PTAC 101- APPLIED CHEMISTRY

DIPLOMA IN MECHANICAL ENGINEERING
(Production)
(SEMESTER-I)

L	T	P			CT		ES		Total (s)	Credits
3	0	0			20		50		70	3

CO1	Basic Understanding of Molecular Structure and Chemical Bonding.	**K1**
CO2	Developed Understanding of the Characteristics of Fuels and Lubricants.	**K2**
CO3	Understanding of Water Quality and its Assessment.	**K3**
CO4	Basic Understanding of Electrochemical Cell and Applications.	**K4**
CO5	Basic Ideas and Advantageous of Organic Molecule and Polymers.	**K5**

1. **Atomic Structure and Chemical Bonding** (**14 periods**)
   1.1 Fundamental Particles- Electrons, Protons and Neutrons.
   1.2 Bohr's Model of Atom.
   1.3 Definition of orbit and orbitals, shapes of s and p orbitals
   1.4 Modern Concept of Chemical Bonding: Sigma and Pi Bond. Elementary idea of Hybridization (e.g., NH_3 and H_2O), Molecular Orbital Theory (e.g., N_2 and O_2).
2. **Fuels and Lubricants** **(18 periods)**
   2.1. Definition, Classification, and Characteristics of Fuels.
   2.2. Calorific Value- Determination of Calorific Value Using Bomb Calorimeter Method.
   2.3. Lubricants: Definition and Properties.
   2.4. Industrial Application of Lubricants.
3. **Water and its Treatment** **(14 periods)**
   3.1 Classification of Water – Soft Water and Hard Water.
   3.2 Disadvantages Caused By the Use of Hard Water
   3.3 Removal of Hardness -Permutit Process.
   3.4 Definition of B.O.D and C.O.D.
4. **Electrochemistry and Corrosion** **(14 periods)**
   4.1 Electrochemical Cell.
   4.2 Electrode Potential and Nernst Equation.
   4.3. Definition of Corrosion and Factors Affecting Corrosion.
   4.4. Electrochemical Theory of Corrosion.
5. **Organic Compounds and Polymers** **(10 periods)**
   5.1. Definition and Classification of Organic Compounds.
   5.2. Definition of Polymer, Monomer and Degree of Polymerization.
   5.3 Preparation and Properties of PE, PS, PVC, Teflon and Nylon -66.
   5.4 Applications of Polymers in Industry and Daily Life.

REFRENCE BOOKS

1. Chemistry in Engineering by J.C. Kuricose& J. Rajaram, Tata McGraw Hill, Publishing Company Limited, New Delhi.
2. Engineering Chemistry by P.C. Jain & Monika Jain, Dhanapat Rai Publishing Company, New Delhi.