Daffodil Institute of IT

Department of ALL Technology

Semester Plan

Course Title: Chemistry

Course Code: 65913

Semester: 1st

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Course Objective:

To be able to …

1. Understand mole concept and volumetric analysis.
2. Represent the formation of bonds in molecules.
3. Able to select appropriate materials used in construction.
4. Apply knowledge to enhance operative life span of engineering material and structure by various protective methods

Short Description:

- Chemistry is a basic science subject which is essential to all engineering courses.
- It gives knowledge of engineering material, their properties related application and selection of material for engineering application.
- It is intended to teach student the quality of water and its treatment as per the requirement and selection of various construction materials and their protection by metallic and organic coatings.
- The topics covered will provide sufficient fundamental as well as background knowledge for the particular

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Course Structure:

Sl. No	Subject Code	Name of the subject	T	P	C	MARKS				
						Theory		Practical		TOTAL
						TC	TF	PC	PF	
1	65913	Chemistry	3	3	4	60	90	25	25	200

Course Plan:

Class	Chapter	Detail Description
01	**01**	**1. Understand Atomic Structure and Chemical Bond.** 1.1 Define element, atoms, molecules, Fundamental particle of atom, their mass, charge, location. 1.2 Define atomic number, mass number, Isotope, Isotone and Isobar.
02		**1. Understand Atomic Structure and Chemical Bond.** 1.3 Explain electronic configuration based on **Hunds Rule**, **Aufbau's principle**, **Paulis exclusion principle**. 1.4 Define atomic weight, equivalent weight of an element, molecular weight, mole in terms of number, mass, volume.
03		**1. Understand Atomic Structure and Chemical Bond.** 1.5 Define symbol, valence and formula. 1.6 Explain Chemical bond, octet rule.
04		**1. Understand Atomic Structure and Chemical Bond.** 1.7 Explain Formation of various types of chemical bonds: Covalent, Ionic, Co-ordinate bond. 1.8 Explain the bonding along with example CH_4, H_2, O_2, NaCl, $MgCl_2$.
05		**1. Understand Atomic Structure and Chemical Bond.** 1.9 Explain Quantum number, Orbit and Orbital.
06		**1. Understand Atomic Structure and Chemical Bond.** 1.9 Explain Quantum number, Orbit and Orbital.
07	**02**	**2. Understand Ionic Equilibrium.** 2.1 Explain the concept of acid, base, salt and types of salts. 2.2 Define p^H, p^{OH}, p^H scale.
08		**2. Understand Ionic Equilibrium.** 2.3 Distinguish between basicity of an acid and acidity of a base. 2.4 State normality, molarity, molality, volumetric analysis.
09		**2. Understand Ionic Equilibrium.** 2.5 Explain Titration and Indicator. 2.6 Describe buffer solution and its mechanism.
10	**03**	**3. Understand chemical reaction, oxidation and reduction.** 3.1 Define Chemical reaction and explain the various types of chemical reaction.
11		**3. Understand chemical reaction, oxidation and reduction.** 3.2 Explain the full meaning of a chemical equation. 3.3 State the concept of catalyst.
12		**3. Understand chemical reaction, oxidation and reduction.** 3.4 Explain the modern concept of oxidation and reduction.
13		**3. Understand chemical reaction, oxidation and reduction.** 3.5 Describe the simultaneous process of oxidation and reduction. 3.6 Explain the oxidation number.
14	**04**	**4. Understand Water Treatment.** 4.1 State the concept of hard and soft water.

		4.2 Define hardness of water.
15		**4. Understand Water Treatment.** 4.3 Describe the softening method of permuted process and ion exchange resin process.
16		**4. Understand Water Treatment.** 4.4 Mention the advantages and disadvantages of hard water in different industries. 4.5 Visit a water treatment plant writes a report.
17	**05**	**5. Understand Corrosion and Alloy.** 5.1 Mention the types of corrosion (dry and wet corrosion). 5.2 Describe atmospheric corrosion, types of atmospheric corrosion and their mechanism, oxide films factors affecting atmospheric corrosion.
18		**5. Understand Corrosion and Alloy.** 5.3 Explain electrochemical corrosion, mechanism of electrochemical corrosion, types of electrochemical corrosion. Factors affecting electrochemical corrosion.
19		**5. Understand Corrosion and Alloy.** 5.4. Explain protective measures against corrosion: Coating (Galvanic and Zinc, Organic coating agents, Electroplating, metal cladding)
20		**5. Understand Corrosion and Alloy.** 5.5 Explain the concept of alloy.
21	**06**	**6. Understand the Concept of Organic Chemistry and Introduction to polymers.** 6.1 Mention types of Chemistry. 6.2 Mention the catenation property of carbon.
22		6.3 State organic compounds, its properties and applications.
23		**6. Understand the Concept of Organic Chemistry and Introduction to polymers.** 6.4 Explain the classification of organic compound by structure and
24		**6. Understand the Concept of Organic Chemistry and Introduction to polymers.** functional group: Define Homologous series, Alkanes, Alkenes and Alkynes; properties and uses of general formula; Names and structure of first five members hydrocarbons.
25		**6. Understand the Concept of Organic Chemistry and Introduction to polymers.** 6.5 Explain polymer, monomer, classification of polymers, polymerization, addition and condensation polymerization. 6.6 Define plastics and explain its types and uses.
26	**07**	**7. Understand Glass and Ceramic.** 7.1 Define glass and its constituents; classify glasses,
27		**7. Understand Glass and Ceramic.** give elementary idea of manufacturing process of glass.
28		**7. Understand Glass and Ceramic.** 7.2 Give introduction to ceramic materials and its constituent.

29		**7. Understand Glass and Ceramic.** 7.3 Describe industrial application of glass and ceramic. 7.4 Visit industry and write a report.
30	**08**	**8. Understand Soap and Detergent.** 8.1 Give introduction to Lipid, Fats and oils.
31		**8. Understand Soap and Detergent.** 8.2 Explain saponification of fats and oils, manufacturing of soap.
32		**8. Understand Soap and Detergent.** 8.3 Describe synthetic detergent, types of detergents and its manufacturing.
33		**8. Understand Soap and Detergent.** 8.4 State exclusives: TNT, RDX, Dynamite.
34		**8. Understand Soap and Detergent.** 8.5 Define paint and varnish. 8.6 Describe adhesives.
35	**09**	**9. Cement, pulp and papers.** 9.1 Classify cement and mention its uses and manufacturing process.
36		**9. Cement, pulp and papers.** 9.1 Classify cement and mention its uses and manufacturing process.
37		**9. Cement, pulp and papers.** 9.2 Describe manufacturing process of pulp
38		**9. Cement, pulp and papers.** 9.2 Describe manufacturing process of papers. 9.3 Conduct industry visit and reporting.

PRACTICAL:

1. Practice the use of laboratory tools and safety measures.

2. Conduct observation and measurement.

2.1 Determine the strength of HCl solution using 0.1N Na_2CO_3

2.2 Determine the strength of NaOH by using 0.1N HCl solution.

3. Perform qualitative analysis of known and unknown salts.

3.1 Identify known salt (sample Copper, Iron, Aluminum, led, Ammonium and Zinc salt.)

3.2 Identify unknown basic radical (e.g. led, Copper, Iron, Zinc, Aluminum, Ammonium)

3.3 Identify unknown acid radicals (e.g. Chloride, Nitrate, Sulphate, Carbonate)

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