrasonics, equilibrium of system of forces, friction and dynamics of rigid bodies. The course helps students to gain knowledge of basic principles and appreciate the diverse applications in technological fields in respective branches and also in their lives.

II. 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 the principles with applications of the dielectric and magnetic materials.

IV. Enrich the knowledge in acoustics and ultrasonics.

III. COURSE OUTCOMES:

After successful completion of the course, students should be able to:

CO 1	**Illustrate** the properties of dielectric and magnetic materials which are suitable for engineering applications.	Understand
CO 2	**Outline** the basic principles of acoustics of buildings and modern architectural acoustic techniques using Sabine's formula.	Understand
CO 3	**Demonstrate** the generation and applications of ultrasonic waves indifferent fields of science and industries.	Understand
CO 4	**Identify** the condition of equilibrium from basic concepts and the laws offorces.	Apply
CO 5	**Make use of** laws of friction to obtain equilibrium of a body lying on aninclined plane.	Apply
CO 6	**Apply** knowledge of parallel and perpendicular theorems to obtain Moment of inertia of different types of objects.	Apply

IV. SYLLABUS:

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, forces systems in plane, parallel forces in plane.

Force systems in space, couples, resultant, Lami's theorem, triangle law of forces, polygon law of forces, and condition of equilibrium.

UNIT-IV	FRICTION	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", S.Chand & Co, New Delhi, 1st 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, 8th Edition, 2001.
2. Timoshenko, D. H. Young, "Engineering mechanics", Tata McGraw Hill, 5th Edition, 2013.
3. Hitendra K Malik, A. K. Singh, "Engineering Physics", McGraw Hill Education, 1st 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
2. http://www.intechopen.com
3. http://www.iitg.ernet.in/rkbc/me101/Presentation/L01-03.pdf
4. http://www.vssut.ac.in/lecture_notes/lecture1423904717.pdf

E-Text Books:

1. http://www.peaceone.net/basic/Feynman/
2. http://physicsdatabase.com/free-physics-books/
3. http://www.freeengineeringbooks.com/Civil/Engineering-Mechancs-Books.php
4. http://www.textbooksonline.tn.nic.in/books/11/stdxi-voc-ema-em-2.pdf

Course Home Page: