



**PREM CHAND MARKANDA S.D. COLLEGE FOR WOMEN,
JALANDHAR CITY**

Re-accredited 'A+' grade (2nd Cycle) by NAAC Bangalore

A unique prestigious Post Graduate Institution of Northern India

**DEPARTMENT OF CHEMISTRY TEACHING PLAN
(Session 2025-26)**

Program: Bachelor of Science

Program Outcome:	Upon Completion of the Bachelor Programme, the graduates will be able to:
PO.1	After completion of course, student can pursue M.Sc in Chemistry, Physics, Mathematics, IT and Forensic Sciences.
PO.2	Student can get opportunities in higher education and research organizations such as BARC, ONGC, NITs, ISRO etc.
PO.3	Student can work as Medical Representatives.
PO.4	Students will gain in-depth knowledge of fundamental concepts in Physics, Chemistry, Mathematics, and related subjects.
PO.5	This course opens several career options in government and private sectors.

Teaching Plan
Session 2025-26
Even Semester
CLASS: B.Sc Non-MEDICAL Semester 2nd
SUBJECT: ORGANIC CHEMISTRY
Faculty Name: Ms.Muskan Kalra

TOPIC	DURATION	TEACHING TOOLS
Section – A Hybridization, localized and delocalized bonds Reactive Intermediates: Carbocations, Carbanions ,Free Radicals, Carbene, Nitrene Stereochemistry: E/Z notations, CIP rules, Optical Activity, Chirality , Enantiomers and Diastereomers, Racemic mixture and Resolution	January	• Assignments • Chalk and Board • Discussion in Classroom • YouTube videos • Flow charts • Structure hybridization correlation
Optical Activity in absence of chiral carbon Relative and Absolute configuration: D/L and R/S designations Section- B Chemistry of Alkanes : Preparation and Chemical reactions Confirmation analysis and Cycloalkanes : Baeyer Strain Theory , Relative stability and energy diagrams	February	• Assignments • Chalk and Board • Discussion in Classroom • Seminars • Cause effect reasoning

Cyclohexane and Chair, Boat and Twist boat forms of Cyclohexane	March	
Chemistry of Alkenes / Alkynes Nomenclature and formation, Mechanism of E1/E2, Saytzeff & Hoffman elimination, Syn and Anti hydroxylation's, Diels Alder reaction, Mechanism of Allylic and benzylic bromination Reactions of Alkynes	April	• Writing key points • Drawing diagrams • Charts • PPT • Handouts • Reference books • Q/A sessions

Course outcome

CO.1	Students will be able to understand the all basic facts and concepts of Organic Chemistry
CO.2	Students will be able to analyze reaction mechanism and stability of reaction intermediates
CO.3	Students will be able to apply concept of Stereochemistry, Isomerism, Chirality and Optical Activity
CO.4	Evaluation of reactivity and selectivity of Organic Reactions
CO.5	Develop skill to critically analyze Organic Reactions and mechanisms

Teaching Plan
Session 2025-26
Even Semester

CLASS: B.Sc Non-MEDICAL & Computer Sc. Semester- 4th

SUBJECT: INORGANIC CHEMISTRY

Faculty Name: Ms.Muskan Kalra

TOPIC	DURATION	TEACHING TOOLS
Section - A p-block Elements Group 16 General characteristics , Hydrides of group 16 , Chemical properties of SO ₂ , structure of SO ₂ &SO ₃ , Oxoacid of sulphur Preparation of Sulphuric acid by contact process and chemical properties	January	• Flow charts • Mind maps • Discussion in Classroom • Chalk & Duster
Group 17 General characteristics, oxidation state and reactivity , Hydrides of group 17 , Relative acidic strength of hydro acids and Oxoacids of Group 17 ,structure of Interhalogen compounds Important compounds of p-Block Carbides , fluorocarbons, Silicones and phosphazenes, triphosphazenes	February	• Quiz • Assignments • Seminars • Mind maps • PPT
Section-B Chemistry of Transition elements : General characteristics, relatively	March	• Previous knowledge testing • Q/A • Discussions

stability of their oxidation state . General characteristics of Second and third Transition series elements difference in properties and magnetic behaviour		
f- block elements Lanthanoids; Characteristics, Lanthanoid Contraction spectral and magnetic properties Actinoids; Characteristics, and properties, Comparison of Lanthanoids & Actinoids	April	• YouTube videos reference • Notes • Assignments • Real life examples

Course outcome

CO.1	Students will be able to explain electronic configuration, periodic trends and oxidation states of group 16-17
CO.2	Students will be able to compare chemical reactivity, anomalous behaviour and inert pair effect
CO.3	Students will be able to illustrate structures of important p block elements, magnetic behaviour and properties of d & f block elements
CO.4	Students will be able to discuss Lanthanoid Contraction and its consequences
CO.5	Students will be able to analyze complex formation properties of f block elements

Teaching Plan
Session 2025-26
Even Semester
CLASS: B.Sc Non-MEDICAL & Computer Sc. Semester-VI
SUBJECT: ORGANIC CHEMISTRY- IV
Faculty Name: Ms.Muskan Kalra

TOPIC	DURATION	TEACHING TOOLS
Section – A Spectroscopy 1)(NMR) Nuclear Magnetic Spectroscopy, Principles of NMR, Chemical shift, Applications of PMR and interpretation 2) Infrared absorption Spectroscopy introduction and principles of IR Spectroscopy 3)UV absorption Spectroscopy, Beer Lambert Law, Chromophores and Auxochromes , Woodward Fieser rule, application of UV absorption Spectroscopy	January	• Problem based learning • YouTube videos • Chalk and talk
4) Organic synthesis via Enolates Acidity of alpha hydrogens, alkylation of diethyl malonate and ethyl acetoacetate, Claisen Condensation. Alkylation of	February	• Problem based learning • PPTs • Assignments • Seminars

1,3 dithianes, Alkylation and acylation of enamines. 5) Carbohydrates Classification and nomenclature Osazone formation, Chain lengthening and chain shortening, Erythro and threodiastereomers, Mutarotation		
6) Amino acids, Peptides, Proteins and Nucleic Acids Classification, structure and stereochemistry of Amino Acids, Isoelectric point, Preparation and reactions of alpha amino acids, Peptides and Proteins, Levels of Protein structure, protein Denaturation/Renaturation	March	• Chalk and talk • PPTs • Flow charts
7) Nucleic Acids Introduction, Constituents of nucleic acids. Ribonucleosides and Ribonucleotides, Structure of DNA	April	• Seminars • Assignments • YouTube videos

Course outcome

CO.1	Students will be able to understand fundamental principles of spectroscopy and its role in structure determination of organic molecules
CO.2	Students will be able to interpret spectroscopic data
CO.3	Students will be able to explain chemistry and reactivity of enolates
CO.4	Students will be able to describe structure, stereochemistry and reactions of carbohydrates and amino acids
CO.5	Students will be able to correlate chemical properties with biological significance