Basic Organic Chemistry - Web course

COURSE OUTLINE

Basic organic chemistry course having sixteen modules covers the knowledge required for the understanding of organic chemistry. The first seven modules focus on the concepts, reactions and mechanisms. Module eight deals with the stereochemistry, while module nine focuses on general methods used for the structural determination of organic compounds. The remaining seven modules illustrate the relevance of organic chemistry to biological, medicinal and material sciences.

COURSE DETAIL

Module No	Topics	Lectures
1	**Electronic Structure and Bonding**: Distribution of electorns in an atom, ionic and covalent bonds, representation of structure, atomic orbitals and bond formation	2
2	**Acids and Bases**:Introduction, acid-base reactions, pKa and pH, buffer solution, Lewis acid and base.	1
3	**Alkanes and Alkyl Halides**: Nomenclature, physical properties, conformation analysis and reactions	3
4	**Alkenes and Alkynes**: Nomenclature, physical properties, conformation analysis and reactions	3
5	**Alcohols, Amines, Ethers and Epoxides**: Nomenclature, physical properties and reactions	3
6	**Carbonyl Compounds**: Nomenclature, physical properties and reactions.	4
7	**Benzene and Substituted Benzenes**: Nomenclature, aromaticity, resonance and reactions.	3
8	**Stereochemistry**: Isomers, constitutional isomers, stereoisomers, optical activity, specific rotation, seperation of enantiomers and reactions.	4
9	**Methods for Structure Determination**: Infrared spectroscopy, NMR spectroscopy and mass spectroscopy.	3

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Chemistry and Biochemistry

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10	**Lipids**: Fatty acids, fats and oils, phospholipids, terpenes, vitamins and streroids.	**2**
11	**Carbohydrates**: Classification, D and L notation, configuration, structure, reactions and synthetic sweeteners.	**3**
12	**Amino Acids, Peptides and Proteins**: Nomenclature, physical properties, classification, structure and bonding, reactions and synthesis.	**2**
13	**Enzymes and Vitamins**: Classification, reaction and mechanism.	**2**
14	**Nucleic Acids**: Nucleosides, nucleotides, DNA, RNA and their biosynthesis.	**2**
15	**Drug Design and Discovery**: Lead compounds, molecular modification, screening, receptors, molecular modeling and antiviral drugs	**1**
16	**Polymers:** Classification, synthesis and applications.	**2**
	Total	**40**

References:

- J. Clayden, N. Greeves, S. Warren, *Organic Chemistry*, 2nd edition, Oxford Unviersity Press, New Delhi, 2012.
- R. T. Morrison, R. N. Boyd, *Organic Chemistry*, 6th edition, Prentice-Hall, New Delhi,1992.
- P. Y. Bruice, K. J. R. Prasad, *Essential Organic Chemistry*, 1st edition, Pearson Education, New Delhi, 2008.