

# M.Sc. ORGANIC CHEMISTRY SYLLABUS



FACULTY OF SCIENCE  
**DEPARTMENT OF CHEMISTRY**  
**SATAVAHANA UNIVERSITY-KARIMNAGAR**  
*UNDER CHOICE BASED CREDIT SYSTEM (CBCS)*

## DEPARTMENT OF CHEMISTRY

SATAVAHANA UNIVERSITY - KARIMNAGAR

### M.SC., CHEMISTRY

Under Choice Based Credit System (CBCS)

#### SU - M.Sc., (CHE) II SEMESTER

Paper Code	Title	Workload Per Week		Marks			Credits	Duration of the Exams.
		Theory	Practical	Internal	University	Total		
MCHE 201T	Inorganic Chemistry-II	4	--	20	80	100	4	3 Hrs
MCHE 202T	Organic Chemistry-II	4	--	20	80	100	4	3 Hrs
MCHE 203T	Physical Chemistry-II	4	--	20	80	100	4	3 Hrs
MCHE 204T	Analytical Techniques & Spectroscopy-II	4	--	20	80	100	4	3 Hrs
MCHE 205P	Inorganic Chemistry LAB-II	--	6	15	60	75	3	4 Hrs
MCHE 206P	Organic Chemistry LAB-II	--	6	15	60	75	3	4 Hrs
MCHE 207P	Physical Chemistry LAB-II	--	6	15	60	75	3	4 Hrs
MFC* 201T	Fundamentals on Computers & Office Automation	2	--	10	40	50	2	2 Hrs
<b>TOTAL</b>		<b>18</b>	<b>18</b>	<b>135</b>	<b>540</b>	<b>675</b>	<b>27</b>	

\*Every student must pass this paper since it is mandatory. However the credits will not included in the

calculation of SGPA and CGPA

  
CHAIRMAN  
Board of Studies in Chemistry  
SATAVAHANA UNIVERSITY  
KARIMNAGAR - 505 001.

**M.Sc. CHEMISTRY SYLLABUS**  
**SEMESTER –II**

(Effective from the academic year 2016-2017 for University and affiliated colleges)

**Paper – II: CH202T (Organic Chemistry-II)**

OC05: Conformational Analysis

OC06: Organo metallic reagents

OC-07: Photochemistry

OC08: Pericyclic reactions

**OC05: Conformational Analysis: (15Hrs)**

Introduction to conformational isomerism, concept of dynamic stereochemistry, study of conformations of ethane, butane and 1,2-di halo butanes, halo hydrins and vicinaldiols Klyne prelog terminology for conformers and torsion angles. Conformations of unsaturated acyclic compounds Factors affecting stability of conformations, use of physical and spectral methods in determining preferred conformations. Conformations relative stability and reactivity of acyclic diastereomers. Steric and stereo electronic factors examples. Conformation and reactivity winstein Holness equation Curtin Hamett Principle. Stereo Chemistry of additions, eliminations, neighboring group participation & intra molecular rearrangements.

**OC06: Organometallic reagents: (15Hrs)**

**A) Preparation and application of the following organo metallic reagents in organic synthesis: 1) i) Grignard, ii) Organo lithium and iii) Organo copper reagents 2) Organo boranes in C-C bond formation 3). Organo silicon reagents: reactions involving  $\beta$ -carbocations and  $\alpha$ -carbanions, utility of trimethyl silyl halides, cyanides and triflates.**

**B) Carbonyl methylenation: a) Phosphorous ylide mediated olefination: 1) Wittig reaction, 2) Horner-Wadsworth Emmons reaction b) Titanium-Carbene mediated olefination: 1) Tebbe reagent, 2) Petasis reagent**

**OC-07: Photochemistry: (15 Hrs)**

Overview of thermal and photo chemical excitations of molecules-Morse curve –Jablonsky diagram-fluorescence and phosphorescence.

**Carbonyl photo chemistry:**  $\alpha$ -Cleavage,  $\gamma$ -hydrogen transfer (Norrish type I and type II reaction). Photo reduction-Paterno-Buchi reaction.

**Photochemistry of olefins:** Cis- trans isomerizations, conjugated olefins-Barton reaction.

Photo chemistry of arenes. Di- $\pi$ -methane rearrangement. Investigation of the mechanism of photochemical reaction- detection of intermediates-sensitization and quenching

### **OC08: Pericyclic reactions:**

**(15 Hrs)**

**Orbital representation of molecular orbitals:** bonding, nonbonding, antibonding orbitals, symmetry properties of molecules.

**Classification of pericyclic reactions:** Electrocyclic reactions, cycloaddition reactions, sigmatropic reactions & examples.

**Aromatic transition state theory:** Concept, Woodward-Hoffmann selection rules for electrocyclic reactions, cycloaddition- cycloreversions and sigmatropic reactions based on ATS aromatic transition state (Huckel-Mobious) approach.

**Frontier molecular orbital theory:** Concept, Woodward- Hoffmann rules for electrocyclic, cycloaddition and sigmatropic reactions based on FMO approach.

**Conservation of molecular orbitals theory:** Concept, framing of Woodward- Hoffmann selection rules for electrocyclic, cycloaddition cycloreversions based on conservation of molecular orbitals approach.

### **References:**

1. Stereochemistry of carbon compounds –Principles and Applications by D.Nasipuri
2. Stereochemistry by V M Potapov
3. Hand book of Grignard reagents by Gray S Silverman & Philip E Rakija
4. Grignard reagents- New developments by Herman G.Richey
5. Basic organometallic Chemistry by B.D Guptha & A J Elias
6. Molecular reactions and photochemistry by Depuy and Chapman
7. Organic photochemistry by N.J.Turro
8. Organic photo chemistry by D Coyle
9. Organic Reaction mechanisms – Mukherji & Singh
10. Pericyclic reactions by Mukherje.
11. Conservation of orbital symmetry by wood ward and Hoffmann