



**Rashtrasant Tukadoji Maharaj Nagpur University,
Nagpur 440033**

**Scheme and Syllabus
Bachelor of Science (Chemistry)**

**Submitted by
Board of Studies,
Bachelor of Science (Chemistry)**

FYUGP-Scheme I-VIII Semester
Bachelor of Science (Honors/Research)
(Chemistry - Major)
Four Year (Eight Semester Degree Course)
Teaching and Examination Scheme
B.Sc. Sem-I (Chemistry - Major)

S N	Course Category	Name of Course	Course Code	Teaching Scheme (hrs.)			Total Credit	Examination Scheme								
				(Th)	TU	P		Theory				Practical				
								Exa m Hrs.	SEE	CIE	Mi n.	SEE	CIE	Mi n.		
1	DSC	Inorganic Chemistry-1 (Atomic structure, bonding and main group elements)	BCH1T01	2	-	-	2	3	80	20	40	-	-	-		
2	DSC	Inorganic Chemistry-1 (Atomic structure, bonding and main group elements)	BCH1P01	-	-	2	1	-	-	-	-	25	25	25		
3	DSC	Organic Chemistry-1 (Fundamentals, stereochemistry and hydrocarbons)	BCH1T02	2	-	-	2	3	80	20	40	-	-	-		
4	DSC	Organic Chemistry-1 (Fundamentals, stereochemistry and hydrocarbons)	BCH1P02	-	-	2	1	-	-	-	-	-	50	25		
5	GE/OE	Refer GE/OE Basket	BGO1T01	2	-	-	2	3	80	20	40	-	-	-		
6	GE/OE	Refer GE/OE Basket	BGO1T02	2	-	-	2	3	80	20	40	-	-	-		
7	VSC	Soap, detergent and disinfectant Technology	BVS1P01	-	-	4	2	-	-	-	-	50	50	50		
8	SEC	Refer SEC Basket	BVS1P02	-	-	4	2	-	-	-	-	50	50	50		
9	AEC	English Compulsory	BAE1T01	2	-	-	2	3	50	50	40	-	-	-		
10	VEC	Environmental Sci.	BVE1T01	2	-	-	2	3	80	20	40	-	-	-		
11	IKS	Vedic Mathematics	BIK1T01	2	-	-	2	3	80	20	40	-	-	-		
12	CC	Refer CC Basket	BCC1P01	-	-	4	2	-	-	-	-	-	100	50		
Total				14	-	16	22		530	170		125	275			

B.Sc. Sem-II (Chemistry - Major)

S N	Course Category	Name of Course	Course Code	Teaching Scheme (hrs.)			Total Credit	Examination Scheme						
				(Th)	TU	P		Theory				Practical		
								Exa m Hrs.	SEE	CIE	Mi n.	SEE	CIE	Mi n.
1	DSC	Organic Chemistry-2 (Functional group chemistry)	BCH2T03	2	-	-	2	3	80	20	40	-	-	-
2	DSC	Organic Chemistry-2 (Functional group chemistry)	BCH2P03			2	1	-	-	-	-	25	25	25
3	DSC	Physical Chemistry-1 (Thermodynamics, gaseous and liquid states)	BCH2T04	2	-	-	2	3	80	20	40	-	-	-
4	DSC	Physical Chemistry-1 (Thermodynamics, gaseous and liquid states)	BCH2P04			2	1	-	-	-	-	-	50	25
5	GE/OE	Refer GE/OE Basket	BGO2T03	2	-	-	2	3	80	20	40	-	-	-
6	GE/OE	Refer GE/OE Basket	BGO2T04	2	-	-	2	3	80	20	40	-	-	-
7	VSC	Drug synthesis and analysis	BVS2P03	-	-	4	2	-	-	-	-	50	50	50
8	SEC	Refer SEC Basket	BVS2P04	-	-	4	2	-	-	-	-	50	50	50
9	AEC	Second Language	BAE2T02	2	-	-	2	3	50	50	40	-	-	-
10	VEC	Constitution of India	BVE2T02	2	-	-	2	3	80	20	40	-	-	-
11	IKS	Indian Astronomy	BIK2T02	2	-	-	2	3	80	20	40	-	-	-
12	CC	Refer CC Basket	BCC2P02	-	-	4	2	-	-	-	-	-	100	50
Total				14	-	16	22		530	170		125	275	

Exit option: Award of UG Certificate in Major with 40-44 credits and an additional 4 credits core NSQF course/ Internship OR Continue with Major and Minor

B.Sc. Sem-III (Chemistry - Major)

S N	Course Category	Name of Course	Course Code	Teaching Scheme (hrs.)			Total Credit	Examination Scheme						
				(Th)	TU	P		Theory				Practical		
								Exa m Hrs.	SEE	CIE	Mi n.	SEE	CIE	Mi n.
1	DSC	Physical Chemistry-2 (Surface chemistry, phase equilibria, electrochemistry and kinetics)	BCH3T05	2	-	-	2	3	80	20	40	-	-	-
2	DSC	Physical Chemistry-2 (Surface chemistry, phase equilibria, electrochemistry and kinetics)	BCH3P05	-	-	2	1	-	-	-	-	25	25	25
3	DSC	Inorganic Chemistry-2 (Bonding, transition elements and solutions)	BCH3T06	2	-	-	2	3	80	20	40	-	-	-
4	DSC	Inorganic Chemistry-2 (Bonding, transition elements and solutions)	BCH3P06	-	-	2	1	-	-	-	-	-	50	25
5	Minor	Minor 1 (Refer Minor Basket)		2	-	-	2	3	80	20	40	-	-	-
6	Minor	Minor 1 (Refer Minor Basket)		-	-	2	1	-	-	-	-	25	25	25
7	Minor	Minor 2 (Refer Minor Basket)		2	-	-	2	3	80	20	40	-	-	-
8	Minor	Minor 2 (Refer Minor Basket)		-	-	2	1	-	-	-	-	-	50	25
9	GE/OE	Refer GE/OE Basket	BGO3T05	2	-	-	2	3	80	20	40	-	-	-
10	VSC	Refer VSC Basket	BVS3P05	-	-	4	2	-	-	-	-	50	50	50
11	AEC	Second Language	BAE3T03	2	-	-	2	3	50	50	40	-	-	-
12	FP	Field Project	BFP3P01	-	-	4	2	-	-	-	-	50	50	50
13	CC	Refer CC Basket	BCC3P03	-	-	4	2	-	-	-	-	-	100	50
Total				12	-	20	22		450	150		150	350	

B.Sc. Sem-IV (Chemistry - Major)

S N	Course Category	Name of Course	Course Code	Teaching Scheme (hrs.)			Total Credit	Examination Scheme						
				(Th)	TU	P		Theory			Practical			
								Exa m Hrs.	SEE	CIE	Mi n.	SEE	CIE	Mi n.
1	DSC	Inorganic Chemistry-3 (Coordination chemistry, Redox reactions and Inorganic Polymers)	BCH4T07	2	-	-	2	3	80	20	40			
2	DSC	Inorganic Chemistry-3 (Coordination chemistry, Redox reactions and Inorganic Polymers)	BCH4P07	-	-	2	1	-	-	-	-	25	25	25
3	DSC	Organic Chemistry-3 (Nitrogen compounds, Heterocyclics and organometallics)	BCH4T08	2	-	-	2	3	80	20	40			
4	DSC	Organic Chemistry-3 (Nitrogen compounds, Heterocyclics and organometallics)	BCH4P08	-	-	2	1	-	-	-	-	-	50	25
5	Minor	Minor 3 (Refer Minor Basket)		2	-	-	2	3	80	20	40			
6	Minor	Minor 3 (Refer Minor Basket)		-	-	2	1	-	-	-	-	25	25	25
7	Minor	Minor 4 (Refer Minor Basket)		2	-	-	2	3	80	20	40			
8	Minor	Minor 4 (Refer Minor Basket)		-	-	2	1	-	-	-	-	-	50	25
9	GE/OE	Refer GE/OE Basket	BGO4T06	2	-	-	2	3	80	20	40	-	-	-
10	SEC	Refer SEC Basket	BVS4T06	-	-	4	2	-	-	-	-	50	50	50
11	AEC	English Compulsory	BAE4T03	2	-	-	2	3	50	50	40	-	-	-
12	CEP	Community Service	BCM4P01	-	-	4	2	-	-	-	-	50	50	50
13	CC	Refer CC Basket	BCC4P04	-	-	4	2	-	-	-	-	-	100	50
Total				12	-	20	22		450	150		150	350	

Exit option; Award of UG Diploma in Major and Minor with 80-88 credits and an additional 4 credits core NSQF course/ Internship OR Continue with Major and Minor

B.Sc. Sem-V (Chemistry - Major)

S N	Course Category	Name of Course	Course Code	Teaching Scheme (hrs.)			Total Credit	Examination Scheme						
				(Th)	TU	P		Theory				Practical		
								Exa m Hrs.	SEE	CIE	Mi n.	SEE	CIE	Min.
1	DSC	Organic Chemistry-4 (NMR, Enolates and Natural products)	BCH5T09	2	-	-	2	3	80	20	40	-	-	-
2	DSC	Organic Chemistry-4 (NMR, Enolates and Natural products)	BCH5P09	-	-	2	1	-	-	-	-	25	25	25
3	DSC	Physical Chemistry-3 (Solid state, Surface Chemistry, Spectroscopy and Quantum mechanics)	BCH5T10	2	-	-	2	3	80	20	40	-	-	-
4	DSC	Physical Chemistry-3 (Solid state, Surface Chemistry, Spectroscopy and Quantum mechanics)	BCH5P10	-	-	2	1	-	-	-	-	-	50	25
5	DSC	Inorganic Chemistry-4 (Complexes and Organometallics)	BCH5T11	2	-	-	2	3	80	20	40	-	-	-
6	DSC	Inorganic Chemistry-4 (Complexes and Organometallics)	BCH5P11	-	-	2	1	-	-	-	-	25	25	25
7	DSE	Elective 1	BCH5T12	3	-	-	3	3	120	30	60	-	-	-
8	DSE	Elective 1	BCH5P12	-	-	2	1	-	-	-	-	-	50	25
9	Minor	Minor 5 (Refer Minor Basket)		2	-	-	2	3	80	20	40	-	-	-
10	Minor	Minor 5 (Refer Minor Basket)		-	-	2	1	-	-	-	-	25	25	25
11	Minor	Minor 6 (Refer Minor Basket)		2	-	-	2	3	80	20	40	-	-	-
12	Minor	Minor 6 (Refer Minor Basket)		-	-	2	1	-	-	-	-	-	50	25
13	VSC	Refer VSC Basket	BVS5P07	-	-	4	2	-	-	-	-	50	50	50
14	CEP	Community Service	BCM5P02	-	-	2	1	-	-	-	-	25	25	25
Total				13	-	18	22	-	520	130	--	150	300	-

B.Sc. Sem-VI (Chemistry - Major)

S N	Course Category	Name of Course	Course Code	Teaching Scheme (hrs.)			Total Credit	Examination Scheme						
				(Th)	TU	P		Theory			Practical			
								Exa m Hrs.	SEE	CIE	Mi n.	SEE	CIE	Min.
1	DSC	Physical Chemistry-4 (Electrochemistry, Quantum Chemistry and Characterization)	BCH6T13	2	-	-	2	3	80	20	40	-	-	-
	DSC	Physical Chemistry-4 (Electrochemistry, Quantum Chemistry and Characterization)	BCH6P13	-	-	2	1	-	-	-	-	25	25	25
2	DSC	Inorganic Chemistry-5 (Bioinorganic Chemistry)	BCH6T14	2	-	-	2	3	80	20	40	-	-	-
	DSC	Inorganic Chemistry-5 (Bioinorganic Chemistry)	BCH6P14	-	-	2	1	-	-	-	-	-	50	25
3	DSC	Organic Chemistry-5 (Molecules of life)	BCH6T15	2	-	-	2	3	80	20	40	-	-	-
	DSC	Organic Chemistry-5 (Molecules of life)	BCH6P15	-	-	2	1	-	-	-	-	25	25	25
4	DSE	Elective 2	BCH6T16	3	-	-	3	3	120	30	60	-	-	-
	DSE	Elective 2	BCH6P16	-	-	2	1	-	-	-	-	-	50	25
5	Minor	Minor 7 (Refer Minor Basket)		2	-	-	2	3	80	20	40	-	-	-
	Minor	Minor 7 (Refer Minor Basket)		-	-	2	1	-	-	-	-	25	25	25
6	VSC	Refer VSC Basket	BVS6P08	-	-	4	2	-	-	-	-	50	50	50
7	OJT	Internship (Related to DSC)	BOJ6P01	-	-	8	4	-	-	-	-	100	100	100
Total				11	-	22	22		440	110		225	325	

Exit option: Award of UG Degree in Major with 120-132 credits OR Continue with Major and Minor

B.Sc. Sem-VII (Honors) (Chemistry - Major)

S N	Course Category	Name of Course	Course Code	Teaching Scheme (hrs.)			Total Credit	Examination Scheme						
				(Th)	TU	P		Theory				Practical		
								Exam Hrs.	SEE	CIE	Min.	SEE	CIE	Min.
1	DSC	Advanced Inorganic Chemistry-1	BCH7T17	2	-	-	2	3	80	20	40	-	-	-
2	DSC	Advanced Inorganic Chemistry-1	BCH7P17	-	-	2	1	-	-	-	-	25	25	25
3	DSC	Advanced Organic Chemistry-1	BCH7T18	2	-	-	2	3	80	20	40	-	-	-
4	DSC	Advanced Organic Chemistry-1	BCH7P18	-	-	2	1	-	-	-	-	-	50	25
5	DSC	Advanced Physical Chemistry-1	BCH7T19	2	-	-	2	3	80	20	40	-	-	-
6	DSC	Advanced Physical Chemistry-1	BCH7P19	-	-	2	1	-	-	-	-	25	25	25
7	DSC	Advanced Analytical Chemistry-1	BCH7T20	2	-	-	2	3	80	20	40	-	-	-
8	DSC	Advanced Analytical Chemistry-1	BCH7P20	-	-	2	1	-	-	-	-	-	50	25
9	DSE	Elective 3	BCH7T21	3	-	-	3	3	120	30	60	-	-	-
10	DSE	Elective 3	BCH7P21	-	-	2	1	-	-	-	-	25	25	25
11	RM	Research Methodology	BCH7T22	2	-	-	2	3	80	20	40	-	-	-
12	RM	Research Methodology	BCH7P22	-	-	4	2	-	-	-	-	50	50	50
Total				13	-	14	20		520	130		125	225	

B.Sc. Sem-VIII (Honors) (Chemistry - Major)

S N	Course Category	Name of Course	Course Code	Teaching Scheme (hrs.)			Total Credit	Examination Scheme						
				(Th)	TU	P		Theory			Practical			
								Exam Hrs.	SEE	CIE	Min.	SEE	CIE	Min.
1	DSC	Advanced Inorganic Chemistry-2	BCH8T23	2	-	-	2	3	80	20	40	-	-	-
2	DSC	Advanced Inorganic Chemistry-2	BCH8P23	-	-	2	1	-	-	-	-	25	25	25
3	DSC	Advanced Organic Chemistry-2	BCH8T24	2	-	-	2	3	80	20	40	-	-	-
4	DSC	Advanced Organic Chemistry-2	BCH8P24	-	-	2	1	-	-	-	-	-	50	25
5	DSC	Advanced Physical Chemistry-2	BCH8T25	2	-	-	2	3	80	20	40	-	-	-
6	DSC	Advanced Physical Chemistry-2	BCH8P25	-	-	2	1	-	-	-	-	25	25	25
7	DSC	Advanced Analytical Chemistry-2	BCH8T26	2	-	-	2	3	80	20	40	-	-	-
8	DSC	Advanced Analytical Chemistry-2	BCH8P26	-	-	2	1	-	-	-	-	-	50	25
9	DSE	Elective 4	BCH8T27	3	-	-	3	3	120	30	60	-	-	-
10	DSE	Elective 4	BCH8P27	-	-	2	1	-	-	-	-	25	25	25
11	OJT	Apprenticeship (Related to DSC)	BOJ8P02	-	-	8	4	-	-	-	-	100	100	100
Total				11	-	18	20		440	110		175	275	

Four Year UG Honours Degree in Major and Minor with 160-176 credits

B.Sc. Sem-VII (Research) (Chemistry - Major)

S N	Course Category	Name of Course	Course Code	Teaching Scheme (hrs.)			Total Cred it	Examination Scheme						
				(Th)	TU	P		Theory				Practical		
								Exam Hrs.	SE E	CI E	M in.	SEE	CIE	Mi n.
1	DSC	Advanced Inorganic Chemistry-1	BCH7T17R	2	-	-	2	3	80	20	40	-	-	-
2	DSC	Advanced Inorganic Chemistry-1	BCH7P17R	-	-	2	1	-	-	-	-	25	25	25
3	DSC	Advanced Organic Chemistry-1	BCH7T18R	2	-	-	2	3	80	20	40	-	-	-
4	DSC	Advanced Organic Chemistry-1	BCH7P18R	-	-	2	1	-	-	-	-	-	50	25
5	DSC	Advanced Physical Chemistry-1	BCH7T19R	2	-	-	2	3	80	20	40	-	-	-
6	DSC	Advanced Physical Chemistry-1	BCH7P19R	-	-	2	1	-	-	-	-	25	25	25
7	DSE	Elective 3	BCH7T20R	3	-	-	3	3	120	30	60	-	-	-
8	DSE	Elective 3	BCH7P20R	-	-	2	1	-	-	-	-	-	50	25
9	RM	Research Methodology	BCH7T21R	2	-	-	2	3	80	20	40	-	-	-
10	RM	Research Methodology	BCH7P21R	-	-	4	2	-	-	-	-	50	50	50
11	RP	Research Project/ Dissertation (Core)	BRP7P01	-	-	6	3	-	-	-	-	75	75	75
Total				11	-	18	20		440	110		175	275	

‘R’ in the subject code indicates ‘Research’.

B.Sc. Sem-VIII (Research) (Chemistry - Major)

S N	Course Category	Name of Course	Course Code	Teaching Scheme (hrs.)			Total Credit	Examination Scheme						
				(Th)	TU	P		Theory			Practical			
								Exam Hrs.	SEE	CIE	Min	SEE	CIE	Min
1	DSC	Advanced Inorganic Chemistry-2	BCH8T22R	2	-	-	2	3	80	20	40	-	-	-
2	DSC	Advanced Inorganic Chemistry-2	BCH8P22R	-	-	2	1	-	-	-	-	25	25	25
3	DSC	Advanced Organic Chemistry-2	BCH8T23R	2	-	-	2	3	80	20	40	-	-	-
4	DSC	Advanced Organic Chemistry-2	BCH8P23R	-	-	2	1	-	-	-	-	-	50	25
5	DSC	Advanced Physical Chemistry-2	BCH8T24R	2	-	-	2	3	80	20	40	-	-	-
6	DSC	Advanced Physical Chemistry-2	BCH8P24R	-	-	2	1	-	-	-	-	25	25	25
7	DSE	Elective 4	BCH8T25R	3	-	-	3	3	120	30	60	-	-	-
8	DSE	Elective 4	BCH8P25R	-	-	2	1	-	-	-	-	-	50	25
9	RP	Research Project / Dissertation (Core)	BRP8P02	-	-	14	7 (4+2+1)	-	-	-	-	175	175	175
Total				09	-	22	20		360	90		225	325	

R' in the subject code indicates 'Research'

Four Year UG Honours with Research Degree in Major and Minor with 160-176 credits
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Total Credits:

1. Three Year UG Degree Program: 132
2. Four Year UG Degree Program: 172

Abbreviations: Generic/Open Electives: OE, Vocational Skills & Skill Enhancement Courses: VSEC, Vocational Skill Courses: VSC, Skill Enhancement Courses: SEC, Ability Enhancement Courses: AEC, Indian Knowledge Systems: IKS, Value Education Courses: VEC, On Job Training (Internship/Apprenticeship): OJT, Field Project: FP, Community Engagement & Service: CEP, Co-curricular Courses: CC, Research Methodology: RM, Research Project: RP