

BIRLA INSTITUTE OF TECHNOLOGY- MESRA, RANCHI
NEW COURSE STRUCTURE- To be effective from academic session 2018-19
Based on CBCS & OBE model for IMSc Chemistry

Semester of Study (Recommended)	Level	Category of course	Course Code	Courses	Mode of Delivery & Credits L-Lecture; T-Tutorial; P-Practicals			Total Credits C- Credits
					L (Periods /week)	T (Periods /week)	P (Periods/ week)	C
FIRST	1	THEORY						
		PC	CH103	Inorganic Chemistry-I; Atomic Structure & Chemical Bonding-I	3	1	0	4
		PC	CH 104	Physical Chemistry-I; States of Matter & Ionic Equilibrium	3	1	0	4
		FS Foundation sciences	PH109	Physics I	3	1	0	4
		HSS	MT123	Business Communications	2	0	2	3
		LABORATORIES						
		PC	CH 105	Inorganic Chemistry-I Lab	0	0	3	2
		PC	CH 106	Physical Chemistry-I Lab	0	0	3	1.5
		FS	PH110	Physics-I Lab	0	0	3	1.5
		MC Mandatory Course	MC 101/102/103/104	Choice of: NCC/NSS/ PT & Games/Creative Arts (CA)	0	0	2	1
TOTAL							21	
SECOND	1	THEORY						
		PC	CH107	Physical Chemistry-II; Chemical Thermodynamics & its Applications	3	1	0	4
		PC	CH108	Organic Chemistry-I	3	1	0	4
		FS	MA108	Mathematics- III	3	1	0	4
		GE	CS270	Fundamental of Computers	3	0	0	3
		LABORATORIES						
		PC	CH109	Physical Chemistry-II Lab	0	0	3	1.5
		PC	CH110	Organic Chemistry-I Lab	0	0	3	1.5
		GE	CS271	Fundamental of Computer Lab	0	0	3	1.5
		MC	MC105/106/107/108	Choice of: NCC/NSS/ PT & Games/Creative Arts (CA)	0	0	2	1
TOTAL							20.5	
GRAND TOTAL FOR FIRST YEAR							41.5	
THIRD	2	THEORY						
		PC	CH201	Inorganic Chemistry-II; s and p-Block Elements	3	1	0	4
		PC	CH202	Physical Chemistry-III; Phase Equilibria & Chemical Kinetics	3	1	0	4
		PC	CH203	Organic Chemistry-II; Oxygen Containing Functional Groups	3	1	0	4
		FS	PH111	Physics –II	3	1	0	4
		HSS	OE	(Open Elective)	3	0	0	3
		LABORATORIES						
		PC	CH204	Inorganic Chemistry-II Lab	0	0	3	1.5
		PC	CH205	Physical Chemistry-III Lab	0	0	4	2
		PC	CH206	Organic Chemistry-II Lab	0	0	3	1.5
FS	PH112	Physics II Lab	0	0	3	1.5		
MC	MC201/202/203/204	Choice of: NCC/NSS/ PT & Games/Creative Arts (CA)	0	0	2	1		
TOTAL							26.5	

THEORY								
FOURTH	2	PC	CH207	Inorganic Chemistry-III; Coordination Chemistry	3	1	0	4
		PC	CH208	Physical Chemistry-IV; Electrochemistry	3	1	0	4
		PC	CH209	Organic Chemistry-III, Heterocyclic Chemistry	3	1	0	4
		FS	MA207	Mathematics IV	3	1	0	4
	1	FS	CE101	Env. Science	2	0	0	2
	LABORATORIES							
	2	PC	CH210	Inorganic Chemistry-III Lab	0	0	4	2
		PC	CH211	Physical Chemistry-IV Lab	0	0	3	1.5
		PC	CH212	Organic Chemistry-III Lab	0	0	3	1.5
		MC	MC205/ 206/207 /208	Choice of: NCC/NSS/ PT & Games/ Creative Arts (CA)	0	0	2	1
TOTAL								24
GRAND TOTAL FOR SECOND YEAR								50.5
THEORY								
FIFTH	3	PC	CH301	Physical Chemistry-V; Quantum Chemistry & Spectroscopy	3	1	0	4
		PC	CH302	Organic Chemistry-IV; Biomolecules	3	1	0	4
		PE	CH(303/ 304)	PE I (Annexure-1)	3	1	0	4
		PE	CH(305/ 306)	PE II (Annexure-1)	3	1	0	4
		FS	MA301	Probability and Statistics	3	1	0	4
	LABORATORIES							
	3	PC	CH307	Physical Chemistry-V Lab	0	0	3	1.5
		PC	CH308	Organic Chemistry-IV Lab	0	0	3	1.5
		PE	CH309/ CH310	PE I-LAB (Annexure-1)	0	0	4	2
		PE	CH311/ CH312	PE II-LAB (Annexure-1)	0	0	4	2
TOTAL								27
THEORY								
SIXTH	3	PC	CH313	Inorganic Chemistry-IV; Organometallic Chemistry	3	1	0	4
		PC	CH314	Organic Chemistry-V; Spectroscopy	3	1	0	4
		PE	CH(315/ 316)	PE III (Annexure-1)	3	1	0	4
		PE	CH(317/ 318)	PE IV (Annexure-1)	3	1	0	4
	LABORATORIES							
	3	PC	CH319	Inorganic Chemistry-IV Lab	0	0	3	1.5
			CH320	Organic Chemistry-V Lab	0	0	3	1.5
		PE	CH (321/32 2)	PE III-LAB(Annexure-1)	0	0	4	2
		PE	CH (323/32 4)	PE IV-LAB(Annexure-1)	0	0	4	2
		PC	CH325	B.Sc. Project Work				4
TOTAL								27
GRAND TOTAL FOR THIRD YEAR								54
GRAND TOTAL FOR B.Sc. (HONOURS) CHEMISTRY								146
NOTE: The Exit option with B.Sc. (Chemistry as Major) can be offered to the student who wants to get it after successful completion of 6th semester.								

SEVENTH	THEORY							
	4	PC	CH401	Basic Inorganic Chemistry	3	1	0	4
			CH402	Chemical Kinetics & Surface Chemistry	3	0	0	3
			CH403	Reactions Mechanism in Organic Chemistry	3	0	0	3
			CH404	Organometallic Chemistry	3	0	0	3
			CH405	Principles of Organic Synthesis	3	1	0	4
		OE		OPEN ELECTIVE-I	3	0	0	3
	2	HSS	MT204	Constitution of India	2	0	0	0
	LABORATORIES							
	4	PC	CH406	Physical Chemistry-VI Lab	0	0	4	2
CH407			Organic Chemistry-VI Lab	0	0	4	2	
TOTAL								
24								
EIGHTH	THEORY							
	4	PC	CH408	Advanced Inorganic Chemistry	3	0	0	3
			CH409	Quantum Chemistry & Group Theory	3	1	0	4
			CH410	Modern Organic Chemistry	3	0	0	3
			CH411	Equilibrium, Non-Equilibrium & Statistical Thermodynamics	3	0	0	3
			CH412	Analytical Chemistry	3	1	0	4
		OE		OPEN ELECTIVE-II	3	0	0	3
	LABORATORIES							
	4	PC	CH413	Inorganic Chemistry-V Lab	0	0	4	2
		PC	CH 414	Theoretical & Computational Chemistry Lab	0	0	4	2
TOTAL								
24								
GRAND TOTAL FOR FOURTH YEAR								
48								
NINTH	THEORY							
	5	PC	CH501	Spectroscopic Elucidation of Molecular Structure	3	1	0	4
		PE	CH502/503/504	PE-V (Inorganic/Physical/Organic) (Annexure-1)	3	1	0	4
		PE	CH 505/506 /507	PE-VI (Inorganic/Physical/Organic) (Annexure-1)	3	1	0	4
	LABORATORIES							
	5	PC	CH508	Advanced Characterization Lab	0	0	4	2
		PE	CH509/510/511	PE Lab (Inorganic/Physical/Organic)(Annexure-1)	0	0	4	2
RP		CH500	Research Dissertation Part I	0	0	4	4	
TOTAL								
20								
TENTH	THEORY							
	5	PE	CH513/514/515	PE-VII (Inorganic/Physical/Organic)(Annexure-1)	3	1	0	4
		RP	CH550	Research Dissertation Part II	0	0	8	8
	TOTAL							
12								
GRAND TOTAL FOR FIFTH YEAR								
32								
GRAND TOTAL (B.Sc.) [IMSc Semester I to Semester VI]								
146								
GRAND TOTAL (M.Sc.) [IMSc Sem VII to Sem-X /or M.Sc Sem I to Sem IV]								
80								
GRAND TOTAL (Integrated M.Sc.)								
226								

PROGRAM ELECTIVE (PE) ANNEXURE-1

LEVEL		Code No.	Name of the Courses	Prerequisites	L	T	P	C
PE-I	3	CH303	Analytical Methods in Chemistry	Intermediate level chemistry	3	1	0	4
		CH304	Industrial Chemical & Environment	Intermediate level chemistry	3	1	0	4
PE-II	3	CH305	Inorganic Materials of Industrial Importance	Intermediate level chemistry	3	1	0	4
		CH306	Molecular Modeling & Drug Design	Intermediate level chemistry	3	1	0	4
		CH309	Analytical Methods in Chemistry Lab	Intermediate level chemistry	0	0	4	2
		CH310	Industrial Chemical & Environment Lab	Intermediate level chemistry	0	0	4	2
		CH311	Inorganic Materials of Industrial Importance Lab	Intermediate level chemistry	0	0	4	2
		CH312	Molecular Modeling & Drug Design Lab	Intermediate level chemistry	0	0	4	2
PE-III	3	CH315	Research Methodology for Chemistry	Intermediate level chemistry	3	1	0	4
		CH316	Novel Inorganic Solids	Intermediate level chemistry	3	1	0	4
		CH317	Polymer Chemistry	Intermediate level chemistry	3	1	0	4
		CH318	Instrumental Methods of Chemical Analysis	Intermediate level chemistry	3	1	0	4
PE – III&IV Lab	3	CH321	Research Methodology for Chemistry Lab	Intermediate level chemistry	0	0	4	2
		CH322	Novel Inorganic Solids Lab	Intermediate level chemistry	0	0	4	2
		CH323	Polymer Chemistry Lab	Intermediate level chemistry	0	0	4	2
		CH324	Instrumental Methods of Chemical Analysis Lab	Intermediate level chemistry	0	0	4	2
PE-V	5	CH502	Solid State & Nuclear Chemistry	B.Sc. Chemistry	3	1	0	4
		CH503	Molecular Spectroscopy	B.Sc. Chemistry	3	1	0	4
		CH504	Advanced Organic Synthesis	B.Sc. Chemistry	3	1	0	4
PE-VI	5	CH505	Bioinorganic Chemistry	B.Sc. Chemistry	3	1	0	4
		CH506	Advanced Electrochemistry	B.Sc. Chemistry	3	1	0	4
		CH507	Selected Topics in Organic Synthesis	B.Sc. Chemistry	3	1	0	4
		CH509	Special Lab(Inorganic)	B.Sc. Chemistry	0	0	4	2
		CH510	Special Lab(Physical)	B.Sc. Chemistry	0	0	4	2
		CH511	Special Lab(Organic)	B.Sc. Chemistry	0	0	4	2
		CH513	Inorganic Photochemistry	B.Sc. Chemistry	3	1	0	4
PE-VII	5	CH514	Chemical Application of Group Theory	B.Sc. Chemistry	3	1	0	4
		CH515	Interdisciplinary Organic Chemistry	B.Sc. Chemistry	3	1	0	4