



DEPARTMENT OF CHEMISTRY (UG & PG), JHARGRAM RAJ COLLEGE
LESSON PLAN (SESSION: 2021-2022)

TEACHER: DR. ANSUMAN BEJ (ORGANIC CHEMISTRY)

UG SEMESTER-I

PAPER: CC1T (ORGANIC CHEMISTRY)

PERIOD	TOPIC(S) TO BE COVERED
October 2021	Valence Bond Theory
November 2021	Electronic displacements in covalent bond.
December 2021	<i>MO theory</i> and π -MO of alkene, conjugated diene and triene system.
January 2022	University question practice and Class test

PAPER: DSC1A (FOR GENERAL COURSE)

PERIOD	TOPIC(S) TO BE COVERED
November 2021	Physical Effects, Electronic Displacements
December 2021	Aliphatic Hydrocarbons alkanes and alkenes.
January 2022	Practice sessions

UG SEMESTER-II

PAPER: CC4T (ORGANIC CHEMISTRY)

PERIOD	TOPIC(S) TO BE COVERED
March 2022	Reaction thermodynamics: free energy and equilibrium, enthalpy and entropy factor, calculation of enthalpy change via BDE, intermolecular & intramolecular reactions.
April 2022	Concept of organic acids and bases: effect of structure, substituent and solvent on acidity and basicity; proton sponge; gas-phase acidity and basicity; comparison between nucleophilicity and basicity.
May 2022	Tautomerism: prototropy (keto-enol, nitro - aci-nitro, nitroso-oximino, diazo-amino and enamine-imine systems); valence tautomerism and ring-chain tautomerism; composition of the equilibrium in different systems.

PAPER: CC4P (ORGANIC CHEMISTRY LAB-I)

PERIOD	TOPIC(S) TO BE COVERED
March 2022	PREPARATION OF ORGANIC COMPOUND, NITRATION OF AROMATIC COMPOUNDS, CONDENSATION REACTIONS, ACETYLATION OF PHENOLS/AROMATIC AMINES.
April 2022	ACETYLATION OF PHENOLS/AROMATIC AMINES, SELECTIVE REDUCTION OF <i>M</i> -DINITROBENZENE TO <i>M</i> -NITROANILINE.
May 2022	BROMINATION OF ANILIDES USING GREEN APPROACH (BROMATE-BROMIDE METHOD)

UG SEMESTER-III

PAPER: CC-7T (ORGANIC CHEMISTRY-II), CARBONYL CHEMISTRY (20 Lectures)

PERIOD	TOPIC(S) TO BE COVERED
August 2021	Addition to C=O: structure, reactivity and preparation of carbonyl compounds; mechanism (with evidence), reactivity, equilibrium and kinetic control; Burgi-Dunitz trajectory in nucleophilic additions; formation of hydrates, cyano hydrins and bisulphite.
September 2021	Nucleophilic addition-elimination reactions with alcohols, thiols and nitrogen-



PERIOD	TOPIC(S) TO BE COVERED
	based nucleophiles; reactions: benzoin condensation.
October 2021	Cannizzaro and Tischenko reactions, reactions with ylides: Wittig and Corey-Chaykovsky reaction; Rupe rearrangement.
November 2021	Oxidations and reductions: Clemmensen, Wolff-Kishner, LiAlH_4 , NaBH_4 , MPV, Oppenauer, Bouveault-Blanc, acyloin condensation; oxidation of alcohols with PDC and PCC; periodic acid and lead tetraacetate oxidation of 1,2-diols.

PAPER: CC-7P (ORGANIC CHEMISTRY LAB), FUNCTIONAL GROUP DETECTION– I (20 Lectures)

PERIOD	TOPIC(S) TO BE COVERED
August 2021	Detection of special elements, Solubility and classification.
September 2021	Detection of the following functional groups by systematic chemical tests.
October 2021	Detection of the following functional groups by systematic chemical tests
November 2021	Preparation, purification and melting point determination of a crystalline derivative of the given compound. Identification of the compound through literature survey.

UG SEMESTER-IV

PAPER: CC-10T (ORGANIC CHEMISTRY), FUNCTIONAL GROUP DETECTION– I (20 Lectures)

PERIOD	TOPIC(S) TO BE COVERED
February 2022	Wagner-Meerwein rearrangement, pinacol rearrangement, dienone-phenol; Wolff rearrangement in Arndt-Eistert synthesis, benzil-benzilic acid rearrangement, Demjanov rearrangement, Tiffeneau–Demjanov rearrangement.
March 2022	Rearrangement to electron-deficient centre: rearrangements: Hofmann, Curtius, Lossen, Schmidt and Beckmann, Baeyer-Villiger oxidation, cumene hydroperoxide-phenol rearrangement and Dakin reaction.
April 2022	<i>Migration from oxygen to ring carbon:</i> Fries rearrangement and Claisen rearrangement, Fries rearrangement, Claisen rearrangement, Beckmann rearrangement, Baeyer-Villiger oxidation.
May 2022	<i>Migration from nitrogen to ring carbon:</i> Hofmann-Martius rearrangement, Fischer-Hepp rearrangement, N-azo to C-azo rearrangement, Bamberger rearrangement, Orton rearrangement and benzidine rearrangement.
PERIOD	TOPIC(S) TO BE COVERED
February 2022	Colligative properties: thermodynamic treatment, applications, abnormalities
March 2022	Phase rule: thermodynamic derivation, one- and multi-component systems
April 2022	First order phase transition and Clapeyron equation
May 2022	Binary solutions; Class tests

PAPER: CC-10P (ORGANIC CHEMISTRY LAB), Quantitative Estimations (20 Lectures)

PERIOD	TOPIC(S) TO BE COVERED
February 2022	Estimation of glucose by titration using Fehling's solution, Estimation of sucrose by titration using Fehling's solution,
March 2022	Estimation of vitamin-C, Estimation of aromatic amine (aniline) by bromination (Bromate-Bromide) method, Estimation of phenol by bromination.



PERIOD	TOPIC(S) TO BE COVERED
April 2022	Estimation of urea, Estimation of formaldehyde.

UG SEMESTER-V**PAPER: CC12T (ORGANIC CHEMISTRY): Carbocycles and Heterocyclic compounds (25 Lectures)**

PERIOD	TOPIC(S) TO BE COVERED
July 2021	Polynuclear hydrocarbons and their derivatives, synthetic methods include Haworth, Bardhan-Sengupta, Bogert-Cook and other useful syntheses (with mechanistic details); fixation of double bonds and Fries rule.
August 2021	Property of heterocyclic compound with single heteroatom.
September 2021	Synthesis of some five and six membered heterocyclic compound.
October 2021	Chemical reactions of heterocyclic compounds.

PAPER: CC12T (ORGANIC CHEMISTRY LAB): Spectroscopic Analysis of Organic Compounds (10 Lectures)

PERIOD	TOPIC(S) TO BE COVERED
July 2021	Assignment of labelled peaks in the ^1H NMR spectra of the known organic compounds.
August 2021	Assignment of labelled peaks in the IR spectrum of the same compound explaining the relative frequencies of the absorptions.
September 2021	Analysis of full spectra of some compound.
October 2021	Analysis of full spectra of some compound.
November 2021	Analysis of full spectra of some compound.

UG SEMESTER-VI**PAPER: DSE3T: (GREEN CHEMISTRY): (10 Lectures)**

PERIOD	TOPIC(S) TO BE COVERED
January 2022	Examples of Green Synthesis/ Reactions and some real world cases.
February 2022	Examples of Green Synthesis/ Reactions and some real world cases.
March 2022	Future Trends in Green Chemistry

PAPER: DSE3P: (GREEN CHEMISTRY LAB): (10 Lectures)

PERIOD	TOPIC(S) TO BE COVERED
January 2022	Preparation of biodiesel from vegetable/ waste cooking oil.
February 2022	Photoreduction of benzophenone to benzopinacol in the presence of sunlight.

**PG SEMESTER-I****PAPER: CEM 102 (ORGANIC CHEMISTRY):**

PERIOD	TOPIC(S) TO BE COVERED
October 2021	Unit-1: Pericyclic reaction-1
November 2021	Unit-1: Organic transformations by using pericyclic reaction.
December 2021	Unit-1: Synthesis of organic compound by using pericyclic reaction.

PG SEMESTER-II**PAPER: CEM 202 (ORGANIC CHEMISTRY):**

PERIOD	TOPIC(S) TO BE COVERED
February 2022	Unit-1: Pericyclic reaction-2
March 2022	Unit-2: Reagents chemistry-2

PG SEMESTER-III**PAPER: CEM 302 (ORGANIC CHEMISTRY SPECIALIZATION):**

PERIOD	TOPIC(S) TO BE COVERED
September 2021	Unit-1: Pericyclic Reaction-III
October 2021	Unit-1: Pericyclic Reaction-III
November 2021	Unit-4: Organometallic Chemistry

PAPER: CEM 303 (ORGANIC CHEMISTRY SPECIALIZATION):

PERIOD	TOPIC(S) TO BE COVERED
September 2021	Unit-5: Peptides and Nucleic acids
October 2021	Unit-6: Green Chemistry.

PAPER: CEM 395 (ORGANIC CHEMISTRY SPECIALIZATION):

PERIOD	TOPIC(S) TO BE COVERED
September 2021 – December 2021 (16 weeks)	Review work in an area of transition metal nanoparticle catalysed reaction.

PG SEMESTER-IV**PAPER: CEM 401 Advanced Spectroscopy-II (COMMON PAPER):**

PERIOD	TOPIC(S) TO BE COVERED
February 2022	Unit-1: NMR Spectroscopy I
March 2022	Unit-3: NMR Spectroscopy I

PAPER: CEM 403 (ORGANIC CHEMISTRY SPECIALIZATION):

PERIOD	TOPIC(S) TO BE COVERED
February 2022	Unit-2: Stereochemistry IV
March 2022	Unit-3: Stereochemistry V
April 2022	Unit-4: Stereochemistry VI

PAPER: CEM 495 (ORGANIC CHEMISTRY SPECIALIZATION):

PERIOD	TOPIC(S) TO BE COVERED
February 2022 – May 2022 (16 weeks)	Review work in an area of transition metal nanoparticle annulations reaction of aryl halide and diarylacetylene.