

Course Code 22BPHA1	Allied-IA		T/P	C	H/W
	GENERAL PHYSICS - I		T	3	3
Objectives	➤ To introduce the concepts of bending of beams, viscosity of liquids, Process of heat flow from one point to other, Laws of thermodynamics and basic properties of light to the allied students				
Unit - I	Properties Of Matter:- Young's modulus – Rigidity modulus – Bulk modulus – Poisson's ratio (definition alone) – Bending of beams – Expression for bending moment – determination of young's modulus – uniform and non-uniform bending. Expression for Couple per unit twist – work done in twisting a wire – Torsional oscillations of a body– Rigidity modulus of a wire and M.I. of a disc by torsion pendulum.				
Unit - II	Viscosity:- Viscosity – Viscous force – Co-efficient of viscosity – units and dimensions – Poiseuilles formula for co-efficient of viscosity of a liquid – determination of co-efficient of viscosity using burette and comparison of Viscosities - Bernoulli's theorem – Statement and proof – Venturimeter.				
Unit - III	Conduction, Convection And Radiation:- Specific heat capacity – Specific heat capacity of a liquid by cooling – Newton's law of cooling – Thermal conduction –coefficient of thermal conductivity - Lee's disc method. Convection process – Lapse rate – green house effect –Radiation - Black body radiation – Planck's radiation law – Rayleigh Jean's law, Wien's displacement law – Stefan's law of radiation. (No derivations)				
Unit - IV	Thermodynamics:- Zeroth and I Law of thermodynamics – II law of thermodynamics – Carnot's engine and Carnot's cycle – Efficiency of a Carnot's Cycle – Entropy – Change in entropy in reversible and irreversible process – change in entropy of a perfect gas – change in entropy when ice is converted into steam.				
Unit - V	Optics:- Interference – Newton's rings – determination of wavelength using Newton's rings. Diffraction – Difference between diffraction and interference – Theory of transmission grating – optical activity – Biot's laws – Specific rotatory power – determination of specific rotatory power using Laurent's half shade polarimeter.				
Reference and Text Books :- Brijlal and Subramaniam S. (2006). <i>Properties of matter</i> . New Delhi: S. Chand & Company. Brijlal and Subramanyam S. (2005). <i>Heat and Thermodynamics</i> . New Delhi: 16th Edition S.Chand & Co, Mathur D.S. (2004). <i>Elements of properties of matter</i> . New Delhi: S. Chand & Company. Mathur D.S. (2014). <i>Heat and Thermodynamics</i> . New Delhi: 5th Edition S. Chand & Company. Murugesan R. (2004). <i>Properties of matter</i> . New Delhi: S. Chand & Company. Murugesan R. (2008). <i>Optics and Spectroscopy</i> . New Delhi: S. Chand & Company. Subramanyam and Brijlal. (2004). <i>A text book of Optics</i> . New Delhi: S. Chand & Company.					
Outcomes	➤ The students will be able to understand the concepts of bending of beams, the viscosity of liquids, Process of heat flow from one point to another, Laws of thermodynamics and basic properties of light				

Course Code 22BPHAP1	Allied-IA		T/P	C	H/W
	GENERAL PHYSICS PRACTICAL - I		P	2	2
Objectives	<ul style="list-style-type: none"> ➤ To determine the modulus of elasticity and rigidity modulus by various methods ➤ To find the resonance frequency of series resonance circuit ➤ To determine the wavelength of most prominent colours of mercury spectrum ➤ To find the thickness of a thin wire 				
	<p>Any Seven Experiments:-</p> <ol style="list-style-type: none"> 1. Young's modulus – Uniform bending (Pin and Microscope) 2. Young's modulus – Non Uniform bending (Optic lever) 3. Torsion Pendulum – Rigidity modulus of a wire and M.I. of the disc 4. Comparison of viscosities of liquids using a burette. 5. Calibration of Voltmeter – Potentiometer 6. LCR – series resonance circuit 7. Newton's law of cooling - verification of law 8. Coefficient of thermal conductivity – Lee's disc method 9. Thickness of a thin wire by air wedge 10. Grating – Normal incidence method 11. Calibration of Ammeter – Potentiometer 12. Logic gates using IC 				
Outcomes	<ul style="list-style-type: none"> ➤ The students will be able to determine the modulus of elasticity and rigidity modulus by various methods and find the resonance frequency of the series resonance circuit. He will also be able to determine the wavelength of the most prominent colours of the mercury spectrum and the thickness of a thin wire 				

Course Code 22BPHA2	Allied – I B		T/P	C	H/W
	GENERAL PHYSICS – II		T	3	3
Objectives	<ul style="list-style-type: none"> ➤ To introduce the concepts of electricity, measurement of resistances, series and parallel resonance circuits, the structure of the atom, nuclear fission and fusion processes ➤ To introduce the working principle of transistors, number systems and uses of logic gates for arithmetic operations to the allied students 				
Unit - I	Current Electricity:- Kirchoff's laws – Wheatstone's network – condition for balance - Carey-Foster's bridge – Measurement of specific resistance – temperature coefficient of resistance – Potentiometer – Calibration of Voltmeter.				
Unit - II	Electromagnetism :- Electromagnetic Induction – Faraday's laws – Lenz law – Self Inductance – Mutual Inductance – Coefficient of Coupling. A.C. Circuits – Mean value – RMS value – Peak value – LCR in series resonance circuit - LCR Parallel resonance circuit – Sharpness of resonance.				
Unit - III	Atomic And Nuclear Physics:- Bohr's atom model – radius energy – Atomic excitation – Ionization potential – Frank and Hertz Method – Nucleus – Nuclear properties – Mass defect – Binding energy. Nuclear fusion and Nuclear fission – Atomic bomb– X-rays – Bragg's law – properties and uses of industrial and medical fields.				
Unit - IV	Analog Electronics :- Semiconductor – PN junction diode – Bridge rectifier – Zener diode – Regulated power supply. Transistor – Working of a transistor – CE Configuration – Current gain relationship between α and β – Transistor Characteristics (CE Configuration only) – CE amplifier – feedback – Hartley oscillator .				
Unit - V	Digital Electronics :- Number system – Decimal – Binary – Octal and Hexadecimal system – Double Dabble method – Binary addition, subtraction, multiplication and division – conversion of one number system to another number system. Logic gates – OR, AND, NOT, XOR, NAND and NOR gates – truth tables – Half adder, and Full adder – Laws and theorems of Boolean's algebra – De Morgan's theorems.				
Books for Study and Reference :- Murugeshan R. (2008). <i>Electricity and Magnetism</i> . New Delhi: S Chand & Company. Murugeshan R. KiruthigaSivaprasath. (2008). <i>Modern Physics</i> . New Delhi: S. Chand & Company. Theraja B.L. (2003). <i>Basic Electronics</i> . New Delhi: S Chand & Company.					
Outcomes	<ul style="list-style-type: none"> ➤ The students will be able to understand the concepts of electricity, measurement of resistances, series and parallel resonance circuits, the structure of the atom and nuclear fission and fusion processes ➤ The students will also be able to understand the working principle of transistors, number systems and uses of logic gates for arithmetic operations 				

Course Code 22BPHAP2	Allied-I B		T/P	C	H/W
	GENERAL PHYSICS PRACTICAL-II		P	2	2
Objectives	<ul style="list-style-type: none"> ➤ To determine the modulus of elasticity by various methods and instruments. ➤ To determine the radius of curvature of a thin lens ➤ To find the resonance frequency of series and parallel circuits ➤ To know the working principle of logic gates 				
	<p>Any Seven Experiments:-</p> <ol style="list-style-type: none"> 1. Young's modulus – Uniform bending (Optic lever) 2. Young's modulus – Non uniform bending (Pin and Microscope) 3. Carey – Foster Bridge – temperature co-efficient of resistance 4. LCR – parallel resonance circuit 5. Zener diode as a voltage regulator 6. Transistor Characteristics – CE 7. Newton's rings – Radius of curvature of a lens 8. Bridge rectifier 9. Comparison of resistances - Potentiometer 10. Logic circuits using discrete components 11. NAND & NOR as universal gates 				
Outcomes	<ul style="list-style-type: none"> ➤ The students will be able to determine the modulus of elasticity by various methods, determine the radius of curvature of a thin lens, find the resonance frequency of series and parallel circuits and know the working principle of logic gates 				

Course Code 22BPHA3		Allied-II A	T/P	C	H/W
		GENERAL PHYSICS - III	T	3	3
Objectives	➤ To introduce the concepts of direct and alternating current, semiconducting devices, rectification process, working of transistor and other special devices and working of various measuring devices to the allied students				
Unit - I	DC And AC Fundamentals :- Direct – voltages and current - Kirchoffs laws - alternating voltages and current – RMS value of voltage and current – Power, frequency, time period, phase difference, average value, peak to peak value of ac. Passive circuit elements: Resistors, inductors, and capacitors – types and colour codes – AF and RF chokes.				
Unit - II	Semiconductors :- Diodes: PN junction diode characteristics – Half wave, full wave and bridge rectifiers – Different diodes – Zener, Varactor, light emitting diode, photo diode, tunnel diode. Transistors: Transistor – working – characteristics of a transistor – CB, CE, and CC configuration– Load line – quiescent point – JFET static characteristics – pinch-off voltage.				
Unit - III	Power Electronics :- Principle, construction, operation and characteristics of SCR, UJT, DIAC and TRIAC. Application of SCR as controlled rectifier – UJT relaxation oscillator – DIAC and TRIAC controller circuits.				
Unit - IV	Measuring Instruments :- Galvanometer – conversion into ammeter and voltmeter – Multimeter – construction and operation– block diagram of CRO– basic operation – voltage and phase measurement – Display and analysis. Recorders and Bio Medical Recorders: X-Y recorder – Magnetic tape recorder – characteristics of recording system – Electro-cardiography (ECG) – Electro-encephalography (EEG) – Electro-myography (EMG) – Electro-retinography (ERG).				
Unit - V	Home Appliances :- Electric fans – principle and working – Refrigerators – principle and operation – Tape recorder– principle and working. Air conditioner and Air Coolers – principle and working – Washing machines – general principle and working.				
Reference and Text Books :- Arumugam M. (2008). <i>Bio-medical Instrumentation</i> . Kumbakonam: Anuradha Publication, Mehta V.K. Rohit Mehta. (2005). <i>Principles of Electronics</i> . New Delhi: S Chand & Company. Salivahanan S. Sureshkumar Vallavaraj A. (2010). <i>Electronic Devices and Circuits</i> . New Delhi:Tata Mcgraw Hill Publishing Company. Theraja B.L. (2003). <i>Basic Electronics</i> . New Delhi: S Chand & Company. William D. Cooper. (2010). <i>Electronic instruments and measurement techniques</i> . New Delhi: PHI Private Company.					
Outcomes	➤ The students will be able to understand the concepts of direct and alternating current, semiconducting devices, rectification process, working of transistor and other special devices and working of various household devices				

Course Code 22BPHAP3	Allied-II A	T/P	C	H/W
	GENERAL PHYSICS PRACTICAL-III	P	2	2
Objectives	<ul style="list-style-type: none"> ➤ To understand the working principle of special electronic devices ➤ To construct adding circuit and rectification circuit ➤ To know the process of addition, subtraction, multiplication and division using electronic gates 			
	<p>Any Seven Experiments:-</p> <ol style="list-style-type: none"> 1. Measurement of R, C and L using multimeters 2. Measurement of R, C and L using VTVM 3. Half & Full wave rectifier – construction of measurement 4. Study of logic gates using ICs (AND, OR, NOT, NAND, NOR, EX-OR etc) 5. UJT characteristics 6. SCR characteristics 7. Transistor amplifier. 8. Thermistor characteristics 9. 7 segment display characteristics 10. Full Adder – Binary Addition 			
Outcomes	<ul style="list-style-type: none"> ➤ The students will be able to understand the working principle of special electronic devices, construct adding circuit and rectification circuit and also know the process of addition, subtraction, multiplication and division using electronic gates 			

Course Code 22BPHA4	Allied-II B		T/P	C	H/W
	GENERAL PHYSICS – IV		T	3	3
Objectives	➤ To introduce integrated circuits, fabrication of various semi conducting devices, characteristics of operational amplifier, transducers, working of television and radar to the allied students				
Unit - I	Integrated Circuits :- Classification – IC Chip size and circuit complexity – Fundamentals of Monolithic IC technology – Fabrication of Diode, Transistor, FET, Resistor, Inductor and Capacitor – IC Package and symbols. Analog ICs: op-amp characteristics and simple applications. Digital IC's – basic logic gates – truth table				
Unit - II	Transducers :- Photo voltaic cells – photo conductive cells – photo emissive cells – loud speakers – electro dynamic and electrostatic types – carbon, dynamic and crystal microphones – applications. Thermostat – temperature control – liquid level indicators – measurement of pressure using resistance Strain Gauges – Transducers – inductive capacitive and resistive types				
Unit - III	Semiconductor Memories :- Introduction – ROM using diodes and transistors – ROM in terms of digital circuits – Building memory of larger capacity – PROM – EPROM – EEPROM – ROM as a unit in microcomputers – RAM – Static RAM – Dynamic RAM – Memory Parameters.				
Unit - IV	Opto-Electronic Devices :- LED radiation transition - Emission spectra –Luminescent efficiency-Method of Excitation-Visible LED-Materials for LED - LED configuration -Photo conduction – Photo diode-Photo transistor-electronic watches-seven segment display -LCD.				
Unit - V	Radar :- Principle of Radar – basic arrangement of radar system – operating characteristics of radar systems– maximum range of a radar set – radar transmitting systems – radar antennas – duplexer – radar receivers – indicator unit – description of radar systems				
Reference and Text Books :- Grob B. (1989). <i>Basic Electronics</i> . New Delhi: 6th Edition Tata Mcgraw Hill Publishing Company. Gupta and Kumar. (2002). <i>Hand Book of Electronics</i> . Meerut : PragatiPrakashan. Jacob Millman & C. C. Halkias (2006). <i>Integrated Electronics</i> . New Delhi:Tata Mcgraw Hill Publishing Company.. Kennedy. (2009). <i>Electronic Communication Systems</i> . New Delhi:Tata Mcgraw Hill Publishing Company. Theraja, B L, <i>Electronics Devices & Circuits</i> , Delhi: S. Chand & Co, 2011 Mittal.G.K. (1993). <i>Electronic Devices</i> . G.K. Publishers Pvt. Ltd. Sam K. Shanmugam. (2007). <i>Digital and Analog Communication System</i> . Canada: John Willey & sons.					
Outcomes	➤ The students will be able to understand the fabrication of integrated circuits and various semi conductors memories, transducers, working of Opto electronic devices and radar				

Course Code 22BPHAP4	Allied-II B	T/P	C	H/W
	GENERAL PHYSICS PRACTICAL - IV	P	2	2
Objectives	<ul style="list-style-type: none"> ➤ To understand the working principle of special devices ➤ To have an knowledge of filters and regulators ➤ To write simple programs in microprocessor ➤ To construct regulated power supplies, PCB and know the process of modulation 			
	<p>Any Seven Experiments:-</p> <ol style="list-style-type: none"> 1. UJT relaxation oscillator 2. Measurement of voltage, current, frequency and phase using CRO 3. Photo diode characteristics 4. FET characteristics 5. Dual Power supply 6. OPAMP circuits – low pass and high pass filters 7. Three terminal IC voltage regulator 8. 8085 microprocessor – simple programs 9. Amplitude Modulation 10. Preparation of PCB 			
Outcomes	<ul style="list-style-type: none"> ➤ The students will be able to understand the working principle of special devices, construct filters and regulators. He will be also able to write simple programs in microprocessor and can construct regulated power supplies, and design PCB. 			