

COURSE	ALLIED PAPER
COURSE TITLE	ALLIED PHYSICS – I
CREDITS	3
COURSE OBJECTIVES	To impart basic principles of Physics that which would be helpful for students who have taken programmes other than Physics.

UNITS	COURSE DETAILS
UNIT-I	WAVES, OSCILLATIONS AND ULTRASONICS: Definition of simple harmonic motion (SHM) – laws of transverse vibrations of strings – determination of AC frequency using sonometer (steel and brass wires) – ultrasound – production – piezoelectric method – application of ultrasonics: medical field – lithotripsy, ultrasonography.
UNIT-II	PROPERTIES OF MATTER: <i>Elasticity:</i> elastic constants – bending of beam – theory of non- uniform bending – determination of Young’s modulus by non-uniform bending – energy stored in a stretched wire – torsion of a wire – determination of rigidity modulus by torsional pendulum <i>Viscosity:</i> streamline and turbulent motion – critical velocity – coefficient of viscosity – Poiseuille’s formula – comparison of viscosities – burette method, <i>Surface tension:</i> definition– drop weight method – interfacial surface tension.
UNIT-III	HEAT AND THERMODYNAMICS: Joule-Kelvin effect – Joule-Thomson porous plug experiment – theory – temperature of inversion – liquefaction of Oxygen– Linde’s process of liquefaction of air– liquid Oxygen for medical purpose– importance of cryocoolers– entropy – change of entropy in reversible and irreversible process.
UNIT-IV	ELECTRICITY AND MAGNETISM: potentiometer – principle – measurement of thermo emf using potentiometer –magnetic field due to a current carrying conductor – Biot-Savart’s law – field along the axis of the coil carrying current – peak, average and RMS values of ac current and voltage .
UNIT-V	DIGITAL ELECTRONICS AND DIGITAL INDIA: logic gates, OR, AND, NOT, NAND, NOR , EXOR logic gates – universal building blocks – Boolean algebra – De Morgan’s theorem – verification – overview of Government initiatives: software technological parks under MeitY, NIELIT- semiconductor laboratories under Dept. of Space – an introduction to Digital India.
PROFESSIONAL COMPONENTS	Expert lectures –seminars — webinars – industry inputs – social accountability – patriotism
TEXT BOOKS	<ol style="list-style-type: none"> 1. R.Murugesan (2001), AlliedPhysics,S. ChandandCo,NewDelhi. 2. BrijlalandN.Subramanyam (1994), WavesandOscillations,VikasPublishing House,NewDelhi. 3. BrijlalandN.Subramaniam (1994), PropertiesofMatter,S.ChandandCo.,NewDelhi. 4. J.B.Rajam and C.L.Arora (1976). Heat and Thermodynamics

	<p>(8th edition), S.ChandandCo.,New Delhi.</p> <p>5. R.Murugesan(2005), OpticsandSpectroscopy,S.ChandandCo,NewDelhi.</p> <p>6. A.Subramaniyam, AppliedElectronics2ndEdn.,NationalPublishingCo.,Chennai.</p>
REFERENCE BOOKS	<p>1. ResnickHallidayandWalker(2018).FundamentalsofPhysics(11the dition),JohnWilleyand Sons, Asia Pvt.Ltd., Singapore.</p> <p>2. V.R.KhannaandR.S.Bedi (1998), TextbookofSound1stEdn. KedharnaathPublishandCo, Meerut.</p> <p>3. N.S.KhareandS.S.Srivastava (1983), ElectricityandMagnetism10thEdn.,AtmaRamandSons, New Delhi.</p> <p>4. D.R.KhannaandH.R. Gulati(1979). Optics,S. Chand andCo.Ltd.,New Delhi.</p> <p>5. V.K.Metha(2004).Principlesofelectronics6thEdn. S.Chandandcompany.</p>
WEB RESOURCES	<p>1. https://youtu.be/M_5KYncYNyc</p> <p>2. https://youtu.be/ljJLJgIvaHY</p> <p>3. https://youtu.be/7mGqd9HQ_AU</p> <p>4. https://youtu.be/h5jOAw57OXM</p> <p>5. https://learningtechnologyofficial.com/category/fluid-mechanics-lab/</p> <p>6. http://hyperphysics.phy-astr.gsu.edu/hbase/permot2.htmlhttps://www.youtube.com/watch?v=gT8Nth9NWPMhttps://www.youtube.com/watch?v=9mXOMzUruMQ&dt=1shttps://www.youtube.com/watch?v=m4u-SuaSu1sandt=3shttps://www.biolinscientific.com/blog/what-are-surfactants-and-how-do-they-work</p>

COURSE	ODD SEMESTER - CORE
COURSE TITLE	ALLIED PRACTICAL- I
CREDITS	3
COURSE OBJECTIVES	Apply various physics concepts to understand Properties of Matter and waves, set up experimentation to verify theories, quantify and analyse, able to do error analysis and correlate results
<p>Minimum of Eight Experiments from the list:</p> <ol style="list-style-type: none"> 1. Young's modulus by non-uniform bending using pin and microscope 2. Young's modulus by non-uniform bending using optic lever, scale and telescope 3. Rigidity modulus by static torsion method. 4. Rigidity modulus by torsional oscillations without mass 2. Surface tension and interfacial Surface tension – drop weight method 3. Comparison of viscosities of two liquids – burette method 4. Specific heat capacity of a liquid – half time correction 5. Verification of laws of transverse vibrations using sonometer 6. Calibration of low range voltmeter using potentiometer 7. Determination of thermo emf using potentiometer 8. Verification of truth tables of basic logic gates using ICs 9. Verification of De Morgan's theorems using logic gate ICs. 10. Use of NAND as universal building block (AND, OR, NOT). <p><i>Note : Use of digital balance permitted</i></p>	