



# Sh. L. N. Hindu College, Rohtak (Haryana)

## Course Plan

### Department of Chemistry

Program: B.Sc.(Physical Science)

Minor Chemistry (24CHE401MI01)

### SCHEME

<b>Course Name</b>	Minor Chemistry	<b>Course Type</b>	Theory
<b>Course Code</b>	24CHE401MI01	<b>Class</b>	B.Sc(Physical science) 1st sem
<b>Instruction Delivery</b>	Per week Lectures: 2, Tutorial -1, Practical: - Total No. Classes Per Sem: 72(L), 28(T), -(P) Assessment in Weightage: Sessional (20%), End Term Exams (80%)		
<b>Course Coordinator</b>	Mrs. Ritu	<b>Course Instructors</b>	Theory: Mrs. Ritu Practical: --

### COURSE OVERVIEW

Minor chemistry is concerned with the periodic table & periodic properties, atomic structure, mole concept & Fundamental of organic chemistry.

### PREREQUISITE

Basics of chemistry, Knowledge of periodic table, atoms & molecules, mole concept, organic chemistry basic concepts.

### COURSE OBJECTIVE

The objective of this course is to explore the knowledge of periodic table & atomic structure. This course will also provide us knowledge of fundamentals of organic chemistry.

### COURSE OUTCOMES (COs)

After the completion of the course, the student will be able to:

CO No.	Course Outcomes
1	Remember the basic concept of atomic structure.
2	Understand the Chemistry of periodic table & atomic properties. .
3	Apply the various concepts of mole concept.
4	Analyze the application of fundamentals of organic chemistry.



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### COURSE

### CONTENT

Content
Atomic structure:- atomic models,Rutherford Model and its limitations,Bohr model and its applications, dual nature of matter and light, De broglies relationship, Hisenberg uncertainty principle, concept of orbitals ,Quantum numbers ,shape of s,p, d orbitals ,rule for filling electron in orbitals- Aufbau principal, Pauli's exclusion principle and Hunds rule, electronic configuration of atoms ,stability of half filled and completely filled orbitals .Periodic table and atomic properties:- brief history of the development of periodic table, Modern Periodic table and the present form of periodic table, periodic trend in properties of element -atomic radii, ionic radii ,inert gas radii, ionization enthalpy ,electron gain enthalpy, electronegativity, valency, nomenclature of elements with atomic number greater than hundred.Mole concept -atomic mass, Mole concept and molar mass ,Avogadros no. & its significance ,percentage composition ,empirical and molecular formula, chemical reactions, Ways of expressing concentration of solutions (molarity ,normality, molality ,mole percentage, strength) Stoichiometric involving reactants and products. Fundamentals of organic chemistry -electronic displacement ,inductive effect, resonance, hyperconjugation cleavage of bonds, reaction intermediate -Carbo cations ,carbon anions, free radicals and carbenes,electrophiles and nucleophiles, aromaticity:Benzenoids & Huckels rule.

### LESSON PLAN (THEORY AND TUTORIAL CLASSES)

L. No	Topic to be Delivered	Tutorial Plan	Unit
1	Brief history of the development of periodic table		1
2	Modern periodic law		
3	Present form of periodic table		
4	Periodic trends in properties of elements- atomic radii ,ionic radii and inert gas radii		
5	Ionization energy, electron gain enthalpy and valency		



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6	Nomenclature of elements with atomic number greater than 100, electronegativity	Discussion of previous year questions	
7	Atomic models, Rutherford Model and its limitations		2
8	Bohr models and its applications		
9	Dual nature of matter and light, de Broglie relationship & Heisenberg uncertainty principle		
10	Concept of orbitals, Quantum numbers, shape of s, p, d orbital		
11	Rules for filling electrons in orbitals - Aufbau principle, Pauli exclusion principle and Hund's rule	Practice questions on quantum numbers	3
12	Electronic configuration of atoms, stability of half filled and completely filled orbitals		
13	Atomic mass, mole concept and molar mass		
14	Avogadro's number and its significance, percentage composition, empirical and molecular formula		
15	Molality, molarity, Normality, mole percentage, strength		
16	Stoichiometric calculation involving reactant and products		
17	Electronic displacement, inductive effect		
18	Resonance and hyperconjugation	Practice of Normality, molarity numericals	4
19	Cleavage of bonds, reaction intermediate- carbocations		
20	Carbanions, free radicals and carbenes		
21	Electrophiles and nucleophiles, Aromaticity		
22	Benzenoids & Huckel's rule		

23	Revision of syllabus	Discussion of previous year questions paper	
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24	Revision of syllabus		
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### Text Book

Modern inorganic chemistry by R. D madan.

Organic chemistry by I. L. Finar

### Reference Books

- "Basic organic chemistry by R. chandra, S. Singh and A. Singh"
- "A textbook inorganic chemistry by O.P.Tandon".

### Web/Links for e-content

- [https://youtu.be/ny3u\\_-Tiggo?si=\\_VqrZzfb8aDDH-Uq](https://youtu.be/ny3u_-Tiggo?si=_VqrZzfb8aDDH-Uq)  
<https://youtu.be/3JibRsWm2wc?si=1xu3IZhnbXgHokLg>
- <https://youtu.be/GneRsMnp4w?si=aSW1YjN6O4Tvb4hm>

### PRACTICE QUESTIONS (QUESTION BANK)

S No	Problem
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1	What is the difference between electron gain enthalpy and ionization energy?
2	Explain details of modern periodic table.
3	Explain atomic radii, ionic radii and inert gas radii.
4	What do you mean by Heisenberg Uncertainty Principle?
5	Explain De-broglie relationship.
6	Give rules for filling electron in orbitals.
7	What is the difference between molarity and molality?
8	Discuss about inductive effect and electromeric effect.
9	What do you mean by electrophiles and nucleophiles?
10	Explain huckle rule.
11	Explain Carbo cations and carbon anions.
12	What is the significance of Avogadro's number?



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