



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

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

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

FYUGP-Scheme I-VIII Semester

**Bachelor of Science (Honors/Research)
(Data Science - Major)
Four Year (Eight Semester Degree Course)
Teaching and Examination Scheme**

B.Sc. Sem-I (Data Science - 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	Mi n.	SEE	CIE	Mi n.
1	DSC	Linear Algebra	BDS1T01	2	-	-	2	3	80	20	40	-	-	-
2	DSC	Linear Algebra	BDS1P01	-	-	2	1	-	-	-	-	25	25	25
3	DSC	Programming with 'C++'	BDS1T02	2	-	-	2	3	80	20	40	-	-	-
4	DSC	Programming with 'C++'	BDS1P02	-	-	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	Office Automation	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 (Data Science - 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	Mi n.	SEE	CIE	Mi n.
1	DSC	Data Structure	BDS2T03	2	-	-	2	3	80	20	40	-	-	-
2	DSC	Data Structure	BDS2P03	-	-	2	1	-	-	-	-	25	25	25
3	DSC	Probability and Statistics	BDS2T04	2	-	-	2	3	80	20	40	-	-	-
4	DSC	Probability and Statistics	BDS2P04	-	-	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	Computer Animation	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 (Data Science - 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	Mi n.	SEE	CIE	Mi n.
1	DSC	JAVA Programming	BDS3T05	2	-	-	2	3	80	20	40	-	-	-
2	DSC	JAVA Programming	BDS3P05	-	-	2	1	-	-	-	-	25	25	25
3	DSC	Digital Electronics and Microprocessor	BDS3T06	2	-	-	2	3	80	20	40	-	-	-
4	DSC	Digital Electronics and Microprocessor	BDS3P06	-	-	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 (Data Science - 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	Mi n.	SEE	CIE	Mi n.
1	DSC	Operating System and Linux	BDS4T07	2	-	-	2	3	80	20	40	-	-	-
2	DSC	Operating System and Linux	BDS4P07			2	1	-	-	-	-	25	25	25
3	DSC	Database Management System	BDS4T08	2	-	-	2	3	80	20	40	-	-	-
4	DSC	Database Management System	BDS4P08			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	BVS4P06	-	-	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 (Data Science - 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	Mi n.	SEE	CIE	Min.
1	DSC	SQL and PL/SQL	BDS5T09	2	-	-	2	3	80	20	40	-	-	-
2	DSC	SQL and PL/SQL	BDS5P09	-	-	2	1	-	-	-	-	25	25	25
3	DSC	Data Communication and Networks	BDS5T10	2	-	-	2	3	80	20	40	-	-	-
4	DSC	Data Communication and Networks	BDS5P10	-	-	2	1	-	-	-	-	-	50	25
5	DSC	Statistical Inference	BDS5T11	2	-	-	2	3	80	20	40	-	-	-
6	DSC	Statistical Inference	BDS5P11	-	-	2	1	-	-	-	-	25	25	25
7	DSE	Elective 1	BDS5T12	3	-	-	3	3	120	30	60	-	-	-
8	DSE	Elective 1	BDS5P12	-	-	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 (Data Science - 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	Mi n.	SEE	CIE	Min.
1	DSC	Python Programming	BDS6T13	2	-	-	2	3	80	20	40	-	-	-
2	DSC	Python Programming	BDS6P13	-	-	2	1	-	-	-	-	25	25	25
3	DSC	Artificial Intelligence	BDS6T14	2	-	-	2	3	80	20	40	-	-	-
4	DSC	Artificial Intelligence	BDS6P14	-	-	2	1	-	-	-	-	-	50	25
5	DSC	Cyber Security	BDS6T15	2	-	-	2	3	80	20	40	-	-	-
6	DSC	Cyber Security	BDS6P15	-	-	2	1	-	-	-	-	25	25	25
7	DSE	Elective 2	BDS6T16	3	-	-	3	3	120	30	60	-	-	-
8	DSE	Elective 2	BDS6P16	-	-	2	1	-	-	-	-	-	50	25
9	Minor	Minor 7 (Refer Minor Basket)		2	-	-	2	3	80	20	40	-	-	-
10	Minor	Minor 7 (Refer Minor Basket)		-	-	2	1	-	-	-	-	25	25	25
11	VSC	Refer VSC Basket	BVS6P08	-	-	4	2	-	-	-	-	50	50	50
12	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) (Data Science - 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. n.	SEE	CIE	Min.
1	DSC	Machine Learning	BDS7T17	2	-	-	2	3	80	20	40	-	-	-
2	DSC	Machine Learning	BDS7P17	-	-	2	1	-	-	-	-	25	25	25
3	DSC	Compiler Construction	BDS7T18	2	-	-	2	3	80	20	40	-	-	-
4	DSC	Compiler Construction	BDS7P18	-	-	2	1	-	-	-	-	-	50	25
5	DSC	Computer Graphics	BDS7T19	2	-	-	2	3	80	20	40	-	-	-
6	DSC	Computer Graphics	BDS7P19	-	-	2	1	-	-	-	-	25	25	25
7	DSC	Operation Research	BDS7T20	2	-	-	2	3	80	20	40	-	-	-
8	DSC	Operation Research	BDS7P20	-	-	2	1	-	-	-	-	-	50	25
9	DSE	Elective 3	BDS7T21	3	-	-	3	3	120	30	60	-	-	-
10	DSE	Elective 3	BDS7P21	-	-	2	1	-	-	-	-	25	25	25
11	RM	Research Methodology	BDS7T22	2	-	-	2	3	80	20	40	-	-	-
12	RM	Research Methodology	BDS7P22	-	-	4	2	-	-	-	-	50	50	50
Total				13	-	14	20		520	130		125	225	

B.Sc. Sem-VIII (Honors) (Data Science - 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. n.	SEE	CIE	Min.
1	DSC	Advance Java Programming	BDS8T23	2	-	-	2	3	80	20	40	-	-	-
2	DSC	Advance Java Programming	BDS8P23	-	-	2	1	-	-	-	-	25	25	25
3	DSC	Time Series Analysis	BDS8T24	2	-	-	2	3	80	20	40	-	-	-
4	DSC	Time Series Analysis	BDS8P24	-	-	2	1	-	-	-	-	-	50	25
5	DSC	Soft Computing	BDS8T25	2	-	-	2	3	80	20	40	-	-	-
6	DSC	Soft Computing	BDS8P25	-	-	2	1	-	-	-	-	25	25	25
7	DSC	R-Programming	BDS8T26	2	-	-	2	3	80	20	40	-	-	-
8	DSC	R-Programming	BDS8P26	-	-	2	1	-	-	-	-	-	50	25
9	DSE	Elective 4	BDS8T27	3	-	-	3	3	120	30	60	-	-	-
10	DSE	Elective 4	BDS8P27	-	-	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) (Data Science - Major)

S N	Course Categor y	Name of Course	Course Code	Teaching Scheme (hrs.)			Total Credit	Examination Scheme						
				(Th)	TU	P		Theory				Practical		
								Exam Hrs.	SEE	CIE	Mi n.	SEE	CIE	Min .
1	DSC	Machine Learning	BDS7T17R	2	-	-	2	3	80	20	40	-	-	-
2	DSC	Machine Learning	BDS7P17R	-	-	2	1	-	-	-	-	25	25	25
3	DSC	Compiler Construction	BDS7T18R	2	-	-	2	3	80	20	40	-	-	-
4	DSC	Compiler Construction	BDS7P18R	-	-	2	1	-	-	-	-	-	50	25
5	DSC	Computer Graphics	BDS7T19R	2	-	-	2	3	80	20	40	-	-	-
6	DSC	Computer Graphics	BDS7P19R	-	-	2	1	-	-	-	-	25	25	25
7	DSE	Elective 3	BDS7T20R	3	-	-	3	3	120	30	60	-	-	-
8	DSE	Elective 3	BDS7P20R	-	-	2	1	-	-	-	-	-	50	25
9	RM	Research Methodology	BDS7T21R	2	-	-	2	3	80	20	40	-	-	-
10	RM	Research Methodology	BDS7P21R	-	-	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) (Data Science - 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 Java Programming	BDS8T22R	2	-	-	2	3	80	20	40	-	-	-
2	DSC	Advanced Java Programming	BDS8P22R	-	-	2	1	-	-	-	-	25	25	25
3	DSC	Time Series Analysis	BDS8T23R	2	-	-	2	3	80	20	40	-	-	-
4	DSC	Time Series Analysis	BDS8P23R	-	-	2	1	-	-	-	-	-	50	25
5	DSC	Soft Computing	BDS8T24R	2	-	-	2	3	80	20	40	-	-	-
6	DSC	Soft Computing	BDS8P24R	-	-	2	1	-	-	-	-	25	25	25
7	DSE	Elective 4	BDS8T25R	3	-	-	3	3	120	30	60	-	-	-
8	DSE	Elective 4	BDS8P25R	-	-	2	1	-	-	-	-	-	50	25
5	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

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