Gyanmanjari Innovative University

Course Syllabus
Gyanmanjari Science Colleges
Semester-1(M.Sc.)

Subject: Organic Chemistry-MSCIN11505

Type of course: Minor

Prerequisite: To provide students the knowledge of general organic chemistry.

Rationale: The Prerequisite provide the foundation for understanding the concepts and principle of fundamental organic chemistry.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks					Total Marks
				Theory Marks		Practical Marks		CA	
CI	T	P	C	ESE	MSE	V	P	ALA	
3	0	0	3	60	30	10	00	50	150

Legends: CI-Class Room Instructions; T – Tutorial; P - Practical; C – Credit; ESE - End Semester Examination; MSE- Mid Semester Examination; V – Viva; CA - Continuous Assessment; ALA- Active Learning Activities.

Continuous Assessment:

Sr. No	Active Learning Activities	Marks
1	**Presentation** Faculty will assign topics and students will prepare presentations (Slideshow/video) and upload them to Moodle.	10
2	**Quiz** Faculty will assign 10 MCQs per unit.	10
3	**Report** Write a report (in 100 words) on a given topic.And upload it to Moodle.	10
4	**Video Survey** Faculty will assign video and students will give the answer according to video and upload to Moodle.	10

5	**Summary report** Faculty will assign one research paper and students will make a summary and upload it to Moodle.	10
Total		**50**

Course Content:

Unit No	Course content	Hrs	% Weightage
1	**Chapter-1 Aromaticity:** • Concept of aromaticity, non-aromaticity and anti-aromaticity • Huckel's rule and its applications to simple and non-benzenoid aromatic compounds, • Cyclopentadiene, azulene, tropolone system, annulenes, hetero annulenes and fullerenes (C60).	15	30
2	**Chapter-2 Aliphatic Nucleophilic Substitution** • Aliphatic Nucleophilic Substitution SN^1, SN^2 and mixed SN^1 and SN^2 mechanism. • The neighbouring group mechanism, neighbouring group participation (by π- and σ bonds). • Anchimeric assistance. • SN1 mechanism- Nucleophilic substitution at an allylic, aliphatic trigonal and vinylic carbon. • Reactivity effects of substrate structure, attacking nucleophilic group, leaving group and reaction medium, ambident nucleophile. **Chapter-3 Aliphatic Electrophilic Substitution** • Bimolecular mechanism- SE^2. • The SE^1 mechanism, electrophilic substitution accompanied by double bond shift. • Effect of substrates, leaving group and the solvent polarity on the reactivity.	15	40

3	**Chapter-4 Aromatic Electrophilic and Nucleophilic Substitution :** • The arenium ion mechanism, orientation and reactivity. • The ortho/para ratio, ipso attack, orientation in other ring systems. • Diazonium coupling, Vilsmeir reaction, Gattermann-Koch reaction. • The SNAr, diazonium salts and benzyne mechanisms. • Reactivity–effect of substrate structure, leaving group and attacking nucleophile. • The von Richter, Sommelet-Hauser and Smiles rearrangements.	15	30

Suggested Specification table with Marks (Theory):60

Distribution of Theory Marks **(Revised Bloom's Taxonomy)**						
Level	Remembrance (R)	Understanding (U)	Application (A)	Analyze (N)	Evaluate (E)	Create (C)
Weightage	35%	25%	30%	10%	-	-

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcome:

After learning the course the students should be able to:	
CO1	Learn the Aromaticity and application of IUPAC.
CO2	Get an idea about the Aliphatic Nucleophilic Substitution and reactions of some important compounds..

CO3	Acquire knowledge on Aromatic Electrophilic Substitution..
CO4	Study basic concept on Rearrangements of various organic and inorganic molecules.
CO5	Solving the problem, critical thinking and analytical reasoning as applied to scientific problems.

Instructional Method:

The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.

From the content 10% topics are suggested for flipped mode instruction.

Students will use supplementary resources such as online videos, NPTEL/SWAYAM videos, e-courses, Virtual Laboratory

The internal evaluation will be done on the basis of Active Learning Assignment

Practical/Viva examination will be conducted at the end of semester for evaluation of performance of students in laboratory.

Reference Books:

1) Organic Chemistry Vol. I & II VIth edition by I. L. Finar ELBS Publication.
2) Advance Organic Chemistry IIIrd edition by J. March, Wiley Eastern Limited.
3) Natural Products Chemistry, Vols. I & II by K. Nakanashi, Academic Press, New York and London.
4) Hetero-cyclic Chemistry IIIrd edition by J. A. Joule, K. Mills, G. F. Smith Chapman &Hall.