

**KURUKSHETRA UNIVERSITY**

**KURUKSHETRA**

(Established by the state legislature Act XII of 1964)  
A<sup>+</sup> Grade NAAC Accredited)



**REVISED**

**Scheme of Examination and Syllabus for  
Under-Graduate Programme**

**Subject: Chemistry Minor Paper i.e. CC-M2,  
B-23 CHE-203**

**Under Multiple Entry-Exit, Internship and  
CBCS-LOCF in accordance to NEP-2020  
w.e.f. 2023-24**

**DEPARTMENT OF CHEMISTRY, KURUKSHETRA UNIVERSITY, KURUKSHETRA**

FIRST YEAR: SEMESTER-1									
Remarks	Course	Paper(s)	Nomenclature of Paper	Credits	Hours/Week	Internal marks	External Marks	Total Marks	Exam Duration
Scheme A & C	CC-1	B-23 CHE-101	Chemistry-I	3	3	20	50	70	3 hrs.
	MCC-1		Practical	1	2	10	20	30	3 hrs.
Scheme C only	MCC-2 4 credit	B-23 CHE-102	Physical Chemistry-I	3	3	20	50	70	3 hrs.
			Practical	1	2	10	20	30	3 hrs.
Scheme A & D	CC-M1 2 credit	B-23 CHE-103	Minor Chemistry-I	1	1	10	20	30	2 hr
			Practical	1	2	05	15	20	2 hrs
Scheme A, C & D	MDC-1 3 credits	B-23 CHE-104	Introductory Chemistry-I	2	2	15	35	50	3 hrs.
			Practical	1	2	5	20	25	3 hrs.
Scheme C only	CC-M1 4 credit	From Available CC-I/MCC-I of 4 credits as per NEP							
FIRST YEAR: SEMESTER-2									
Remarks	Course	Paper(s)	Nomenclature of Paper	Credits	Hours/Week	Internal marks	External Marks	Total Marks	Exam Duration
Scheme A & C	CC-2	B-23 CHE-201	Chemistry-II	3	3	20	50	70	3 hrs.
	MCC-3 4 credit		Practical	1	2	10	20	30	3 hrs.
Scheme C only	DSEC-1 4 credit	B-23 CHE-202	Chemistry Skill-I	3	3	20	50	70	3 hrs.
			Practical	1	2	10	20	30	3 hrs.
Scheme A & D	CC-M2		Minor Chemistry-II	1	1	10	20	30	2 h

	2 credit	B-23 CHE- 203	Practical	1	2	05	15	20	2 hrs
Scheme A, C & D	MDC-2  3 credits	B-23 CHE- 204	Introductory Chemistry-II	2	2	15	35	50	3 hrs.
			Practical	1	2	5	20	25	3 hrs.
Scheme C only	CC-M2  4 credit	From Available CC-2/MCC-3 of 4 credits as per NEP							
<b>Internship of 4 credits of 4-6 weeks duration after 2<sup>nd</sup> Semester</b>									

**CC-M2**

<b>Session: 2023-24</b>			
<b>Part A - Introduction</b>			
Subject	Chemistry		
Semester	II		
Name of the Course	<b>Minor Chemistry-II</b>		
Course Code	B23-CHE-203		
Course Type: (CC/MCC/MDC/CC- M/DSEC/VOC/DSE/PC/AEC/VA C)	CC-M		
Level of the course (As per Annexure-I)	100-199		
Pre-requisite for the course (if any)	4.0		
Course Learning Outcomes(CLO):	After completing this course, the learner will be able to: <ol style="list-style-type: none"> <li>1. To know the basics of periodic properties and hybridization.</li> <li>2. To learn about the ionic solids.</li> <li>3. Understand about the semiconductors and metallic bonds.</li> <li>4. Get the knowledge of stereochemistry of simple organic molecules.</li> </ol> <hr style="width: 20%; margin-left: 0;"/> 5*. Hand on practice in preparation of solutions, compounds, estimation and determination of physical properties of some compounds.		
Credits	<b>Theory</b>	<b>Practical</b>	<b>Total</b>
	<b>1</b>	<b>1</b>	<b>2</b>
Contact Hours	<b>15</b>	<b>30</b>	<b>45</b>
<b>Max. Marks:30 + 20*</b>		<b>Time:02 + 02* hrs</b>	
<b>Internal Assessment Marks:10 + 05*</b>			
<b>End Term Exam Marks: 20 + 15*</b>			

## Part B- Contents of the Course

### Instructions for Paper- Setter

**Note:** The examiner is requested to set nine questions in all, selecting two questions from each SECTION and one question (Question No.1 based on entire syllabus will consist of short answer type. All questions carry equal marks. The candidate is required to attempt five questions in all selecting one from each SECTION. Question No.1 is compulsory. Log table and non-programmable calculator is allowed.

Unit	Topics	Contact Hours
I	<b>Periodic table and atomic properties</b> Atomic properties: atomic and ionic radii, ionisation energy, electron affinity and electronegativity definition, trend in periodic table, effective nuclear charge, Slater's rules.	4
II	<b>Ionic Solids:</b> Stoichiometric and Non-stoichiometric defects in crystals, Lattice energy and Born- Haber cycle, Solvation energy and its relationship with solubility of Ionic solids, Polarizing power and Polarisability of ions, Fajan's rule.	4
III	<b>Structure and Bonding in Organic Compounds</b> Localized and delocalized chemical bond, Van der Waal's interactions, resonance: conditions and resonance effect, hyperconjugation, inductive effect, Electromeric effect & their comparison.	4
IV	<b>Gaseous State</b> Kinetic theory of gases, Calculation of root mean square velocity, average velocity, and most probable velocity. Collision diameter, collision number, collision frequency and mean free path (derivations excluded).	3
V*	1. Acid/Base titration: Determination of strength of oxalic acid using NaOH. 2. Redox titrations: Determination of Fe <sup>2+</sup> ions using KMnO <sub>4</sub> . 3. To determine the surface tension of given liquid using stalagmometer by drop no. method. 4. To prepare a sample of iodoform.	30
<b>Suggested Evaluation Methods</b>		

<p><b>Internal Assessment: 10 + 05*</b></p> <p>➤ <b>Theory</b></p> <ul style="list-style-type: none"> <li>• Class Participation: 3</li> <li>• Seminar/presentation/assignment/quiz/class test etc.: 3</li> <li>• Mid-Term Exam: 4</li> </ul> <p>➤ <b>Practicum</b></p> <ul style="list-style-type: none"> <li>• Class Participation: NA</li> <li>• Seminar/Demonstration/Viva-voce/Lab records etc.: 05*</li> <li>• Mid-Term Exam: NA</li> </ul>	<p><b>End Term Examination:</b></p> <p><b>20 + 15*</b></p>
<p><b>Part C-Learning Resources</b></p>	
<p><b>Recommended Books/e-resources/LMS:</b></p> <ol style="list-style-type: none"> <li>1. Huheey, J.E.; Keiter, E.A.; Keiter; R. L.; Medhi, O.K. (2009), <b>Inorganic Chemistry- Principles of Structure and Reactivity</b>, Pearson ducation.</li> <li>3. Atkins, P.W.; Paula, J.de. (2014), <b>Atkin’s Physical Chemistry Ed.</b>, 10<sup>th</sup> Edition, Oxford UniversityPress.</li> <li>4. Kapoor, K.L.(2015), <b>A Textbook of Physical Chemistry</b>, Vol 1, 6<sup>th</sup> Edition, McGraw HillEducation.</li> <li>5. Khosla, B.D.; Garg, V.C.; Gulati, A. (2015), <b>Senior Practical Physical Chemistry</b>, R. Chand &amp;Co, New Delhi.</li> </ol>	

\*Applicable for courses having practical component.