



**Indian Institute of Technology Gandhinagar**  
**Physical Organic Chemistry (CH 506)**

Credits :	L T P C 3 0 0 4
Prerequisites (if any) :	None
Instructor Name	Chandrakumar Appayee

**Course contents:**

**Aromaticity:** Criteria for aromaticity, Annulenes, Aromaticity in charged rings, Homoaromaticity, Fused ring systems, and Heteroaromatic systems.

**Configuration and Conformation:** Stereogenic and prochiral centers, Resolution, Conformational analysis of acyclic, cyclic and fused systems, Electronic effects, and Stereoselective, stereospecific and enantioselective reactions.

**Reactivity, Kinetics and Mechanism:** Transition state theory, Postulates and principles related to kinetic analysis, Kinetic experiments, Isotope effects, and Substituent effects.

**Acidity and Basicity:** Strength of acids and bases, Concept of pH, pKa, and pI, Hard/soft acids and bases, Electrophilicity and acid/base catalysis, and Basicity vs nucleophilicity.

**Reactive Intermediates:** Bonding, structure, stability and reactivity of carbocations, carbanions, free radicals, arynes, carbenes and nitrenes.

**Text books:**

Advanced Organic Chemistry, Parts A: structure and Mechanisms (5th Edition) Francis A. Carey, Richard J. Sundberg, Springer 2007.

Modern physical organic chemistry Eric V. Anslyn, Dennis A. Dougherty, University Science Books 2006.

Mechanism and Theory in Organic Chemistry (3rd Edition), Thomas H. Lowry and Kathleen S. Richardson, Benjamin-Cummings Pub. Co. 1987.

Stereochemistry of Carbon Compounds E. L. Eliel, Tata McGraw-Hill Education, 1975.

**Reference Books:**

Organic Chemistry, J. Clayden, N Greeves, S. Warren, S. Wothers, Oxford University Press, 2001.

A Guidebook to Mechanism in Organic Chemistry (6th Edition), Peter Sykes, Longman, 2008.