BIRLA INSTITUTE OF TECHNOLOGY-MESRA, RANCHI
COURSE STRUCTURE FOR
BACHELOR OF SCIENCE (AI & Data Science)
(w.e.f. Academic Session 2025-26)
(Proposed)

Semester/ Session of Study (Recommended)	Course Level	Category of Course	Course Code	Courses	Mode of delivery and credits L-Lecture; T-Tutorial; P-Practical			Total Credits C
					L	T	P	C
		THEORY						
First Monsoon	FIRST	DSC	XX25101	Programming with C	3	0	0	3
		DSC	XX25103	Basics of Operating Systems	3	0	0	3
		DSC	XX25105	Fundamentals of Computer Science	2	0	0	2
		DSC	XX25107	Introductory Mathematics for Artificial Intelligence & Data Science	3	0	0	3
		VAC – Elective		VAC Elective I	2	0	0	2
		SEC-SB Elective		SEC-SB Elective I	2	0	2	3
		VAC – Elective		VAC Elective II	1	0	2	2
		LABORATORIES						
		AECC	HS24131	Communication Skills-I	0	0	3	1.5
		DSC	XX25102	Programming with C Lab	0	0	3	1.5
		TOTAL						21

Semester / Session of Study (Recommended)	Course Level	Category of Course	Course Code	Courses	Mode of delivery & credits L-Lecture; T-Tutorial; P-Practical			Total Credits C
					L (Periods /week)	T (Periods /week)	P (Periods /week)	C
		THEORY						
Second Spring	FIRST	DSC	XX25111	Introduction to Data Structures	3	1	0	4
		DSC	XX25113	Basics of Digital Computer and Logic Design	3	1	0	4
		MDC	XX25115	Mathematics for Data Science	3	0	0	3
		VAC – Elective		VAC Elective III	3	0	0	3
		LABORATORIES						
		SEC-SB Elective		SEC-SB Elective II	0	0	4	2
		AECC	HS24132	Communication Skills- II	0	0	3	1.5
		DSC	XX25112	Data Structures Lab	0	0	3	1.5
		Total						19

Total Credits after I year :40

EXIT OPTION WITH CERTIFICATION IN AI & DATA SCIENCE after completing Internship or work based vocational courses during summer break of 4 credits.

Semester/ Session of Study (Recommended)	Course Level	Category of Course	Course Code	Courses	Mode of delivery and credits L-Lecture; T-Tutorial; P-Practical			Total Credits C
					L (Periods/ week)	T (Periods/week)	P (Periods /week)	C
Third Monsoon	SECOND	**THEORY**						
		DSC	XX25201	Python Programming	3	0	0	3
		DSC	XX25203	Database Management System	3	0	0	3
		MDC	XX25205	Mathematics for Artificial Intelligence	3	0	0	3
		MDC		Principles of Management	3	0	0	3
		AECC		Public speaking and creative writing	1	0	2	2
		SEC-SB		SEC-SB Elective III	2	0	2	3
		LABORATORIES						
		DSC	XX25202	Python Programming Lab	0	0	3	1.5
		DSC	XX25204	DBMS Lab	0	0	3	1.5
		TOTAL						**20**

Semester/ Session of Study (Recommended)	Course Level	Category of Course	Course Code	Courses	Mode of delivery and credits L-Lecture; T-Tutorial; P-Practical			Total Credits
					L (Periods /week)	T (Periods /week)	P (Periods /week)	C
Fourth Spring	SECOND	**THEORY**						
		DSC	XX25211	Software Engineering	3	0	0	3
		DSC	XX25213	Computer Networks	3	0	0	3
		DSC	XX25215	Analysis of Algorithm	3	1	0	4
		DSC	XX25217	Introduction to AI	3	0	0	3
		AECC		Personality Development	2	0	2	3
		LABORATORIES						
		DSC	XX25212	Software Engineering Lab	0	0	3	1.5
		DSC	XX25216	Analysis of Algorithm lab	0	0	3	1.5
		DSC	XX25218	Minor Project-1	0	0	2	1
		Total						**20**

Total Credits after II year : 40+40=80
EXIT OPTION WITH DIPLOMA IN AI & DATA SCIENCE after completing Internship or work based vocational courses during summer break of 4 credits.

Semester/ Session of Study (Recommended)	Course Level	Category of Course	Course Code	Courses	Mode of delivery and credits L-Lecture; T-Tutorial; P-Practical			Total Credits
					L (Periods /week)	T (Periods /week)	P (Periods /week)	C
Fifth Monsoon	THIRD	**THEORY**						
		DSC		Machine Learning	3	1	0	4
		DSC		Data Analytics using Python	3	0	0	3
		DSE		**DSE-1**	3	0	0	3
		DSC		Advanced AI techniques	3	1	0	4
		LABORATORIES						
		DSC		Machine Learning Lab	0	0	4	2
		DSC		Data Analytics Lab	0	0	4	2
		Minor Internship/ Project		Minor Project-2	0	0	0	2
		TOTAL						**20**

Semester/ Session of Study (Recommended)	Course Level	Category of Course	Course Code	Courses	Mode of delivery and credits L-Lecture; T-Tutorial; P-Practical			Total Credits
					L (Periods /week)	T (Periods /week)	P (Periods /week)	C
Sixth Spring	THIRD	**THEORY**						
		DSC		Deep Learning	3	0	0	3
		DSC		Natural Language Processing	3	0	0	3
		MDC		Research Methodology	3	0	0	3
		DSE		**DSE -II**	**3**	**1**	**0**	**4**
		DSC		Deep Learning Lab	0	0	4	2
		DSC		NLP Lab	0	0	4	2
		DSC		Project	0	0	0	3
		TOTAL						**20**

Total Credits after III years :40+40+40=120
EXIT OPTION WITH B.Sc. Degree In AI & DATA SCIENCE

Semester/ Session of Study (Recommended)	Course Level	Category of Course	Course Code	Courses	Mode of delivery and credits L-Lecture; T-Tutorial; P-Practical			Total Credits
					L (Periods /week)	T (Periods /week)	P (Periods /week)	C
		THEORY						
Seventh Monsoon	**FOURTH**	DSC		Blockchain Technology	3	1	0	4
		DSC		Optimization Techniques	3	1	0	4
		DSC		Big Data Analytics	3	1	0	4
		DSE		**DSE-III**	**3**	**1**	**0**	**4**
		LABORATORIES						
		DSE		**DSE-III Lab**	0	0	4	2
		DSC		Big Data Analytics Lab	0	0	4	2
	TOTAL							**20**

Semester/ Session of Study (Recommended)	Course Level	Category of Course	Course Code	Courses	Mode of delivery and credits L-Lecture; T-Tutorial; P-Practical			Total Credits
					L (Periods /week)	T (Periods /week)	P (Periods /week)	C
		THEORY						
Eighth Spring	**FOURTH**	DSC		Business & Finance Analytics	3	0	0	3
		DSC		Digital Marketing & Social Media Analytics	3	0	0	3
		LABORATORIES						
		DSC		Business & Finance Analytics **Lab**	0	0	4	2
		Research Project/Dissertation		Research project /Internship with Viva-voce and seminar presentation.	0	0	0	12
	TOTAL							**20**

Total Credits after IV years:40+40+40+40=160

(i) After four years B.Sc. Honours (AI & Data Science) will be given

or

(ii) Students who secure 7.5 CGPA and above at the end of sixth semester are eligible to undertake research stream in the fourth year and have to complete Research Project/Dissertation (12 Credits) to become eligible for "Honours with Research" degree

Discipline Specific Elective Courses(DSE)

	L	T	P	C		L	T	P	C
Cloud computing	3	0	0	3	Computer Vision	3	1	0	4
Regression Techniques & Time Series Analysis	3	1	0	4	Computer Vision Lab	0	0	4	2
Data Visualization	3	0	0	3	Cloud Application Development	3	1	0	4
Visual Programming	3	0	0	3	Cloud Application Development Lab	0	0	4	2
Visual Programming Lab	0	0	4	2	System Programming	3	1	0	4
Linux programming	3	1	0	4	System Programming Lab	0	0	4	2
Linux programming Lab	0	0	4	2	Robotics	3	1	0	4
Software Project Management	3	1	0	4	Cyber Physical Systems	3	0	0	3
Object Oriented Analysis and Design	3	0	0	3	Augmented Reality and Virtual Reality	3	1	0	4
Soft Computing	3	1	0	4	Internet of Things	3	0	0	3
Cyber Forensics	3	0	0	3	Internet of Things Lab	0	0	4	2
Wireless Networks	3	1	0	4	Full Stack Application Development	3	0	0	3
Edge Computing	3	0	0	3	Full Stack Application Development Lab	0	0	4	2

Acronyms Expanded

- AEC : Ability Enhancement Course
- DSC : Discipline Specific Core (Course)
- DSE : Discipline Specific Elective (Course)
- VAC :Value Added Course
- SEC-SB : Skill Enhancement Course-Skill Based
- MDC : Multidisciplinary Course

Ability Enhancement Course(AEC)

Code	Subject	L	T	P	C
HS24131	Communication Skills-1	0	0	3	1.5
HS24132	Communication Skills-2	0	0	3	1.5
MN109	Public speaking and creative writing	2	0	0	2
MN201	Personality Development	3	0	0	3
Total					8

Skill Enhancement Course-Skill Based (SEC-SB)

Code	Subject	L	T	P	C
CN111 / CN113	Office Automation Tools/Linux administration	2	0	2	3
CN126 / CN128	MatLab Programming Lab/ Latex Lab	2	0	2	3
CN209 / MN203	Statistics with R/ Computerized Accounting	2	0	2	3
					9

Value Added Courses (VAC)

Code	Subject	L	T	P	C
MN111 / MN112	Digital Empowerment /Emotional Intelligence	2	0	0	2
MN103 / MN104	Yoga/Physical Education	1	0	2	2
MN102 / CN109	Human Values and Professional Ethics/ Environmental Science	2	0	0	2
	Total				6

Multidisciplinary/Interdisciplinary Course (MDC)

Code	Subject	L	T	P	C
MN106	Principle of Management	3	0	0	3
XX25115	Mathematics for Data Science	3	0	0	3
XX25205	Mathematics for Artificial Intelligence	3	0	0	3
	Total				9