LESSON PLAN FOR ENGINEERING CHEMISTRY
SESSION -2023-24(2ND SEM)

Discipline: ME,EE	Semester:2ND		Name of teaching faculty: Amrita Aiswarya Nanda/ Jyotirmayee Behera
Subject: Engineering chemistry	No's of days per week class allotted :4		Semester Start From: 06/02/2024 - 02/05/2024
Week	Class day		Theory topics
1	1	1	Atomic structure-Fundamental particles-electron, proton and neutron, atomic number and mass number
	2		Rutherford's atomic model – its postulates and failure
	3		Isotopes , Isobars and Isotones with examples and properties
	4		Bohr's model – postulates and failure , Bohr-Bury scheme
2	1		Electronic configuration of elements , Pauli's exclusion principle ,
	2 2		Pauli's exclusion principle , Afbau's principle and Hund 's rule of maximum multiplicity
	3	2	Chemical Bonding-Electrovalent bond –definition with examples
	4		Bonding in NaCl and $MgCl_2$
3	1		Covalent bond- definition and bonding in H_2 , O_2, Cl_2, NH_3, CH_4 , H_2O
	2		Coordinate bond – definition and bonding in H_3O^+, NH^{4+} and SO_2
	3	3	Acid and base- Arrhenius , Bronsted and lowry theory with examples
	4		Lewis theory - postulates and limitations theory with examples
4	1		Neutralisation reaction , definition of salt and its types
	2		Double salt , complex salt and mixed salt – definition with examples
	3		Complex salt and Mixed salt – definition with examples
	4	4	Solution – Atom and Atomic weight –explanation
5	1		Molecular weight –definition and calculation
	2		Equivalent weight and numericals; determination of equivalent weight of acid, base and salt . Problem solving
	3		Normality- definition and problem discussion
	4		Molarity and Molality – problems
6	1		PH-definition and problems; importance of PH in indusdtry
	2	5	Electrochemistry- Conductors and non-conductors , definition with examples
	3		Types of conductors , Degree of ionisation

	4		Electrolytes – strong and weak electrolyte and their differences
7	1		Electrolysis – theory and procedure
	2		Electrolysis of aqueous and molten NaCl ; statement ,
	3		Faradays laws of electrolysis- mathematical expression
	4		Applications of electrolysis-electroplating ,zinc plating and electrotyping
8	1	6	Corrosion –definition and its types ; mechanism
	2		Protection from corrosion- alloying, galvanizing and painting
	3	7	Metallurgy – ores and gangue with examples
	4		Methods of extraction of metals- ore dressing , gravity separation, magnetic separation , froth floatation and leaching
9	1		Methods of extraction of metals- calcinations and roasting ; smelting – examples of flux and slag ; electro-refining and distillation
	2	8	Alloys- definition and types – Ferro , Non- Ferro and amalgam ; preparation of alloys
	3		Composition and uses of brass, bronze, alnico, duralumin, bell metal, gun metal ,steel
	4	9	Organic compounds classification and characteristics ; saturated and unsaturated – definition with examples
10	1		Difference between aliphatic and aromatic hydrocarbons (Huckel's rule)
	2		Alkanes , alkenes and alkynes – IUPAC nomenclature
	3		Problems of nomenclature- naming rules and examples
	4		Uses and properties of aromatic compounds-benzene, toluene, naphthalene, anthracene , BHC, phenol and benzoic acid
11	1	10	Water treatment- sources of water , hard and soft water ; applications of water
	2		Types of hardness; its removal by lime soda method
	3		Hot lime and cold lime ; advantages ; organic ion-exchange method(principle , process and regeneration of exhausted resins)
	4	11	Lubricants-definition and types- solid lubricants with examples
12	1		Lubricants-definition and types- solid lubricants with examples Liquid and semi-solid lubricants with examples ; purpose of lubrication
	2	12	Fuels – derfinition and classification of fuels; calorific value of fuel and its determination
	3		Solid fuel- wood and coal – compostion and uses ;liquid fuel – diesel petrol and kerosene- composition and uses
	4		Gaseous fuel – composition and uses ; LPG , CNG and coal gas
13	1	13	Monomer and polymer ; types and classification;Thermoplastic and thermosetting – differences;composition and uses of polythene, pvc and bakelite
	2		Natural rubber – vulcanization ; synthetic rubber – BuNa S , BuNa N
	3	14	Chemicals in agriculture – pesticides- uses and examples
	4		Insecticides , herbicides-definition example and uses
14	1		Bio fertilizers- definition example and uses
	2		Revision
	3		Revision
	4		Revision
15	1		Revision
	2		Revision
	3		Revision
	4		Revision

A.Nanda