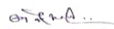


TEACHING AND EXAMINATION SCHEME:

Teaching Scheme			Credits	Marks			Duration of End Semester Examination
L	T	P/D		Sessional	End Semester Exam	Total	
3	1	0	4	40	60	100	3 hrs

COURSE CONTENTS:

Unit	Contents	No. of hours
I	<p>Water Technology: Introduction, Sources, common impurities, Hardness, Degree of hardness and units, water quality parameters and their analysis-Turbidity, TDS, Hardness, Chlorine, Arsenic Test, BOD and COD, Water Softening -Zeolite and Ion-exchange process, Drinking water purification and domestic water purifiers.</p> <p>Electrochemistry: Specific, equivalent and molar conductivity of electrolytic solutions, Reference Electrodes-Calomel electrode and Ag-AgCl electrode, Ion-selective electrode-Glass electrode, determination of pH of solution using glass electrode, Construction and working of Batteries-Lead acid storage battery, Ni-Cd storage cell, Lithium batteries, fuel cell and Solar cell.</p>	10
II	<p>Corrosion Science: Introduction, Chemical and Electrochemical Corrosion, Theory of electrochemical corrosion, Types of Electrochemical Corrosion-Differential aeration corrosion, Pitting Corrosion, Stress Corrosion e.g., Caustic embrittlement. Factors affecting rate of corrosion-Related to metal & related to environment. Control of corrosion.</p> <p>Spectroscopy Techniques:</p> <p>UV-Visible Spectroscopy: principle, Lambert-Beer's Law, instrumentation Electronic Transitions, Auxochromes, Chromophores, Effect of conjugation and solvents on transition of organic molecules, applications.</p> <p>IR: - Principle, Instrumentation, Fundamental vibrations, Hooke's Law, effect of masses of atoms, bond strength, nature of substituent and hydrogen bonding on Vibrational frequency, applications.</p>	10
III	<p>Fuels: Classification of fuels, Calorific value - Definition, HCV, LCV, determination of calorific value of solid and liquid fuels using Bomb calorimeter, Ultimate analysis of coal and numerical problems, Petroleum cracking -fluidized bed catalytic cracking. Reformation of petrol, Quality of liquid fuels- Cetane and</p>	10


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	<p>Octane number, power alcohol-manufacture, advantages and disadvantages, Concept of hydrogen as fuel- types, synthesis by water electrolysis and natural gas reforming.</p> <p>Chemistry in ICT: Introduction and applications of metal and metal oxides like Si, Ge, Al, Ti, Ni, Cu, SiO₂, La₂O₃ and ZrO₂ in communication and Display devices (liquid crystals based, LED, CRT, alumina-silicate glass based, touch screen). Disposal of harmful chemicals used in ICT; Hg, Pb, Cd and flame retardant materials.</p>	
IV	<p>Engineering Materials</p> <p>Polymers: Introduction, Classification, Glass transition temperature, factors affecting Tg and its significances, Synthesis, properties and applications of PP, PVC, PMMA, polyurethanes, Epoxy resins, Silicon Rubber, PET, Lexan, Kevlar.</p> <p>Conducting Polymers: Introduction-Definition, applications, Mechanism of conduction in polyacetylene.</p> <p>Nano- Materials: Introduction, Properties of nanomaterials, Graphene, Fullerenes, Carbon nanotubes, nano wires, nano cones, Application of nano-materials.</p>	10

Text Books:

1. Ramesh, S. and Vairam S. Engineering Chemistry, Wiley India.
2. Puri, B.R., Sharma, L.R., and Pathania, M.S. Principles of Physical Chemistry, Vishal Publishing Co. (2008).
3. Aggarwal, S. Engineering Chemistry: Fundamentals and Applications, Cambridge University Press (2015).

Reference Books:

1. Brown, H., Chemistry for Engineering Students, Thompson.
2. Sivasankar, B., Engineering Chemistry, Tata McGraw-Hill Pub. Co. Ltd, New Delhi (2008).
3. Shulz, M. J. Engineering Chemistry, Cengage Learnings (2007).