DKM COLLEGE FOR WOMEN
DEPARTMENT OF PHYSICS
Allied Physics I

Semester	Subject Code	Category	Lecture	Theory		Practical	Credit
				Hr/week	Hr/Semester		
I		Allied	60 Hrs	4	60	NIL	4

COURSE OBJECTIVES:

- Apply Physics principles and mathematical methods of various fields of Physics.

- To explain various Physical, Electrical and Optical properties of materials.

- To obtain the intellectual ability to translate, interpret and extrapolate the most important scientific models and laws governing the motion of objects.

COURSE OUTCOMES:

On the successful completion of this course students will be able

CO Number	CO Statement	Knowledge Level(K1-K4)
CO1	To get the basic knowledge about materials which they use their day today life and its practical applications.	K2
CO2	To analysis basics of optics and apply them to intuitive capability to research on things involved in light and	K4
CO3	To design and trouble shoot basic electrical circuits and to classify the magnetic materials	K3
CO4	To extend the application oriented knowledge of Ultrasonic waves and its role in building construction.	K2
CO5	To construct, simple electronic components and to apply them in their day-today life.	K3

Knowledge level:K1-Remember,K2-Understanding Level,K3-Apply,K4 –Analysis.

MAPPING WITH PROGRAMME OUTCOMES

Cos	PO1	PO2	PO3	PO4	PO5
CO1	M	M	S	S	S
CO2	S	S	S	M	M
CO3	S	M	S	S	M
CO4	S	S	S	S	S
CO5	S	S	S	S	S

S- Strong   M – Medium   L – Low

ALLIED PHYSICS I

UNIT-I: PROPERTIES OF MATTER   (12 Hrs)

Elasticity: Hooke's Law-Elastic Constants- Relation between three moduli of elasticity- Stress and strain diagram- Poisson's ratio- Bending of Beam-Bending Moment-Cantilever-Depression at the Loaded End of the Cantilever- Determination of Young's Modulus by Non-Uniform Bending- I shape Girder-Principle and Working of Atomic force microscopy.

Torsion: Torsion couple- Potential Energy in a Twisted Wire- Torsional Pendulum -Rigidity Modulus-Determination of Rigidity Modulus by Torsional Oscillation (Without Masses)- Applications of Torsion Springs- in Clocks-Cloths Pin- automotive-Medical Equipments & Door Hinges.

Viscosity: Viscosity of Liquids-Viscous Force-Stokes' law-Co-Efficient Of Viscosity of a Liquid- Poiseuille's formula (No Derivation)-Determination of Co-Efficient of Viscosity (Graduated Burette method) -Comparison of Viscosities of Two Liquids by Graduated Burette Method- Applications of Viscosity in day today life (any five).

UNIT- II: OPTICS   (12 Hrs)

Defects of Images (Lens): Spherical aberration- Methods to minimize spherical aberration-minimizing spherical aberration with two lenses out of contact- Rainbow- Primary Rainbow.

Physical Optics: Coherent sources -Interference- Determination of diameter of a thin wire by air wedge- Test for optical flatness- Interference in Mechanical & Radio waves –Holograms-applications of holography.

Polarisation: Optical activity- specific rotatory power of an optically active substance-Determination of specific rotatory power of a solution using Laurent half-shade polarimeter-uses of polarized light. Applications of Polarized Light: LCD.

UNIT-III: ELECTRICITY AND MAGNETISM   (12 Hrs)

Electricity-Transient current-Growth and decay of charge containing Resistance and Capacitor in a circuit (RC-Series Circuit) -Growth and decay of current in a circuit containingInductance and resistance (LR series circuit) - smart screen-touch screen -voltage type- current type.

Introduction to magnetism- magnetic Induction (B)-magnetisation (M)-magnetic intensity (H)-relation between B & M- Different types of magnetic materials (dia- , para- , ferro – and antiferro)- hysteresis loop.

UNIT-IV: SOUND AND ACCOUSTICS OF BUILDING (12Hrs)

Sound: Transverse vibration of strings- Velocity and frequency of vibrations of a stretched string- laws of vibrations along a stretched string- Sonometer-A.C.Frequency- Steel wire- Brass wire.

Ultrasonic's: Introduction to Ultrasonics **-**Production of Sound waves by Piezo-electric method-Properties and uses-applications of ultrasonics: SONAR and NDT.

Acoustics of buildings: Reverberation- Reverberation time- conditions for the perfect acoustics.

UNIT-V: DIGITAL ELECTRONICS (12 Hrs)

Junction diode-Construction and working of AND, OR, NOT, NAND and NOR gates using diodes-Demorgan's theorem-Zener diode characteristics-Zener diode as voltage regulator-Rectifier-full wave bridge rectifier.

Integrated Circuits- SSI- MSI- LSI- VLSI- Advantages of IC's- Limitations of IC's-Fabrication of diode and transistor by monolithic technology.

TEACHING METHODOLOGY:

- Class Room Teaching
- Assignments
- Discussions
- Home Test
- PPT Presentations
- Mini Projects
- Demo using Models

TEXT BOOKS

S.NO	AUTHORS	TITLE	PUBLISHERS	YEAR OF PUBLICATION
1.	R. Murugesan	Allied Physics	Chand & Co. First Edition	2005
2.	Prof. Dr.G.Ravichandran,	Allied Physics Part-I	Ppadmapriya Publications, Puducherry First Edition	2007
3.	D.S.Mathur	Element of Properties of matter	S.Chand& Co.	1999
4.	Prof. Subramaniam	Optics	S.Chand& Co.	2007

S.NO		TITLE	PUBLISHERS	YEAR
5.	R. Murugesan,	Modern physics	S.Chand& Co.	2004
6.	Hugh D. Young and Roger A. Freedman,	Sears &Zemansky's University Physics with Modern Physics	Pearson publications, 14th Edition	2015

REFERENCE BOOKS

S.NO	AUTHORS	TITLE	PUBLISHERS	YEAR OF PUBLICATION
1.	Venugopal	Digital Circuits and systems	Tata McGraw Hill	2011
2.	S. Salivahanan& N. S.Kumar,	Electronic Devices and circuits	Tata McGraw Hill	2012
3.	U.Tietze,	Handbook of design and applications	Ch. Schenk,	2008
4.	Integrated Electronics: Analog and Digital circuits and Systems	Jacob Millmann and Christos C Halkias	McGraw Hill,	2013

WEB SOURCE:

1. http://www.scienceclarified.com/everyday/Real-Life-Chemistry-Vol-3-Physics-Vol-1/Fluid-Mechanics-Real-life-applications.html

2. http://www.circuitstoday.com/monolithic-ic

3. https://www.elprocus.com/ever-wondered-lcd-works/