SYLLABUS: Allied Physics for Chemistry –II				
UNIT	CONTENT	Hours	COs	Bloom's Taxonomy Level
I	**Quantum Physics** Vector atom model – Coupling schemes – Doublet structure of sodium D-line - Pauli's exclusion principle – Heisenberg Uncertainty Principle- Dual nature of matter waves – De Broglie concept of matter wave-Group velocity and phase velocity – Davisson and Germer experiment - Wave function and its properties-Schrodinger time dependent equation and time independent equation - Particle in a box.	12	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
II	**Spectroscopy** Electric Dipole moment-rigid rotor and Principles of microwave spectroscopy- Rotation of H_2O molecule - Vibration of diatomic molecules-Infrared Spectra. Polarizability-Raman effect-Classical theory of Raman effect. Magnetic moment of proton-Principles of NMR-Application-MRI.	12	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
III	**Energy Storage devices/Transducers** Faraday's laws of electrolysis-Primary cell-Secondary cell-construction and working of Lead acid battery, Lithium Ion battery – Hydrogen fuel cell Super capacitor – electrical double layer-pseudo capacitors Transducers – Strain gauge- Gauge factor – Displacement Transducer –Capacitive and Piezo electric transducer-Photosensitive devices-Photodiode, Phototransistor, and LDR	12	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
IV	**Nuclear Physics** Nucleus – Classification of Nuclei – Nuclear Size – Charge – Mass and Spin- Liquid drop model – shell model – Magic numbers - Mass-energy equivalence-Derivation of $E=mc^2$. Nuclear fusion and Nuclear fission -Chain reaction-Nuclear reactor – construction and working - C^{14} dating-Radioactive dating	12	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
V	**Digital Electronics** Binary number and Binary arithmetic (Addition, Subtraction) – Binary Subtraction by 1's and 2's complement method-Logic gates – OR, AND, NOT, XOR, NAND and NOR gates – truth tables – Half adder and Full adder circuits – Laws and theorems of Boolean's algebra – De Morgan's theorems.	12	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5

Text Books

1. Applied Physics for engineers by Mehta, Neeraj, PHI Learning Pvt. Ltd.
2. Electrochemical Components by Marie-Cécile Pera, Daniel Hissel, Hamid Gualous, Christophe Turpin, 2013, Wiley-ISTE.
3. Fundamentals of Molecular Spectroscopy by Colin N. Banwell; Elaine M. McCash, Tata McGraw Hill Education Private Limited 2011.
4. Modern Physics by R Murugeshan & Kiruthiga Sivaprasath S Chand Publishing 2019.
5. Modern electronic Instrumentation and Measurement techniques by Helfrick Albert D. and Cooper W. D, Prentice-Hall of India

Reference books

1. Physics for Chemists by Ruslan P. Ozerov, Anatoli A. Vorobyev, Elsevier, 2007.
2. Allied Physics Paper I & II by R Murugesan, S Chand Publishing, 2005.
3. Schaum's Outline of College Physics, 11th Edition By Frederick J. Bueche, Eugene Hecht, McGraw Hill.
4. Modern Physics by Kenneth S. Krane, JOHN WILEY & SONS.
5. Electrochemical power sources: batteries, fuel cells, and supercapacitors by Bagotsky, V.S., Skundin, A.M. and Volfkovich, Y.M., 2015, John Wiley & Sons.
6. Electronic Instrumentation and Measurements by Bell David A., PHI / Pearson Education.

Suggested reading

1. A Textbook of Engineering Physics" by M N Avadhanulu and P G Kshirsagar, S. Chand Publishing.
2. Physics for Scientists and Engineers with Modern Phvsics by Paul M. Fishbane, Stephen G. Gasiorowicz, Stephen T. Thornton, [3rd edition], Pearson Education. Inc.
3. College Physics by Jerry D. Wilson, Anthony J. Buffa, Bo Lou, 7th ed., Pearson Education.
4. Concepts of Modern Physics by Arthur Beiser, McGraw-Hill Higher Education