

**CHM 401: Organic Chemistry I (3-0-0-4)**

**No. of Lectures: 42**

Stereochemistry

(15)

Conformational analysis of cyclic, fused and bridged ring compounds. Topicity and prostereoisomerism (topicity of ligands and faces), chemical and biochemical transformations of heterotopic ligands and faces. Conformations Allylic strain ( $A^{1,2}$  and  $A^{1,3}$ ) and other strains (revision).

Dynamic stereochemistry: Conformation and Reactivity. Stereoselective and pericyclic reactions. Molecular dissymmetry and chiroptical properties. ORD, CD, Octant rule, Cotton effect etc.

Mechanistic and Stereochemical Aspects of:

(10)

Baeyer-Villiger, Claisen, Cope, Wagner-Meerwein, Wittig rearrangements, ene and metalloene reactions, [2+2], [3+2], [4+2] cycloadditions, Barton reaction.

Reactive Intermediates:

(12)

- Carbenes: alkenyl, alkynylcarbenes, ketocarbenes, oxacarbenes, carbynes.
- Nitrenes: carbonylnitrenes, halo and azanitrenes.
- Radicals: Structure, reactivity, selectivity and mechanisms of radicals and radical based reactions, involving various functional groups. Radical cations and radical anions.
- Carbocations: Nonclassical carbocation. Sigma and pi participation.
- Benzynes.

Structure and Biosynthesis:

(5)

Prostaglandins, Leukotrienes, and Fatty Acids (in brief)

Books:

1. March, J., "*Advanced Organic Chemistry*," 4<sup>th</sup> ed, 1999
2. Nasipuri, D., "*Stereochemistry of Organic Compounds*," 2<sup>nd</sup> ed, 1995
3. Clayden, J.; Greeves, N.; Warren, S. and Wothers, P. "*Organic Chemistry*," 1<sup>st</sup> ed, 2001
4. Pine, S. H. "*Organic Chemistry*" 5<sup>th</sup> ed., 1987