

**DEPARTMENT OF CHEMISTRY
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE**

Program Code : **XXX M.Sc. (Chemistry)**
 Department : **Department of Chemistry**
 Year : **I**
 Model : **1-A**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	CYC-501	Quantum Chemistry, Symmetry and Group Theory	PCC	4	3	1	0	3	0
2.	CYC-503	Thermodynamics, Interfaces and Solids	PCC	3	3	0	0	3	0
3.	CYC-505	Advanced Analytical Methods	PCC	3	3	0	0	3	0
4.	CYC-507	Structure and Reactivity of Organic Molecules	PCC	3	3	0	0	3	0
5.	CYC-509	Coordination Chemistry	PCC	3	3	0	0	3	0
6.	CYC-511	Organic Chemistry Laboratory	PCC	3	0	0	6	0	6
7.		Social Science Course	SSC	2	-	-	-	-	-
		Total		21					
Semester-II (Spring)									
1.	CYC-502	Advanced Organometallic Chemistry	PPI	3	3	0	0	3	0
2.	CYC-504	Kinetics and Photochemistry	PPI	3	3	0	0	3	0
3.	CYC-506	Organic Reaction Mechanisms	PPI	3	3	0	0	3	0
4.	CYC-508	Molecular Spectroscopy	PPI	3	2	0	2	3	0
5.	CYC-510	Inorganic Chemistry Laboratory	PPI	3	0	0	6	0	6
6.		Science, Technology, and Advanced Research-tools	STAR	3	-	-	-	-	-
7.	CYC-700	Seminar	SEM	2	-	-	-	-	-
		Total		20					

**DEPARTMENT OF CHEMISTRY
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE**

Program Code : **XXX M.Sc. (Chemistry)**
 Department : **Department of Chemistry**
 Year : **II**
 Model : **1-A**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
Semester-I (Autumn)									
1.	CYC-691	Internship Social Activity	ISA	3	-	-	-	-	-
2.	CYC-513	Physical Chemistry Laboratory	PPI	3	0	0	6	0	6
3.		Program Elective-I	PPI	3	-	-	-	-	-
4.		Program Elective-II	PPI	3	-	-	-	-	-
5.		Program Elective-III	PPI	3	-	-	-	-	-
6.		Program Elective-IV	PPI	3	-	-	-	-	-
7.	CYC-601	Project-I	PROJECT	2	0	0	4	0	0
Total				20					
Semester-II (Spring)									
1.		Program Elective-V	PEC	3	-	-	-	-	-
2.		Program Elective-VI	PEC	3	-	-	-	-	-
3.	CYC-602	Project-II	PROJECT	10	0	0	20	0	0
Total				16					

Summary				
Semester	1	2	3	4
Semester-wise Total Credits	21	20	20	16
Total Credits	77			

M.Sc. (Chemistry)

Program Elective Courses

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	CYL-501	Chemistry of Main Group and Transition Metals	PEC	3	3	0	0	3	0
2.	CYL-502	Drug Design and Synthesis	PEC	3	3	0	0	3	0
3.	CYL-512	Nuclear and Radiochemistry	PEC	3	3	0	0	3	0
4.	CYL-518	Structure, Bonding and Properties of Solids	PEC	3	3	0	0	3	0
5.	CYL-520	Inorganic Rings and Polymers	PEC	3	3	0	0	3	0
6.	CYL-522	Synthesis and Properties of Materials	PEC	3	3	0	0	3	0
7.	CYL-606	Total Synthesis	PEC	3	3	0	0	3	0
8.	CYL-607	Electroanalytical Chemistry	PEC	3	3	0	0	3	0
9.	CYL-608	Chemical Biology	PEC	3	3	0	0	3	0
10.	CYL-609	Inorganic Biochemistry and Reaction Mechanism	PEC	3	3	0	0	3	0
11.	CYL-610	Molecular Modelling and Simulations	PEC	3	2	0	2	2	0
12.	CYL-612	Carbon Nanomaterials and their Applications	PEC	3	3	0	0	3	0
13.	CYL-613	Frontiers in Inorganic Biochemistry	PEC	3	3	0	0	3	0
14.	CYL-614	Asymmetric Synthesis	PEC	3	3	0	0	3	0
15.	CYL-615	Crystal and Molecular Structure	PEC	3	2	0	2	2	0
16.	CYL-617	Supramolecular Chemistry	PEC	3	3	0	0	3	0
17.	CYL-621	Organic Structure Determination	PEC	3	3	0	0	3	0
18.	CYL-623	Organic Semiconductors	PEC	3	3	0	0	3	0
19.	CYL-625	Proteins and Polypeptides	PEC	3	3	0	0	3	0
20.	CYL-627	Solid State Chemistry and Applications	PEC	3	3	0	0	3	0
21.	CYL-629	Advanced Topics in Statistical Mechanics, and Quantum Chemistry	PEC	3	3	0	0	3	0
22.	CYL-633	Nanoscale Materials: Properties and Applications	PEC	3	3	0	0	3	0
23.	CYL-635	Advanced Magnetic Resonance Spectroscopy	PEC	3	3	0	0	3	0

M.Sc. (Chemistry)

Program Elective Courses

24.	CYL-638	Reactivity, Structure Determination, Devices and Electronic Structure of Solids	PEC	3	2	0	2	3	0
25.	CYL-640	Organic Materials	PEC	3	2	0	2	3	0
26.	CYL-642	Computational Methods in Material Science	PEC	3	2	0	2	3	0
27.	CYL-644	High Energy Density Materials	PEC	3	3	0	0	3	0
28.	CYL-646	Fluorescence and Ultrafast Spectroscopy	PEC	3	3	0	0	3	0
29.	CYL-648	Synthesis and Applications of Tetrapyrroles	PEC	3	3	0	0	3	0
30.	CYL-703	Advanced Material Characterization Techniques	PEC	4	3	1	0	3	0
31.	CYL-902	Advanced Inorganic Chemistry	PEC	3	3	0	0	3	0
32.	CYL-903	Advanced Organic Chemistry	PEC	3	3	0	0	3	0
33.	CYL-904	Advanced Physical Chemistry	PEC	3	3	0	0	3	0
34.	CYL-905	Spectroscopic Methods of Structural Elucidation	PEC	4	3	1	0	3	0

Science, Technology, and Advanced Research-tools Basket

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	CYT-501	Computational Approaches to Catalysis & Reaction Design	STAR	3	2	0	2	3	0
2.	CYT-502	Materials Chemistry: Synthesis and Application	STAR	3	2	0	2	3	0
3.	CYT-503	Advanced Instrumentation Techniques in Scientific Research	STAR	3	2	0	2	3	0