Lesson Plan

Name : Dr. Yameeka Discipline : Civil,Arch, Chemical Year : 1st

Subject : Applied chemistry Duration : 16 weeks (04/08/2025 to end of the semester)

Workload : 3 Lectures and 1 Practical per week

Week	Theory		Practical	
	Lecture Day	Topic (including assignment/ test)	Practical Day	Topic
1.	1st	**Unit 1 :**1.1 Bohr's model of atom (qualitative treatment only), dual character of matter: derivation of de-Broglie's eq	1st	1. To prepare standard solution of oxalic acid.
	2nd	Heisenberg's Principle of Uncertainty, modern concept of atomic structure: definition of orbitals		
	3	shapes of s, p and d-orbitals, quantum numbers and their significance		
2. \	1st	Electronic configuration: Aufbau and Pauli's exclusion principles and Hund's rule, electronic configuration of elements up to atomic number 30.	1st	2. To dilute the given KMnO4 solution
	2nd	1.2 Modern Periodic law and Periodic table' classification of elements into s, p, d		
	3rd	f-blocks metals, non-metals and metalloids (periodicity in properties excluded).		
3.	1st	1.3 Chemical bonding: cause of bonding, ionic bond, covalent bond, and metallic bond (electron sea or gas model	1st	3. To find out the strength in grams per litre of an unknown solution of sodium hydroxide using a standard (N/10) oxalic acid solution..
	2nd	Physical properties of ionic, covalent and metallic substances and Revision		
	3rd	**Assignment 1 checking**		
4.	1st	**UNIT 2** Metals and Alloys 2.1 Metals: mechanical properties of metals such as conductivity, elasticity, strength	1st	4. To find out the total alkalinity in parts per million (ppm) of a water sample with the help of a standard sulphuric acid solution
	2nd	stiffness, luster, hardness, toughness, ductility, malleability, brittleness, and impact resistance and their uses		
	3rd	2.2 Definition of a mineral, ore, gangue, flux and slag.		
5.	1st	Metallurgy of iron from haematite using a blast furnace. Commercial varieties of iron	1st	5. To determine the total hardness of given water sample by EDTA method
	2nd	.2.3 Alloys: definition, necessity of making alloys, composition, properties and uses of duralumin		
	3rd	steel. Heat treatment of steel- normalizing, annealing, quenching, tempering steel. Heat treatment of steel- normalizing, annealing, quenching, tempering		
6.	1st	Revision	1st	6. To determine the amount of total dissolved solids(TDS) in ppm in a given sample of water gravimetrically
	2nd	**Assignment2 Checking** **Class/Home Work Checking**		
	3rd	**UNIT 3** 3.1 Solutions: definition, expression of the conc. of a solution in percentage (w/w, w/v and v/v		
7.	1st	normality, molarity and molality and ppm. Simple problems on solution preparation.	1st	7. To determine the pH of different solutions using a digital pH meter
	2nd	Arrhenius concept of acids and bases, strong and weak acids and bases.		
	3rd	pH value of a solution and its significance, pH scale. Simple numerical problems on pH of acids and bases.		
8.	1st	3.4 Hard and soft water, causes of hardness of water, types of hardness – temporary and permanent		**Revision**

		hardness, expression of hardness of water, ppm unit of hardness		
	2nd	Disadvantages of hard water; removal of hardness: removal of temporary hardness by boiling and Clark's method;.	**2nd**	8. To determine the calorific value .
	3rd	removal of permanent hardness of water by Ion-Exchange method; boiler problems caused by hard water: scale and sludge formation, priming and foaming,		
9.	**1st**	caustic embrittlement; water sterilization by chlorine, UV radiation and RO. **Assignment checking.**	**1st**	9. To determine the viscosity of a lubricating oil using a Redwood viscometer.
	2nd	**Unit4 Fuel** Definition and classification of fuel Definition of calorific value, HCV and LCV.Composition and refining of petroleum	**2nd**	
	3rd	(a) Composition, properties and uses of CNG, PNG, LNG, LPG, ADVANTAGES OF LIQUID AND GASEOUS FUEL ON SOLID FUELS. Scope of hydrogen as fuel.		
10.	**1st**	**Revision and Assignment**		10. To prepare a sample of Phenol-formaldehyde resin (Bakelite)/Nylon-66 in the lab
	2nd	**Lubricants** Lubricant and lubrication, Functions of lubricants, Classification of lubricants: solid, semisolid and liquid lubricants with examples.		**Revision**
	3rd	Lubrication mechanism in brief Physical properties-oiliness, viscosity, viscosity index, cloud point, pour		**Revision**
11.	**1st**	a) point, flash point, fire point, ignition temperature, pour point		**Revision**
	2nd	**Reevision**		
	3rd	**Assignment**		**Revision**
12.	**1st**	**Unit5: Polymer and Electrochemistry** Definition of polymer, classification Monomer, Degree of Polymerization, Brief introduction to addition and condensation polymers.		
	2nd	Preparation, properties and uses of PVC, Nylon-66, Bakelite		
	3rd	Definition of plastics, thermoplastic and thermosetting polymer with example.		
13.	**1st**	Natural rubber and neoprene, other synthetic rubber (only name		
	2nd	Revision		
	3rd	Assignment		
14.	**1st**	**Corrosion-dry, wet, factors affecting corrosion**		
	2nd	**Method of prevention**		
	3rd	Introduction and application of nanotechnology		
15.	**1st**	Assignmrnt		
	2nd	Revision		
	3rd	Revision		
16	**1st**	Revision		
	2nd	Revision		
	3rd	Revision		