DEPARTMENT OF POLYMER SCIENCE

University College of Science
MOHANLAL SUKHADIA UNIVERSITY, UDAIPUR–313 009

MASTER OF SCIENCE IN POYMER SCIENCE (SEMESTER SCHEM)
(Effective from Session 2011-12)

1. **Duration of the Course:** The Master of Science (Polymer Science) course will be of four semester duration to be conducted in two tears. Each semester will be of approximately five month (minimum 90 working days in a semester) duration

2. **Eligibility:** Candidates seeking admission to the first semester of Master of Science Polymer Science must have a B.Sc. or equivalent degree with Chemistry as one of the optional subject/honors' subject.

3. **Admission**
   Admission will be made on the basis of the fifty present weight age to total theory marks obtained at the graduation level (Total marks of graduation excluding practical marks) Reservation as per university rules will be made.

4. Seats: 10 seats + 10 Self Finance. Total 20 seats.

5. Course Structure

Semester-I

Paper No.	Paper Code	Paper Name	No.of lecturer/ practical	Max. Marks		
				Ext.	Int.	Total
Paper-1		Inorganic Chemistry	04	75	25	100
Paper-2		Organic Chemistry	04	75	25	100
Paper-3		Physical Chemistry	04	75	25	100
Paper-4		Polymer Science-I	04	75	25	100
Paper-5 A		Practical-A	09	75	25	100
Paper-5 B		Practical- B	09	75	25	100
Total			34	450	150	600

Semester-II

Paper No.	Paper Code	Paper Name	No.of lecturer/	Max. Marks		
				Ext.	Int.	Total

			practical			
Paper-1		Instrumental Technique for chemical analysis	4	75	25	100
Paper-2		Specialty Polymer	4	75	25	100
Paper-3		Bio Polymer	4	75	25	100
Paper-4		Polymer Science-II	4	75	25	100
Paper-5 A		Practical-A	09	75	25	100
Paper-5 B		Practical- B	09	75	25	100
		Total	34	450	150	600

Semester-III

Paper No.	Paper Code	Paper Name	No.of lecturer/ practical	Max. Marks		
				Ext.	Int.	Total
Paper-1		Material Science	4	75	25	100
Paper-2		Polymer processing technology	4	75	25	100
Paper-3		Polymer and environment	4	75	25	100
Paper-4		Polymer Science-III	4	75	25	100
Paper-5 A		Practical-A	09	75	25	100
Paper-5 B		Practical- B	09	75	25	100
		Total	34	450	150	600

Semester-IV

Paper No.	Paper Code	Paper Name	No.of lecturer/ practical	Max. Marks		
				Ext.	Int.	Total
Paper-1		Polymer Processing Management	4	75	25	100
Paper-2		Polymer Product Technology	4	75	25	100
Paper-3		Polymer Testing and Characterization	4	75	25	100
Paper-4		Project work and industrial training	-	100	-	100
Paper-5 A		Practical-A	09	75	25	100
Paper-5 B		Practical- B	09	75	25	100
		Total	30	475	125	600

6 Scheme of instruction:

6.1 Theory: Class room instructions as per lecture schedule announced at the beginning of the course.

6.2 Tutorials: A teacher will conduct tutorials in a paper which shall be conducted in the form of interactive class room teaching for following:

(i) To give class room instructions on topics already covered in lectures but students require detailed explanation/examples

(ii) Working out problems, program, demonstration etc. to make students understand the topics.

6.3 Practical: Students are required to work for the specified practical hours to carry out practical experiments, assignments, projects etc. Tutorials in the practical class can be conducted through seminars /workshops/demonstrations.

6.4 Seminar: Students are required to give one seminar in each semester (10 to 15 minutes) using Audio visual aids. They will be required to submit detailed written work on the seminar topic. Seminars can be conducted as a part of tutorials allotted to the practical. Each teacher giving instructions to the students will be giving atleast one lecture each in each semester to provide latest developments, techniques etc. Attendance in all the seminars of all other students is compulsory. Marks proportionate to their absence will be deducted from seminar component of the internal marks.

6.5 Assignments: Teachers will give regular assignments to the students to assess in the topics. Students will be required to complete the same within the stipulated period

7. ATTENDANCE:

Regular attendance of the student is an important factor in the semester system. University rules regarding implementation of attendance for semester courses will follow.

8. Examination scheme:

8.1 University shall conduct examinations only after completion of instructions as per course structure of each semester.

8.2 Each theory paper shall be of 100 marks (75 marks for written examination of 3-hrs duration and 25 marks for internal assessment

8.3 Each practical paper shall be of 100 or 200 marks depending the number of practical in a semester. (75 marks/150 marks for external examination and 25/50 marks for internal marks)

8.4 Syllabus of each paper shall be divided into five units.

8.5. The question paper shall consist total six questions. Part-A shall consist of one compulsory question of 10 marks with ten parts covering the entire syllabus for which answer must be provided within 20 words for each. Part-B will consist five long answer questions (which requires answers in about 500 words for each), one from each unit with internal choice. Each question in the part-B will carry 13 marks each.

8.6 The Internal marks will be awarded by the teacher concerned and will be put for consideration of a committee consisting of Head of the Department, Teacher concerned and Senior teacher of the Department. The committee will ensure that norms given for internal evaluations are followed in the award of internal marks for each theory & practical paper. Detailed breakup of the internal marks along with attendance of the candidate must be submitted to the university.

8.7 To ensure that questions are put within the scope of the course, following materials must be sent to examiners to set question papers

(a) Prescribed syllabus of the paper

(b) Detailed lecture schedule (Minimum 40 Lectures) giving the chapter/section of the text books & Reference book.

(c) Model Question paper

9. Internal evaluation scheme to award internal marks

9.1 Assignments: 40% of the internal assessment marks for each theory paper will be awarded on the basis of the performance in the assignments regularly given to the students.

9.2 Internal examination: 40% of the total internal assessment marks for each theory paper will be awarded on the basis of the performance in the written examination conducted by the faculty, one at the end of the two months and another at the end of the semester.

9.3 Viva /Oral examination: 20% of the total internal assessment marks for each paper will be awarded on the basis of the performance in the Internal viva examination. At least one Internal Viva Voce examination per paper will be conducted by a committee consisting of local examiners preferably during internal examination.

9.4 Students are required to keep record of the assignments, Seminars and answer books of the internal examinations and present them at the end of the semester to the advisory board of the course. The attendance / Lab log book and performance sheet of the student can be examined by the board .The internal marks awarded by the teacher will be moderated by the advisory board if necessary.

9.5 If a student has undertaken project work but failed to submit Project report before the prescribed date for submission, he/she shall be declared failed in IV semester. However he/she will be allowed to submit the same whenever next Semester examination is conducted and internal marks will be carried over.

10. Minimum passing marks and criteria for promotion to next higher semester

10.1 The minimum marks for passing a semester shall be 36% in each paper and 40% marks in the aggregate.

10.2 A candidate may be promoted to the next semester if he or she has secured at least 36% marks in each papers but has failed to secure 40% marks in aggregate. He/she shall be required appear in one or more of the papers of the papers as and when these papers are offered again by the university so as to satisfy the passing criteria laid in 10.1. However, candidate will not be allowed to reappear in the practical papers to improve the percentage.

10.3 A candidate may be promoted to the next semester if he/she has secured at least 36% marks in three papers prescribed in the first semester, provided that aggregate of marks in all papers together is at least 40%. Such candidate shall be required to appear in papers in which he/she has secured less than 36% marks when these courses are offered again so as to satisfy the passing criteria laid in 10.1

10.4 A candidate fails to satisfy the criteria 10.1, 10.2, and 10.3 for promotion to next higher semester shall be required to rejoin the semester in which he/she has failed to satisfy the above criteria, if otherwise eligible in accordance with the university regulations laid in this regard.

10.5 In case result of a semester is not declared by the university, before the starting of the next higher semester, the students who have appeared in all the papers in the semester will be allowed to attend the class of the next higher semester at their own risk. Candidates who are not eligible to be promoted to the next higher semester will have to leave that semester.

11. RESULT

At the end of final examination the candidate's eligible for the award of M.Sc. Degree (Semester Scheme) in the subject concerned. Degree shall be classified on the basis of the marks obtained in the first, second, third and fourth semester examination taken together, as follows:

(a) First Division

60% or more of aggregate marks of all semesters

(b) Second Division

48% or more but less than 60% of aggregate of all semesters

(c) Third Division

40% or more but less than 48% of aggregate marks of all semesters.

A candidate must pass the M Sc examination within four years of the initial admission to the first semester of the course

SEMESTER-I

1. Inorganic chemistry

Time: 3 Hrs. M.M. 75 marks

Note: The paper will be divided into two sections.

Section-A M.C.Q.45 (9 from each section) **Total-45 marks**

Section-B Five question are from each unit with internal choice will be asked and the candidate is required to attempt Three question

Total-30 marks

Unit I

Role of bulk and trace metal ions in biological systems: micronutrients, active transport of Na,K,Mg,and Ca ions across the biological membranes ,elements of bioenergetics with special reference to elements of high energy phosphate bond.

Chlorophylls and their role in photosynthesis.

Unit II

Metalloenzymes: General discussion of enzymes, function of metal ions, vitamin B_{12} and B_{13} coenzymes.

Unit III

Nitrogen fixation: its mechanism, nitrogenase, dinitrogen complexes.

Cytochromes and ferrodoxins, Ionophores.

Unit IV

Molecular orbital treatment of structure of hydrogen molecule and hydrogen molecule ion,Molecular orbital of homo nuclear and hetero nuclear diatomic molecules, correlation diagrams, Self consistent field equation and molecular orbital energies.

MO theory of polyatomic molecules of the type: AX_2, AX_3, AX_4, AX_5, AX_6.

Crystal field theory of coordination compounds : details of crystal field theory for weak and strong field complexes, comparison of VBT and CFT theories ,Measurement of 10Dq and factor affecting it, Thermodynamic aspect of crystal fields, John – Teller effect , complexes of non cubic symmetry.

Unit V

Acids and bases: Hard and Soft Acids and Base and their application.

Protonic Solvents: Sulphuric acid

Aprotic Solvents: Dimethyl Sulphoxides,Bromine trifluride

Mechanism of solvation and solvolytion reactions

Coordination model for non aqueous solvent behavior

Recommended Books:

1. Inorganic chemistry: Puri, Sharma, Kalia