C. Abdul Hakeem College (Autonomous), Melvisharam.

Affiliated to Thiruvalluvar University, Vellore.
Re-accredited by NAAC with 'A' Grade.
Hakeem Nagar, Melvisharam – 632 509, Vellore District.

BACHELOR OF SCIENCE | PHYSICS ALLIED
DEGREE COURSE | UNDER CBCS
(with effect from 2018-2019)

Sem	Subject code	Course Title		Hrs. Per Week	Credits	Max. Marks		Total
						CIA	ESA	
		B.Sc., Mathematics / Chemistry						
I	U18APH101	Allied-1	Physics - I	6	4	25	75	100
II	U18APH201	Allied-2	Physics - II	6	4	25	75	100
II	U18APHP21	Allied Practical	Allied Practical Physics	6	2	25	75	100

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Syllabus for B.Sc., Mathematics / Chemistry effective from the year 2018-2019

Year:	I Year	Subject Code :	U18APH101	Semester :	I
Allied - 1	Title:	**PHYSICS - I**			
Credits:	4			Max. Marks. 75	

Objectives: To learn concise ideas about basic physics and their applications in day to day life

Unit 1: Properties of Matter

Elasticity – Hookes Law – Different moduli of Elasticity – Poisson's ratio – Theory of non-uniform bending - determination of Young's modulus by non-uniform bending (pin and microscope) - Torsional pendulum – Expression for period of oscillation - determination of rigidity modulus without masses (experiment).

Viscosity – Streamlined and turbulent flow – Poiseuille's formula for the flow of a liquid through a capillary tube - Determination of coefficient of viscosity of a liquid (variable pressure head) – Poiseuille's method.

Surface tension – Jaegar's method to determine surface tension – Variation of surface tension with temperature.

Unit 2: Mechanics

Newton's law of gravitation – Mass and mean density of the earth - Kepler's laws - Determination of gravitational constant – Boy's method.

Laws of floatation – metacentre – metacentric height of a ship – Bernoulli's theorem explanation - venturimeter.

Rocket motion - Principle –Theory – Velocity of rocket – Rocket propulsion systems – Multistage rockets - Artificial satellites.

Unit 3: Thermal Physics

Heat engine – Efficiency – Carnot's Theorem – Otto and Diesel engines – Construction, working and efficiency.

Coefficient of thermal conductivity – Determination of thermal conductivity of a bad conductor by Lee's disc method - Practical applications of conduction of heat.

Regenerative cooling - Liquefaction of air (Linde's process) – Liquefaction of helium (Onnes method) – applications of low temperatures.

Unit 4: Electricity and Magnetism

Potentiometer – Principle – Calibration of low range voltmeter and ammeter - Principle of a capacitor – Parallel plate capacitor – Spherical capacitor - Energy stored in a capacitor.

Seebeck effect – Laws of thermo E.M.F. – Thermo couple - Determination of Thermo E.M.F. using potentiometer – Applications of thermo-electricity.

Magnetic Induction (B) – Magnetisation (M) - Magnetising field (H) – Relationship between B, H and M – Magnetic susceptibility – Magnetic permeability – Electron theory

of para, dia, and ferro magnetism – Explanation (Qualitative only) - Properties of para, dia and ferro magnetic materials.

Unit 5: Acoustics and Ultrasonics

Transverse waves – Expression for the velocity of transverse waves in a stretched string – Frequency of transverse vibration of stretched strings – verification of laws of transverse vibration of string using sonometer.

Acoustics of building - Reverberation time – Sabine's formula (no derivation) – absorption coefficient – factors affecting acoustics of building.

Introduction to ultrasonics – piezoelectric effect – production of ultrasonic waves by piezoelectric method – uses of ultrasonic waves.

Books for Study:

1. Allied Physics , R. Murugeshan S. Chand & Co., (2005)
2. Properties of Matter and Acoustics, R. Murugeshan and Kiruthiga Sivaprasath, S. Chand & Co., (2014).
3. Mechanics and Mathematical Physics, R. Murugeshan, S. Chand & Co., (2013).
4. Thermal Physics, R.Murugeshan and Kiruthiga Sivaprasath, S. Chand & Co, (2004).
5. Electricity and Magnetism, R. Murugeshan, S. Chand & Co., (2013).
6. Engineering Physics – I, Dr. P. Mani (2106)

Books for Reference:

1. College Physics Volume I and II, A.B. Gupta, Books and Allied (P) Ltd. (2014)
2. Heat and Thermodynamics, Brij Lal and N.Subrahmanyam, S. Chand & Co., (2006).
3. Elements of Properties of Matter, D.S. Mathur, S. Chand & Co. (1999).

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Syllabus for B.Sc., Mathematics / Chemistry effective from the year 2018-2019

Year:	I Year	Subject Code :	U18APH201	Semester :	II
Allied - 2	Title:	**PHYSICS – II**			
Credits:	4			Max. Marks. 75	

Objectives: To learn concise ideas in modern physics and their development.

Unit 1: Optics

Interference – air wedge – expression for the fringe width – experiment to measure the diameter of a thin wire – Diffraction – determination of wave length of light using transmission grating (normal incidence method) – Polarization – Double refraction – Nicol Prism - Optical activity- Specific rotatory power- Laurent's half shade polarimeter.

Unit 2: Atomic Physics

Vector Atom model – Quantum numbers associated with vector atom model – Pauli's exclusion principle – statement, explanation.

Matter waves - Dual Nature - De Broglie Waves — Davisson and Germer's Experiment.

Photoelectric effect – Laws of photoelectric emission – Einstein's photoelectric equation – Millikan's experiment - Photoelectric cells.

Unit 3: Nuclear Physics

Nuclear fission – Energy released in nuclear fission – Bohr and Wheeler's theory – Chain reaction. Nuclear fusion – Carbon-Nitrogen cycle – Proton-Proton cycle – thermonuclear reactions – hydrogen bomb.

Particle accelerators - Betatron - Electron synchrotron - Detection Methods - Scintillation counter- Bubble chamber.

Unit 4: Applied Physics

Principle of fiber optics – acceptance angle - numerical aperture - classification of fibers - losses in fibers - Fiber optic communication system (Block diagram only).

Lasers - Components of Laser – Types of Laser- Semiconductor Laser – Applications.

Holography – Principle – Recording of hologram – Reconstruction of the Image – Properties – Applications.

Unit 5: Electronics

Zener diode – Characteristics – Voltage regulator – LED – Construction, working and uses.

Logic gates - AND, OR, NOT, NAND and NOR gates – NAND and NOR as universal gates – Fabrication of integrated circuits – monolithic process - LSI, MSI and VLSI – advantages and limitations of an integrated circuit.

Books for Study:

1. Allied Physics, R. Murugesan S. Chand & Co., (2005)
2. Optics and Spectroscopy , R.Murugesan and Kiruthiga Sivaprasath, S. Chand & Co
3. Modern Physics, R.Murugesan and Kiruthiga Sivaprasath, S. Chand & Co, (2012).
4. Principles of Electronics, V.K. Mehta and Rohit Mehta , S. Chand & Co, (2005).

Books for Reference:

1. College Physics Volume I and II, A.B. Gupta, Books and Allied (P) Ltd (2014).
2. A Textbook of Optics Dr. N.Subrahmanyam, Brij Lal and Dr. M.N. Avadhanulu, S. Chand & Co, (2014)
3. Basic Electronics Solid State, B.L. Theraja, S. Chand & Co, (2004)

C. Abdul Hakeem College (Autonomous), Melvisharam.

Syllabus for B.Sc., Mathematics / Chemistry effective from the year 2018-2019

Year:	I Year	Subject Code :	U18APHP21	Semester :	II
Allied Practical	Title:	**Allied Practical - PHYSICS**			
Credits:	2			Max. Marks. 75	

Objectives :

- To learn the techniques of handling simple measuring instruments in physics
- To measure certain basic mechanical, optical, electrical and magnetic properties of matter.
- To study the characteristics of diode, transistor and ICs and their usage.

(Any 15 Experiments)

1. Young's modulus – non uniform bending – pin and microscope.
2. Rigidity modulus – Static Torsion Method Using Scale and Telescope.
3. Rigidity modulus – Torsional oscillation method (without symmetric masses).
4. Determination of Co-efficient of Viscosity – Graduated Burette method.
5. Surface Tension and Interfacial Tension – By drop weight method.
6. Specific Heat Capacity of a liquid – by Newton's Law of Cooling.
7. Sonometer – A.C. Frequency using steel wire.
8. Sonometer – Frequency of tuning fork.
9. Newton's Rings – Radius of Curvature.
10. Air Wedge – Determination of thickness of thin wire.
11. Spectrometer - Grating – Minimum Deviation – Mercury spectrum.
12. Spectrometer – Refractive Index of a liquid – Hollow Prism.
13. Potentiometer – Calibration of High Range Ammeter.
14. Potentiometer – Calibration of Low Range Voltmeter.
15. Determination of m and B_H using Deflection Magnetometer in Tan C position and vibration magnetometer.
16. Figure of merit and voltage sensitiveness of table galvanometer.
17. Construction of AND, OR gates using diodes and NOT gate by transistors.
18. Zener diode – Voltage Regulation.
19. NAND as universal gate.
20. NOR as universal gate.
21. De Morgan's theorems verification.

Books for study & reference:

1. A Text book of Practical Physics, M.N.Srinivasan, S.Balasubramanian and R.Renganathan, Sultan Chand & Sons, New Delhi, 2005.

C.C Ouseph, G.Rangarajan- A Text Book of Practical Physics- S. Viswanathan Publisher-Part I 1990