Year & Sem: P2S2	Course Code: C224	Course Name: Chemistry	No. of Credits: 4	L-T-P: 2-2-1

Syllabus

Unit-I: Aldehydes and Ketones

Introduction, Nomenclature, Physical properties, Reactivity and Chemical properties of Aldehydes and Ketones

Reactions at alpha carbon- Formation of enolate anion, Aldol condensation, Crossed- Aldol condensation, Cannizaro reactions

Unit-II: Carboxylic acids and their derivatives

Introduction, Nomenclature, preparation and properties of carboxylic acids

Carboxylic acid derivatives: Esters, Acid chlorides, amides and acid anhydrides- Preparation and properties

Unit-III: Amines

Introduction, Naming of amines, basicity of amines, Preparation and properties of amines, Preparation and properties of Aniline

Unit-IV: Spectroscopy

Infrared spectroscopy – Principle, Modes of vibrations, Signal characteristics-Wave number, IR spectrum, Identification of functional groups using IR

UV spectroscopy – Principle, Beer-Lambert's law, electronic transitions, Chromophore and auxochromes, Conjugation and color

Unit-V: Proton NMR

Introduction to proton NMR, Nuclear shielding, Chemical equivalence, Chemical shift, Electronegativity and Chemical shift, Diamagnetic anisotropy, integration, Spin-spin splitting, Multiplicity - (n+1) rule, Coupling constant

Unit-VI: Nuclear Chemistry

Radioactive decay- Mass defect and binding energy, Nuclear stability and nuclear equations, types of decay, Writing nuclear equation for alpha, beta and gamma decay, Half life and carbon dating

Practicals:

Detection and confirmation of the following functional groups:
Hydroxyl, carbonyl, carboxylic, amino groups and carbohydrates

References:

1. Organic chemistry, 3rd edition by Janice Gorzynski Smith
2. Organic chemistry by Jonathan Clayden and Nick Greeves
3. Organic chemistry, 6th edition by Robert N. Boyd and Robert T. Morrison
4. Organic chemistry, 7th edition by Paul Bruice
5. Introduction to spectroscopy by Donald L.Pavia, Gary M.Lampman and George S. Kriz
6. Organic Spectroscopy by William Kemp
7. Organic spectroscopy: Principles and applications by Jag mohan