LESSON PLAN OF APPLIED CHEMISTRY

DISCIPLINE : **All Branches**	SEMESTER : **2nd**	NAME OF THE TEACHING FACULTY : NAMITA BEHERA
SUBJECT : **APPLIED**	NO. OF DAYS/PER WEEK CLASS	SEMESTER FROM DATE :4/2/2025 TO DATE: 17/5/2025
WEEK :	**CLASS DAY :**	**THEORY TOPIC :**
1ST	1ST	Rutherford model of atom
	2ND	Bohr's theory (expression of energy and radius to be omitted), and hydrogen spectrum explanation based on Bohr's model of atom,
	3RD	Heisenberg uncertainty principle, Quantum numbers
	4TH	orbital concept. Shapes of s,p and d orbitals, Pauli's exclusion principle
2ND	1ST	Hund's rule of maximum multiplicity Aufbau rule, electronic configuration.
	2nd	Concept of chemical bonding – cause of chemical bonding, types of bonds: ionic bonding
	3rd	(NaCl example), covalent bond (H2, F2, HF hybridization in BeCl2, BF3
	4th	CH4, NH3, H2O), coordination bond in NH4+, and anomalous properties of NH3, H2O due to hydrogen bonding, and metallic
3RD	1st	Solution – idea of solute, solvent and solution, methods to express the concentration of solution molarity (M = mole per liter),
	2nd	ppm, mass percentage, volume percentage and mole frac tion.
	3rd	Graphical presentation of water distribution on Earth (pie or bar diagram). Classification of soft and hard water based on soap test
	4th	salts causing water hardness, unit of hardness and simple numerical on water hardness.
4TH	1st	Cause of poor lathering of soap in hard water, problems caused by the use of hard water in boiler (scale and sludge, foaming
	2nd	priming, corrosion etc), and quantitative measurement of water hardness by ETDA method,
	3rd	Water softening techniques – soda lime process, zeolite process and ion exchange process.
	4th	Municipal water treatment (in brief only) – sedimentation, coagulation, filtration, sterilization.
5TH	1ST	Water for human consumption for drinking and cooking purposes from any water sources
	2ND	Natural occurrence of metals – minerals, ores of iron, aluminium and copper
	3RD	gangue (matrix), flux, slag, metallurgy- brief account of general principles of metallurgy
	4TH	Extraction of - iron from haematite ore using blast furnace
6TH	1ST	aluminium from bauxite along with reactions.
	2nd	Alloys – definition, purposes of alloying, ferrous alloys and non-ferrous with suitable examples, properties and applications

	3rd	General chemical composition , composition based application: Portland cement and hardening
	4th	Glasses Refractory and Composite materials
7TH	1st	Polymers – monomer, homo and co polymers, degree of polymerization
	2nd	simple reactions involved in preparation a nd their application of thermoplastics and thermosetting plastics
	3rd	PVC, PS, PTFE, nylon – 6, nylon-6,6 and Bakelite
	4th	rubber and vulcanization of rubber.
8TH	1st	Unit 4: Chemistry of Fuels and Lubricants
	2nd	Definition of fuel and combustion of fuel, classification of fuels
	3rd	Calorific values (HCV and LCV), calculation of HCV and LCV using Dulong's formula, Proximate analysis of coal solid fuel, petrol and doesel- fuel rating
	4th	Chemical composition, calorific values and applications of LPG
9TH	1ST	CNG, water gas, coal
	2ND	producer gas and biogas
	3RD	Lubrication – function and characteristic properties of good lubricant
	4TH	classification with examples,
10TH	1ST	lubrication mechanism
	2nd	hydrodynamic and boundary lubrication
	3rd	physical proper- ties
	4th	viscosity and viscosity index
11TH	1st	oiliness, flash and fire point
	2nd	could and pour point
	3rd	chemical properties
	4th	coke number, total acid number
12TH	1st	saponification value
	2nd	Unit 5: Electro Chemistry
	3rd	Electronic concept of oxidation, reduction and redox reactions
	4th	Definition of terms: electrolytes, non-electrolytes with suitable examples

13TH	1ST	Faradays laws of elactrolysis
	2ND	simple problems
	3RD	Industrial Application of electrolysis- Electrometallurgy
	4TH	Electroplating and Electrolytic refining
14TH	1ST	Application of redox reaction in electrochemical cells- primary cells, dry cell
	2nd	secondary cell- commercially used lead storage battery
	3rd	fuel and solar cell
	4th	Introduction to Corrosion of metals- definition, types of corrosion (chemical and electrochemical)
15TH	1st	H2 liberation and O2 absorption mechanism of electrochemical corrosion
	2nd	factors affecting rate of corrosion
	3rd	Internal corrosion preventing measures - Purification, alloying heat treatment
	4th	External corrosion preventive measures: a) metal (anodic, cathodic) coatings, b) organic

Namita Behera.

Signature of Faculty

Principal

Govt. polytechnic, Dhenkanal