GOVERNMENT WOMEN'S COLLEGE SUNDARGARH

CRITERIA 2.6.2 CO-PO ATTAINMENT

Prepared by Dr. Bhanu Priya

Assistant Professor in Chemistry

COURSE NAME: ORGANIC CHEMISTRY 1

SECOND SEMESTER 2023

SYLLABUS

CORE PAPER – III

ORGANIC CHEMISTRY I

Unit –I:

Basics of organic chemistry

Electronic Displacements: Inductive, electromeric, resonance and mesomeric effects, hyperconjugation and their applications; Dipole moment; Organic acids and bases; their relative strength.

Homolytic and heterolytic fission with suitable examples. Curly arrow rules; Electrophiles and Nucleophiles; Nucleophilicity and basicity; Types, shape and relative stability of carbocations, carbanions, free radicals and carbenes.

Introduction to types of organic reactions and their mechanism: Addition, Elimination and Substitution reactions.

Carbon-carbon sigma bonds

Chemistry of alkanes: Formation of alkanes, Wurtz Reaction, Wurtz-Fittig Reactions, Free radical substitutions: Halogenation -relative reactivity and selectivity.

Unit – II:

Stereochemistry

Fischer Projection, Newmann and Sawhorse Projection formulae; Geometrical isomerism: cis–trans and, syn-anti isomerism E/Z notations with C.I.P rules.

Optical Isomerism: Optical Activity, Specific Rotation, Chirality/Asymmetry, Enantiomers, Molecules with one and two chiral-centres, Distereoisomers, meso-structures, Racemic mixture and resolution, inversion. Relative and absolute configuration: D/L and R/S designations.

Unit – III:

Chemistry of aliphatic hydrocarbons

Carbon-Carbon pi bonds:

Formation of alkenes and alkynes by elimination reactions, Mechanism of E1, E2, E1cb reactions. Saytzeff and Hofmann eliminations.

Reactions of alkenes: Electrophilic additions their mechanisms (Markownikoff/ Anti Markownikoff addition), mechanism of oxymercuration-demercuration, hydroboration oxidation, ozonolysis, reduction (catalytic and chemical), syn and anti-hydroxylation (oxidation). 1,2- and 1,4-addition reactions in conjugated dienes and, Diels-Alder reaction; Reactions of alkynes: Acidity, Electrophilic and Nucleophilic additions. Hydration to form carbonyl compounds, Alkylation of terminal alkynes.

Cycloalkanes and Conformational Analysis

Types of cycloalkanes and their relative stability, Baeyer strain theory, Conformational analysis of alkanes (ethane and n-butane): Relative stability with energy diagrams. Energy diagrams of cyclohexane: Chair, Boat and Twist boat forms.

Unit – IV:

Aromatic hydrocarbons

Aromaticity: Hückel's rule, aromatic character of arenes, cyclic carbocations/carbanions and heterocyclic compounds with suitable examples. Electrophilic aromatic substitution: halogenation, nitration, sulphonation and Friedel-Craft's alkylation/acylation with their mechanism. Directing effects of the groups

Recommended Text Books:

1. Morrison, R. N. & Boyd, R. N., Organic Chemistry, Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).
2. Bhal and Bhal, Advanced Organic Chemistry, 2nd Edition, S. Chand Publisher, 2012.
3. Kalsi, P. S., Stereochemistry Conformation and Mechanism; 8thEdn, New Age International, 2015.

Reference Books:

1. Graham Solomons T. W., Fryhle, Craig B., Snyder Scott A, Organic Chemistry, Wiley Student Ed, 11th Edition (2013)
2. Jonathan Clayden, Nick Greeves, Stuart Warren, Organic Chemistry, 2nd Edition, Oxford Publisher, 2014.
3. Dhawan, S.N., Pradeep's Organic Chemistry, (Vol. I and II), Pradeep Publications

NAME OF STAFF	Dr. Bhanu Priya
COURSE NAME	ORGANIC CHEMISTRY
COURSE CODE	CC-3
SEMESTER	2ND SEMESTER
BRANCH	CHEMISTRY
BATCH	2022-2025
ACADEMIC YEAR	2022-23

EVALUATION

7. MARK DISTRIBUTION:

A. Subjects Without Practical :

Mid Semester	End Semester	Total
20	80	100

B. Subjects With Practical :

Mid Semester	End semester		Total
	A-Theory	B-Practical	
15	60	25 (20 + 05 (Record))	100

C. Projects : The mark distribution would be subject specific. In general, the Project report will carry 80 marks and viva voce/Seminar will carry 20 marks. The report marks will be subdivided as : Introduction and context : 10 marks; Literature survey : 10 marks; Actual project work methodology : 20 marks, Results, discussion, critical analysis : 10 marks; Clarity of thought and aesthetics of report : 10 marks

Qualification	Grade	Mark Secured from 100	Grade Point	Classification for Hons.	Classification for Pass
Outstanding	'O'	90-100	10	First Class Hons.	Pass
Excellent	'A+'	80-89	9		
Very Good	'A'	70-79	8		
Good	'B+'	60-69	7		
Above average	'B'	50-59	6	Second Class Hons.	
Fair	'C'	45-49	5		
Pass	'D'	40-44	4		
Fail	'F'	Below 40	0		Fail
Absent	'ABS'	00	0		Fail
Malpractice	'M'	00	0		MP

13.2 Paper with Practical :

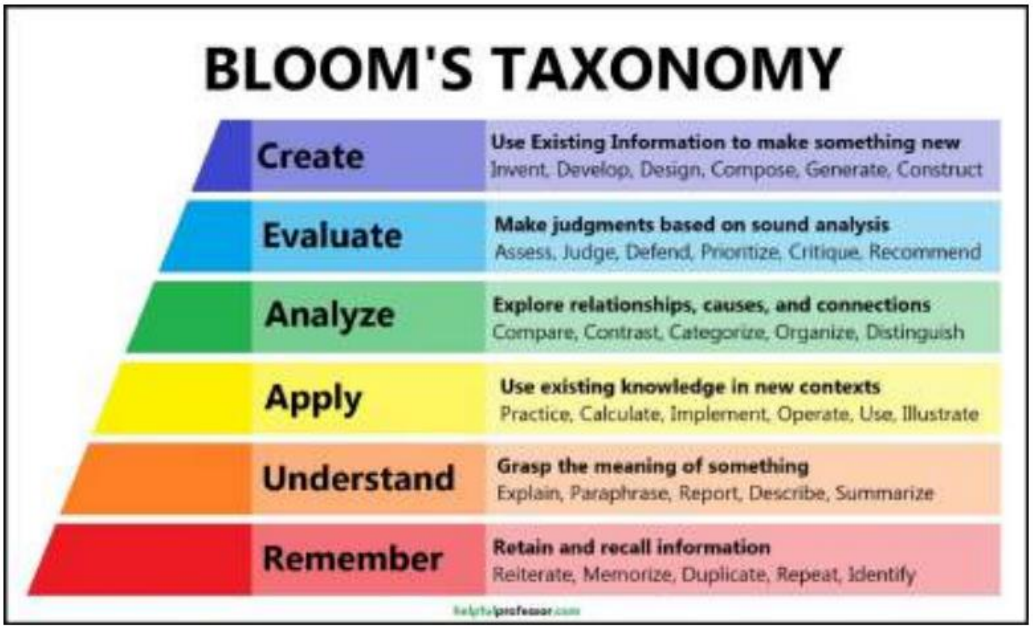
Mid Sem	End Semester				Total	Paper Pass Mark
	A-Theory	Pass Mark A-Theory	B-Practical	Pass Mark B-Practical		
15	60	30% out of 60 (i.e. 18 mark)	25	40% out of 25 (i.e. 10 mark)	100	40 out of 100 By taking (i.e. Mid-Sem + End Sem Exam + Practical)

a. End Semester(University Examinations) : Total Mark: 60, 30% out of Total Mark(i.e. 18 mark)

b. Minimum pass mark for practical paper is 40%.

c. Total Mark: 100 (40% out of 100)

APPROACH TO PEDAGOGY



- Bloom's Taxonomy attempts to classify learning stages from remembering facts to creating new ideas based on the acquired knowledge.
- The idea of Bloom's Taxonomy is that learning is a consecutive process. Before applying a concept in real life, we must understand it. Before we understand a concept, we must remember the key facts related to it.
- Therefore, although initially described as a framework, it is now often depicted as a pyramid.

PROGRAM OUTCOMES OF BSC CHEMISTRY

Undergraduate Programme: B.Sc	
PO1	**Scientific Knowledge**: Acquire a solid foundation in scientific theories, methodologies, and empirical findings across various disciplines.
PO2	**Analytical Thinking**: Develop the ability to critically analyze scientific data, draw accurate conclusions, and apply scientific reasoning to real-world problems.
PO3	**Laboratory Skills**: Gain proficiency in using scientific tools, conducting experiments, and documenting findings.
PO4	**Research Abilities**: Understand the research process and engage in independent or collaborative research projects.
PO5	**Communication**: Effectively communicate scientific information in written, spoken, and visual formats to peers, professionals, and the general public.
PO6	**Ethical Awareness**: Understand and apply ethical considerations in scientific research and practice
PO7	**Continuous Learning**: Stay updated with advancements in scientific knowledge and technology through lifelong learning.

COURSE OUTCOME OF DSC-III PAPER

Semester-II			
C-III	Organic chemistry-I	CO1	Study focused on the basics of organic chemistry, stereochemistry, aliphatic and aromatic hydrocarbons aim to provide students with a fundamental understanding of the structure, properties, and reactions of organic compounds.
		CO2	Understand the concept of isomerism (structural, geometric, and optical) and its significance in organic molecules.
		CO3	Learn the basic types of organic reactions (addition, elimination, substitution) and understand the mechanisms and conditions under which they occur.
		CO4	Introduce reaction mechanisms in organic chemistry (SN1, SN2, E1, E2) and learn the basics of stereochemistry (chirality, enantiomers, diastereomers).
		CO5	Understand the structure and properties of aromatic compounds, and the concept of resonance in organic molecules.

Statement of PSO

Program Specific Outcomes are statements that describe what the graduates of a specific undergraduate program should be able to do.

Name of Progamme : B.Sc Chemistry	
PSO1	**Understanding Fundamental Concepts:** Demonstrate a comprehensive understanding of the core principles in chemistry, including atomic structure, chemical bonding, thermodynamics, kinetics, and quantum mechanics
PSO2	**Laboratory Proficiency:** Proficiently perform laboratory techniques, including titrations, spectrophotometry, chromatography, and other analytical methods, while adhering to safety protocols.
PSO3	**Chemical Knowledge Application:** Apply chemical theories and principles to practical real-world scenarios, such as environmental issues, industrial processes, and pharmaceutical applications
PSO4	**Communication Skills:** Communicate scientific information effectively through written reports, oral presentations, and graphical representations of data, demonstrating the ability to convey complex scientific concepts to diverse audiences
PSO5	**Ethical Practices:** Understand and adhere to ethical standards in conducting research, handling chemicals, and promoting safety measures within the laboratory and the broader community
PSO6	**Research Skills:** Develop basic research skills, including the ability to design experiments, collect, analyze, and interpret data, and draw valid conclusions while considering the limitations and uncertainties in experimentation.
PSO7	**Interdisciplinary Knowledge:** Recognize and appreciate the interdisciplinary nature of chemistry, connecting its principles with other scientific disciplines like biology, physics, and environmental sciences.
PSO8	**Adaptability and Innovation:** Adapt to new technologies and methodologies in the field of chemistry, while demonstrating creativity and innovation in problem-solving and research endeavors.
PSO9	**Critical Analysis:** Apply critical thinking to analyze and solve problems in chemical systems, interpret experimental data, and draw conclusions based on evidence and scientific reasoning

CO-PO MAPPING

GOVERNMENT WOMEN'S COLLEGE SUNDARGARH					
FACULTY NAME :				DR BHANU PRIYA	
BRANCH:	UG PHYSICAL SCIENCE			SESSION:	2022-23
COURSE	CHEMISTRY	YEAR:	1st	SEMESTER:	2ND SMESTER
SUBJECT:	ORGANIC CHEMISTRY 1			SUBJECT CODE	CC 03

COURSE OUTCOMES (CO) MAPPING WITH PROGRAM OUTCOMES (PO) AND PROGRAM SPECIFIC OUTCOMES (PSO)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PS05	PS06	PS07	PSO8	PSO9
CO1	3	2	3	2	1	3	3	3	1	3	1	2	3	1	1	1
CO2	3	2	3	2	1	2	3	1	1	1	1	3	2	1	1	1
CO3	3	3	3	2	1	1	3	1	1	1	1	3	2	1	1	1
CO4	3	1	3	3	1	3	2	3	3	1	1	3	2	1	1	1
CO5	3	2	2	3	2	1	2	3	3	1	1	3	2	1	1	1
Avarage	3.00	2.00	2.80	2.40	1.20	2.00	2.60	2.20	1.80	1.40	1.00	2.80	2.20	1.00	1.00	1.00

3-HIGH (corresponds to a high correlation) 2-MEDIUM (corresponds to a medium correlation) 1-LOW (corresponds to a low correlation) between CO and PO/PSO

Note: The exact number of CO has to be kept (If there are only 3 COs, only CO1, CO2 and CO3 has to be kept, the other COs can be deleted)

MARK DETAILS OF STUDENTS

+3 2nd Semester 2023				
Sl. No.	University Roll No	Name of the student	Internal Exam	End Semester
1	SO6522CHE001	Jyoshna Seul	11	F
2	SO6522CHE002	Sujata Kalo	14	A+
3	SO6522CHE003	Annya Rout	12	F
4	SO6522CHE004	Sanjana Toppo	10	F
5	SO6522CHE005	Manini Barbhuyan	11	F
6	SO6522CHE006	Sneha Bag	13	B
7	SO6522CHE007	Epsita Oram	11	C
8	SO6522CHE008	Jharana Sahu	12	A+
9	SO6522CHE009	Saima Parween	14	O
10	SO6522CHE010	Sandhya Sahoo	12	C
11	SO6522CHE011	Mami Khamari	12	F
12	SO6522CHE012	Susama Mahanand	7	F
13	SO6522CHE014	Pratibha Buda	11	F
14	SO6522CHE015	Padmini Majhi	12	C
15	SO6522CHE016	Namita Lugun	12	C
16	SO6522CHE018	Sruti Patel	10	F

0	90-100
A+	80-89
A	70-79
B+	60-69
B	50-59
C	45-49
D	40-44
F	BELOW 40

CO ATTAINMENT CALCULATION

CO Attainment Calculations											
	Direct attainment								Indirect Assessment	
	Internal						External			
	CIA1		CIA2				ESE		Course Exit Survey	
Number of students who have scored more than the target (P) (Target is 60%)		15		15				8		11
Percentage of students who have achieved the target = (P/N)*100 (N is the number of students who appeared in the exam)	16	93.75	16	93.75			16	50	16	68.75
Attainment Level (3 for >80%, 2 for >70%, 1 for> 60%)	a=	3	b=	3			c=	0	d=	1
Attainment based on internal assessment (CIA) = Average of (a and b);					CIA	=	3			
Direct CO Attainment Level (DA) =40%CIA + 60% End-Term (c) ;					DA	=	1.2			
Indirect CO Attainment Level (IA) (based on Exit Survey (d));					IA	=	1			
					80 % of DA	=	0.96			
					20 % IA	=	0.2			
CO Attainment Level (COA) = 80 % DA+ 20 % IA;					COA	=	1.16			

PO PSO ATTAINMENT CALCULATION

PO Attainment Calculations											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4
Average Mapping (M)	3.00	2.00	2.80	2.40	1.20	2.00	2.60	2.20	1.80	1.40	1.00
PO / PSO Attainment Level	1.16	0.773333	1.082667	0.928	0.464	0.773333	1.005333	0.850667	0.696	0.541333	0.386667