


## Dyal Singh College, Karnal

Name of the Programme: MASTER OF SCIENCE (M.Sc. CHEMISTRY)

Duration: Two Years

Programme Outcomes (POs) for PG courses of Faculty of M.Sc. CHEMISTRY		
PO1	Knowledge	Capable to apply the full scale and thorough knowledge in social practices gained during the course of study.
PO2	Communication	Competency in communicating with effective scientific aptitude in context of chemistry on general and scientific topics with society.
PO3	Problem Solving	Proficiency in critical thinking and solving general and scientific problems by applying the knowledge gained during the course of study. Implementing qualitative as well as quantitative analytical synthetic and phenomenon-based problems in chemical sciences.
PO4	Individual and Team Work	Capability to learn and work as an individual and also as a team in the course of multidisciplinary options.
PO5	Investigation of Problems	Capable of analysing the different aspects of a problem, designing of experiments, analysing and interpreting the data to reach a conclusion.
PO6	Modern Tool Usage	Capability to learn and use modern skills, tools and technologies for social and scientific practices and acquired the knowledge of spectroscopy that is used significantly in medical fields like MRI and X-Rays.
PO7	Science and Society	Capable to assess different kinds of social issues by applying reasoning and scientific aptitude developed during the course. Knowledge of medicines, foods, fertilizers and many more can be applied for the welfare of society.
PO8	Life-Long Learning	Developed Learning attitude for newer skills and activities throughout their life.
PO9	Environment and Sustainability	Capable to use the acquired knowledge to design new ideas and systems that are helpful for environment and its sustainability like green chemistry.
PO10	Ethics	Able to apply different ethics and principles, avoid unethical behaviour such as fabrication of data, committing plagiarism and unbiased truthful actions in all aspects different professional and social practices
PO11	Project Management	Competency to handle and manage projects with comprehensive theoretical as well as practical knowledge and understanding of diverse scientific principles.

<b>Programme Specific Outcomes (PSOs) for Chemistry subject of M.Sc. Chemistry</b>	
The aim of the curriculum designed for MSc course is to cultivate the technical aptitude of students for professional skills in the area of Chemical industries/ Research programmes.	
<b>PSO1</b>	Knowledge of chemistry plays an important role in the area of Fertilizer industry, Food adulteration and Fats/Oil industries..
<b>PSO2</b>	Will become recognizable with the various branches of chemistry such as analytical, physical, organic, inorganic, environmental and polymer.
<b>PSO3</b>	Teaching of this subject will inculcate the ability in youth to synthesize the medicines in pharmaceutical industry.
<b>PSO4</b>	Knowledge of spectroscopy plays significant role in the medical applications such as MRI and X-Rays.
<b>PSO5</b>	The programme of mathematics for chemists will develop knowledge in area integration of any spectrographs and graphs drawing/analysis.

  
 Principal  
 Dyal Singh College  
 KARNAL



**M. Sc. Previous (1st Semester) CHEMISTRY****Course Outcomes of Paper-I Inorganic Chemistry (General)****Course Objectives:**

CHEM-M-I.1	Describe advanced symmetry concepts of chemical molecules and the great orthogonality theorem with their applications. To identify the axis, plane, centre, point group, polarity, dipole moment and product of symmetry operations and character tables of chemical compounds.
CHEM-M-I.2	To describe VSEPR theory and Walsh diagrams. Energy of hybridisation. Huckel theory for simple molecules. To discuss the substitution reactions of covalently bonded molecules boron, silicon and nitrogen.
CHEM-M-I.3	To know about the metal equilibria in solutions. To describe the factors affecting stability of metal ligand complexes. Using various methods for the determination of stability constant.
CHEM-M-I.4	To determine the various methods for the determination of stability constant and apply the concept of molecular orbital theory to tetrahedral square planar and octahedral complexes.

CHEM-M stands for CHEMISTRY M.Sc.

**Mapping of CO with PO's**

Cos#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CHEM-M-I.1	3	3	3	3	3	3	3	3	2	2	3
CHEM-M-I.2	3	3	3	3	2	3	3	2	3	3	3
CHEM-M-I.3	3	3	3	3	3	3	3	3	3	2	3
CHEM-M-I.4	3	3	3	3	3	2	3	2	2	3	3
Average	3	3	3	3	2.75	2.75	3	2.5	2.5	2.5	3

**Mapping of CO with PSO's**

Cos#	PSO1	PSO2	PSO3	PSO4	PSO5
CHEM-M-I.1	2	3	3	3	3
CHEM-M-I.2	3	3	3	3	3
CHEM-M-I.3	3	3	3	3	2
CHEM-M-I.4	2	3	3	3	3
Average	2.5	3	3	3	2.75

**M. Sc. Previous (Ist Semester) CHEMISTRY**

**Course Outcomes of Paper-II Physical Chemistry (General)**

**Course Objectives:**

CHEM-M-II.1	Recapitulation of thermodynamic laws, concept of fugacity and its determination. Concept of activity and its determination using emf measurement, vapour pressure method and some other methods, partial molar quantities, chemical potential for ideal gases and mixture of gases, Gibbs-Duhem equation, concept of escaping tendency and chemical potential.
CHEM-M-II.2	To explain Collision theory of reaction rates, steric requirements, Arrhenius equation and activated complex theory (ACT) and to demonstrate the thermodynamic formulations of activated complex theory. To describe the concept of potential energy surfaces and Lindemann-Christiansen and Hinshelwood mechanisms of unimolecular reactions.
CHEM-M-II.3	To discuss Debye-Hückel theory of ion-ion interaction and activity coefficient, its applicability, limitations and its modification for finite-sized ions, effect of ion-solvent interaction on activity coefficient. To derive D-H-O equation - its applicability and limitations, Pair-wise association of ions (Bjerrum treatment) and its modifications for ion-pair formation. To know the Concept of electrical double layer and its structure. To know about Helmholtz-Perrin, Gouy-Chapman, and Stern models, electrokinetic phenomena and the determination of zeta potential.
CHEM-M-II.4	To discuss the Langmuir adsorption isotherm and its kinetic derivation for non-dissociative and dissociative adsorption. To know about surface catalyzed unimolecular and bimolecular reactions, temporary and permanent catalytic poisons. To carry out a comparison between homogeneous and heterogeneous reaction rates.

CHEM-M stands for CHEMISTRY M.Sc.

**Mapping of CO with PO's**

Cos#	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CHEM-M-II.1	3	3	3	3	3	3	3	3	2	2	3
CHEM-M-II.2	3	3	3	3	3	3	3	2	3	3	2
CHEM-M-II.3	3	3	2	3	3	3	3	3	3	2	3
CHEM-M-II.4	3	3	3	3	3	2	3	2	2	3	3
Average	3	3	2.75	3	3	2.75	3	2.5	2.5	2.5	2.75

**Mapping of CO with PSO's**

Cos#	PSO1	PSO2	PSO3	PSO4	PSO5
CHEM-M-II.1	2	2	3	3	3
CHEM-M-II.2	3	3	3	3	3
CHEM-M-II.3	3	3	3	3	2
CHEM-M-II.4	2	3	3	3	3
Average	2.5	2.75	3	3	2.75