FACULTY OF SCIENCE

Mohanlal Sukhadia University, Udaipur

M.Sc. Chemistry (CBCS) Programme

(Valid from session 2018-19 onwards)

1. Duration of the Course

The Master of Science Chemistry programme will be of four semesters duration under Choice based Credit system which will be conducted in two years. Each semester will be of approximately 5 months (minimum 90 working days in a semester) duration.

2. Eligibility:

Candidates seeking admission to the first semester of M.Sc. (CBCS) Chemistry must have a B.Sc. with Chemistry as one of the optional subjects or as a honor's subject (10+2+3 scheme) with minimum 48% marks from a UGC recognized University

3. **Admissions**:

Admissions to the first semester of M.Sc. (Chemistry) will be made as per admission rules for M.Sc. (CBCS)

4. Medium of Instruction

The medium of instruction and examination shall be English.

5. **No. of Seats**

Total number of normal fee seats: As per information bulletin

6. Curriculum

6.1 M.Sc. (Chemistry) programme has a two year, four semester prescribed course structure which in general terms is known as curriculum. It prescribes courses to be studied in each semester as given below

6.2 M.Sc. (Chemistry) programme shall have a curriculum and course contents (syllabi) for the courses recommended by the committee courses in Chemistry and approved by the academic council of the university.

The programme shall follow Choice Based Credit System(CBCS) and will be governed by the Common Rules and Regulations of Masters programme under CBCS approved by the Academic Council of the University

A. Courses of Study and Examination (2018-19)

List of courses

Core Courses: Theory

Course Code	Title of Course
M1CHE 01-CT01	Inorganic Chemistry_I
M1CHE 02-CT02	Organic Chemistry-I
M1CHE 03-CT03	Physical Chemistry_I
M1CHE 04-CT04	Group Theory and Spectroscopy
M2CHE 01-CT05	Inorganic Chemistry-II
M2CHE 02-CT06	Organic Chemistry-II
M2CHE 03-CT07	Physical Chemistry-II
M2CHE 04-CT08	Environmental and Green chemistry
M3CHE 01-CT09	Advanced Spectroscopic Techniques
M3CHE 02-CT10	Bioinorganic, Bioorganic and Biophysical Chemistry
M4CHE 01-CT11	Special methods of analysis
M4CHE 02-CT12	Photochemistry and Supramolecules

Core Courses: Practical

Course Code	Title of Course
M 1CHE 05-CP01	PR-I: Organic Chemistry
M 1CHE 06-CP02	PR-II: Inorganic and Physical Chemistry
M 2CHE05-CP03	PR-III: Inorganic Chemistry
M 2CHE06-CP04	PR-IV: Organic and Physical Chemistry

M3CHE05-CP05	PR-V: Inorganic Chemistry and spectral problems
M4CHE05- CP06	PR-VI: Polymer synthesis and extraction of natural products

Discipline Specific Courses: Theory and Practical

Subject code	Title of course
Inorganic chemistry discipline (Group A)	
Theory	

M3CHE03-ET01A	Coordination chemistry
M3CHE04-ET02A	Advanced Bio-Inorganic Chemistry
M4CHE03-ET03A	Organometallic chemistry
M4CHE04-ET04A	Inorganic polymers
Practical	
M3CHE06- EP01A	Inorganic Chemistry Practical-I
M4CHE06- EP02A	Inorganic Chemistry Practical-II
Organic chemistry discipline (Group B)	
Theory	
M3CHE03-ET01 B	Modern interfaces of organic chemistry
M3CHE04-ET02 B	Chemistry of heterocyclic compounds
M4CHE03-ET03 B	Medicinal chemistry
M4CHE04-ET04 B	Chemistry of natural products
Practical	
M3CHE06- EP01 B	Organic Chemistry Practical-I
M4CHE06- EP02 B	Organic Chemistry Practical-II
Physical chemistry discipline (Group C)	
Theory	
M3CHE03-ET01C	Chemical kinetics
M3CHE04-ET02C	Nuclear and radiochemistry
M4CHE03-ET03C	Advanced photochemistry and radiation Chemistry
M4CHE04-ET04C	Solid state chemistry
Practical	
M3CHE06- EP01C	Physical Chemistry Practical-I
M4CHE06- EP02C	Physical Chemistry Practical-II
Analytical Chemistry Discipline (Group D)	
Theory	
M3CHE03-ET01D	Fundamentals of analytical chemistry
M3CHE04-ET02D	Modern analytical methods
M4CHE03-ET03D	Analytical techniques
M4CHE04-ET04D	Applied analytical methods

Practical	
M3CHE06- EP01D	Analytical Chemistry Practical-I
M4CHE06- EP02D	Analytical Chemistry Practical-II
Skill Based Courses	
CHE-SP01	Green methods in chemistry
CHE-SP02	Basic analytical chemistry
CHE-SP03	Basics in pharmaceutical chemistry

Course Code

Course codes are written in the following format

Masters programme (M)+Semester (1,2,34)+CHE (Chemistry Discipline)+Serial Number of Course in the Semester(01,02,03 etc)+ hyphen(—-—) +Course type [Core Theory (CT), Core Practical(CP), Discipline Specific Theory (ET), Discipline Specific Practical (EP), Skill Practical(SP)]+Group Code (A,B,C etc)

For example the Course code M1CHE 01-CT01 should read as Master Programme First Semester Chemistry First Course-Core Theory Course-01

In the Course code M3CHE06- EP01A should read as Master Programme Third Semester Chemistry Sixth Course-Discipline Specific Elective Practical Course-01 Group-A

Note: -

1. Skill based courses will be offered on payment basis. Fees will be decided by the concern department as per rules.

2. Candidate has to select two papers from any group A/B/C/D in the III semester, the selected group will continue in the IV semester. Group D courses are available only at Vidhya Bhawan Rural Institute and Government College, Chittorgarh.

3. Practical examinations will be conducted by the board of examiners consisting of one internal (to be appointed by the Head of Department) and one external examiner (to be appointed by the University).

THE COURSES OF STUDY

M.Sc. CHEMISTRY (2018-2019)

Semester I

S. No.	Course code	Title of the course	L-T-P	No. of credits	Max. marks 100		
					Uni. Exam	Int. exam	Total
1	M1CHE 01-CT01	Inorganic Chemistry-I	3-1-0	4	80	20	100
2	M1CHE 02-CT02	Organic Chemistry-I	3-1-0	4	80	20	100
3	M1CHE 03-CT03	Physical Chemistry-I	3-1-0	4	80	20	100
4	M1CHE 04-CT04	Group Theory and Spectroscopy	3-1-0	4	80	20	100
5	M1CHE 05-CP01	Core practical-I	0-0-8	4	80	20	100
6	M1CHE 06-CP02	Core practical-II	0-0-8	4	80	20	100
7	M2CHE07-SP01	Skill Course- I	1-0-3	2	80	20	100
		Total		26	560	140	700

Semester II

S. No.	Course code	Title of the course	L-T-P	No. of Credits	Max. marks 100		
					Uni. Exam	Int. exam	Total
1	M2CHE01-CT05	Inorganic Chemistry-II	3-1-0	4	80	20	100
2	M2CHE02-CT06	Organic Chemistry-II	3-1-0	4	80	20	100
3	M2CHE03-CT07	Physical Chemistry-II	3-1-0	4	80	20	100
4	M2CHE04-CT08	Environmental and Green Chemistry	3-1-0	4	80	20	100
5	M2CHE05-CP03	PR-III: Inorganic Chemistry	0-0-8	4	80	20	100
6	M2CHE06-CP04	PR-IV: Organic and Physical Chemistry	0-0-8	4	80	20	100

		Total		24	480	120	600

Semester III

S. No.	**Course code**	**Title of the course**	**L-T-P**	**No. of credits**	**Max. marks 100**		
					Uni. Exam	Int. exam	Total
1	M3CHE01-CT09	Advanced Spectroscopic Techniques	3-1-0	4	80	20	100
2	M3CHE02-CT10	Bioinorganic, Bioorganic and Biophysical Chemistry	3-1-0	4	80	20	100
3	M3CHE03-ET01X X = A/B/C/D	Discipline Specific Elective- I	3-1-0	4	80	20	100
4	M3CHE04-ET02X X=A/B	Discipline Specific Elective- II	3-1-0	4	80	20	100

	/C /D						
5	M3CHE05-CP05	PR-V:Inorganic Chemistry and spectral problems	0-0-8	4	80	20	100
6	M3CHE06-EP01X= A/B/ C/ D	Discipline Specific Practical- I	0-0-8	4	80	20	100
7	M4CHE07-SP02	Skill Course-II	1-0-3	2	80	20	100
		Total		26	560	140	700

Semester IV

S.	**Course**	**Title of the**	**L-T-**	**No. of**	**Max. mark**

No.	code	course	P	Credits	s 100			
					Uni. Exam	Int. exam	Total	
1	M4CHE01-CT11	Special methods of Analysis	3-1-0	4	80	20	100	
2	M4CHE02-CT12	Photochemistry and Supramolecules	3-1-0	4	80	20	100	
3	M4CHE03-ET03X X=A/B/C /D	Discipline Specific Elective-III	3-1-0	4	80	20	100	
4	M4CHE04-ET04X X=A/B/C /D	Discipline Specific Elective-IV	3-1-0	4	80	20	100	
5	M4CHE05- CP06	PR-VI:Polymer Synthesis and Extraction of Natural Products	0-0-8	4	80	20	100	
6	M4CHE06-EP02X X=A/ B /C /D	Discipline Specific Practical- II	0-0-8	4	80	20	100	
		Total		24	480	120	600	

Credits for all four semesters	100
No. of Core Course Credits	72
No. of Discipline Specific Course Credits	24
No.of Credits for SGPA and CGPA calculation	96
No. of Skill course credits	04

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Syllabus

SEMESTER I
M 1 CHE 01-CT01
Inorganic chemistry

Time: 3 Hrs. **M.M. 80 marks (External)**
20 marks (Internal)
Credits = 4

UNIT-I

Stereochemistry and Bonding in Main Group Compounds, VSEPR Theory, Walsh diagrams (tri and penta-atomic molecules), dπ-pπ bonds, Bent rule and enegretics of hybridization, some simple reactions of covalently bonded molecules

Metal-Ligand Bonding: Limitation of crystal field theory, molecular orbital theory, octahedral, tetrahedral and square planar complexes, π-bonding and molecular orbital theory.

UNIT-II

Metal-Ligand Equilibria in Solution: Stepwise and overall formation constants and their interaction, trends in stepwise constants, factors affecting the stability of metal complexes with reference to the nature of metal ion and ligand, chelate effect and its thermodynamic origin, determination of binary formation constants by pH-metry and spectrophotometry