



ANNEXURE-II

B.Tech. Ist/IInd Semester [Branch: ME, PIE]

Course Name: Engineering Chemistry-II Course Code: CY11102 L:T:P : 2:1:2 Credit: 04

1. **Chemical Kinetics:** Rate of a chemical reaction, factors affecting the rate of reactions: concentration, temperature, pressure and catalyst; elementary and complex reactions, order and molecularity of reactions, rate law, rate constant and its units. [5]
2. **Electrochemical Systems:** Electrochemical cells and EMF, Applications of EMF, Case study for electrorefining process. [4]
3. **Fuels:** Classification, calorific values, analysis of solid fuels, liquid fuels and its properties, refining, cracking and reforming of petroleum, knocking and octane and cetane rating, anti-knocking agents, biofuels. [4]
4. **Corrosion:** Theories of corrosion, type of corrosion, its prevention and control, Case study on corrosion control in industry. [5]
5. **Lubricants:** Definition, functions, mechanisms and classifications of lubricants, properties and testing of lubricants. [4]
6. **Polymers, plastics, rubber and Adhesives:** Polymers, composites, thermoplastic and thermosetting plastics, rubber, biodegradable polymers, adhesives. [4]
7. **Band Theory:** Semiconductors, insulators, doping in semiconducting materials. [2]

Practical: List of Experiments

1. Determination of flash point of oils by Able's apparatus.
2. Determination of flash point of lubricating oil by Pensky Martin's 'closed' tester.
3. To study the viscosity of the given sample of lubricating oil with a Redwood viscometer and to study the viscosity at various temperatures.
4. To find out the aniline point of the given sample of fuel.
5. Determination of Steam Emulsification Number (SEN) of a given lubricating oil.
6. To carry out the % of moisture content only of a given sample of coal as a part of proximate analysis.
7. Determination of viscosity average molecular weight of a polymer sample by Viscometer.
8. Kinetic study of hydrolysis of ethyl acetate by volumetric titration method.

9. Preparation of biodiesel & its flash point determination.

Text Books:

1. *Engineering Chemistry*, Jain & Jain, Dhanpat Rai Publishing Co., New Delhi.
2. *Engineering Chemistry*, Shashi Chawla, Dhanpat Rai Publishing Co., New Delhi.

Reference Books:

1. *Engineering Chemistry- A Textbook*, Harish Kumar Chopra, Anupama Parmar, Narora, New Delhi.
2. *Elements of Physical Chemistry*, Peter Atkins, Julio D. Paula, Oxford, UK.
3. *Polymer Science*, V R Gowariker, N V Viswanathan, Jayadev Sreedhar, New Age International Private Limited, New Delhi.
4. *Inorganic Chemistry: Principles of Structure and Reactivity*, By James E. Huheey, Ellen A. Keiter, Richard L. Keiter, Okhil K. Medhi, Pearson.
5. *Manufacturing Science*, Amitabha Ghosh, Ashok Kumar Mallik, affiliated East-West Press Pvt Ltd, New Delhi.
6. *Advanced Polymer Chemistry -A Problem Solving Guide*, Manas Chandra, Marcel Dekker Inc., New York.
7. *Online resources*.