## Lesson Plan

Name	:	Ms. Naveen Rathi		
Discipline	:	Civil Engg.		
Year	:	1 <sup>st</sup> semester		
Subject :	:	Chemistry		
Code	:	20016		
Duration	:	15		
Work Load	: 3 Lectures and 2 Practical			
per week				
Weeks	(1 Sept 2023 to Dec. 2023)			

	Theory		Practical
Week	Lecture	Торіс	Торіс
1 <sup>st</sup>	1 <sup>st</sup>	Bohr's model of atom (qualitative treatment only), dual character of matter	1 To prepare standard solution
	2 <sup>nd</sup>	Derivation of de-Broglie's equation	of oxalic acid
	3rd	Heisenberg's Principle of Uncertainty	
2 <sup>nd</sup>	1 <sup>st</sup>	Modern concept of atomic structure: definition of orbitals, shapes of s, p and d-orbitals	2. To dilute the given KMnO4
	2 <sup>nd</sup>	Quantum numbers and their significance. Electronic configuration	solution
	3rd	Aufbau and Pauli's exclusion principles and Hund' rule,	
3rd	1 <sup>st</sup>	Electronic configuration of elements up to atomic number 30.	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.
	2 <sup>nd</sup>	Modern Periodic law and Periodic table,	
	3rd	Classification of elements into s, p, d and f- blocks	
4 <sup>th</sup>	1 <sup>st</sup>	Metals, non-metals and metalloids (periodicity in properties excluded).	4. To find out the total alkalinity in parts per million (ppm) of a water sample with the help of a standard
	2 <sup>nd</sup>	Chemical bonding: cause of bonding	sulphuric acid solution.
	3rd	Ionic bond, covalent bond, and metallic bond (electron sea or gas model),	
5 <sup>th</sup>	1 <sup>st</sup>	Physical properties of ionic, covalent and metallic substances	

	2 <sup>nd</sup>	Assignment 1	5. To determine the total
	3rd	Revision of unit 1/ Problem solving	hardness of given water sample by EDTA method
6 <sup>th</sup>	1st SESSIONAL TEST (UNIT 1 )		
7 <sup>th</sup>	1 <sup>st</sup>	Metals: mechanical properties of metals such as conductivity, elasticity, strength and stiffness, luster, hardness, toughness, ductility, malleability, brittleness, and impact resistance and their uses.	6. To determine the amount of total dissolved solids(TDS) in ppm in a given sample of water gravimetrically
	2 <sup>nd</sup>	Definition of a mineral, ore, gangue, flux and slag. Metallurgy of iron from haematite using a blast furnace. Commercial varieties of iron	
	3rd	Alloys: definition, necessity of making alloys, composition, properties and uses of duralumin and steel. Heat treatment of steel- normalizing, annealing, quenching, tempering.	
8 <sup>th</sup>	1 <sup>st</sup>	Solutions: definition, expression of the concentration of a solution in percentage (w/w, w/v and v/v), normality, molarity and molality and ppm. Simple problems on solution preparation.	7. To determine the pH of different solutions using a digital pH meter
	2 <sup>nd</sup>	Arrhenius concept of acids and bases, strong and weak acids and bases, pH value of a solution and its significance, pH scale. Simple numerical problems on pH of acids and bases.	
	3rd	Hard and soft water, causes of hardness of water, types of hardness – temporary and permanent hardness, expression of hardness of water, ppm unit of hardness	
9th	1 <sup>st</sup>	Disadvantages of hard water; removal of hardness: removal of temporary hardness by boiling and Clark's method; removal of permanent hardness of water by Ion-Exchange method	8. To determine the calorific value of a solid/liquid fuel using a Bomb calorimeter.
	2 <sup>nd</sup>	Boiler problems caused by hard water: scale and sludge formation, priming and foaming, caustic embrittlement; water sterilization by chlorine, UV radiation and RO.	
	3 <sup>rd</sup>	Revision / Problem solving/Assignment 2	
10 <sup>th</sup>	2 <sup>NI</sup>	<sup>o</sup> SESSIONAL TEST ( UNIT 2.5 – 2.9 & UNIT 3)	
11 <sup>th</sup>	1st Ord	Fuels: definition and classification of higher and lower calorific values, units of calorific value, characteristics of an ideal fuel. Petroleum: composition and refining of petroleum;	9. To determine the viscosity of a lubricating oil using a Redwood viscometer
	4	Gaseous racis, composition, properties and uses of	

3rd	CNG, PNG, LNG, LPG; relative advantages of liquid and gaseous fuels over solid fuels. Scope of hydrogen as future fuel.	
	lubricant, classification of lubricants with examples; lubrication mechanism (brief idea only); physical properties (brief idea only) of a lubricant: oiliness, viscosity, viscosity index, flash and fire point, ignition temperature, pour point.	
12 <sup>th</sup> 1 <sup>st</sup>	Polymers and Plastics: definition of polymer, classification, addition and condensation polymerization; preparation properties and uses of polythene, PVC, Nylon-66, Bakelite;	10. To prepare a sample of
2 <sup>nd</sup>	Definition of plastic, thermoplastics and thermosetting polymers; natural rubber and neoprene, other synthetic rubbers (names only).	Phenol-formaldehyde resin (Bakelite)/Nylon-66 in the lab.
3rd	Corrosion: definition, dry and wet corrosion, factor affecting rate of corrosion, methods of prevention of corrosion—hot dipping, metal cladding, cementation, quenching, cathodic protection methods	
13 <sup>th</sup> 1 <sup>st</sup>	Introduction and application of nanotechnology: nano-materials and their classification, applications of nanotechnology in various engineering applications (brief). Revision/Class Test	Revision
3rd	Assignment 3	
14 <sup>th</sup>	3 <sup>rd</sup> SESSIONAL TEST ( UNIT 4 & UNIT 5)	
15 <sup>th</sup> 1 <sup>st</sup> 2 <sup>nd</sup> 3 <sup>rd</sup>	Oral test Written test Revision	Revision & Checking of practical note books