

Semester Wise Course Structure for BSc CS DS

Semester 1

Se m 1	Course Type	Course Title	Cred its	Hr/ Wk	Hou rs	Mar ks
1	BRI	Mathematical and Statistical Foundations for Computational Sciences	0	-	30	-
1	MC - 1	Computer Systems Fundamentals	4	4	60	100
1	MC - 2	Data Science Principles: Theory & Applications	4	4	60	100
1	Minor	Calculus for Computational Sciences	3	3	45	100
1	SEC - 1	Algorithmic Problem Solving in C (CIA Only)	3	5	75	150
1	SEC - 2	Web Technologies (CIA Only)	3	5	75	100
1	MDC	Multi Disciplinary Course	3	3	45	50
1	AEC	English - I	2	2	30	50
1	VAC	Holistic Education - I	1	1	15	-
1	VAC	Environmental Studies	1	-	-	-
		Total	24	27	435	650

Semester 2

Sem	Course Type	Course Title	Credits	Hr/Wk	Hours	Marks
2	BRI	Descriptive Statistics	0	-	15	-
2	MC - 1 (CS)	Data Structures and Algorithms	3	3	45	100
2	MC - 1 (CS)	Data Structures and Algorithms Lab	2	4	60	100
2	MC - 1 (CS)	Python for Scientific and Computational Programming (CIA Only)	3	5	75	100
2	MC - 2 (DS)	Data Mining and Exploratory Data Analysis	4	4	60	100
2	MC - 2 (DS)	Probability Distribution Theory and Applications	4	4	60	100
2	Minor	Discrete Mathematics	3	3	45	100
2	MDC	Multi Disciplinary Course	3	3	45	50
2	AEC	English - II	2	2	30	50
2	VAC	Holistic Education - II	1	1	15	-
2	VAC	Understanding of India	1	-	-	-
		Total	26	29	450	700

Semester 3

Se m	Course Type	Course Title	Credits	Hr/Wk	Hours	Marks
3	PRE	Data Wrangling & Data Visualisation	0	1	15	-
3	MC - 1 (CS)	Operating Systems	2	2	30	50
3	MC - 1 (CS)	Database Management Systems (CIA Only)	3	5	75	100
3	MC - 2 (DS)	Soft Computing & Artificial Intelligence (CIA Only)	2	3	45	50
3	MC - 2 (DS)	Sampling Estimation & Hypothesis Testing	3	3	45	100
3	Minor	Linear Algebra	3	3	45	100
3	SEC	Unstructured Data Acquisition and Business Intelligence	3	4	60	100
3	MDC	Multi Disciplinary Course	3	3	45	50
3	AEC	Indian & Foreign Languages - I	2	2	30	50
3	VAC	Holistic Education - III	1	1	15	-
		Total	22	27	405	600

Semester 4

Se m	Course Type	Course Title	Cred its	Hr/ Wk	Hou rs	Mar ks
4	PRE	User Interfaces and User Experience	0	1	15	-
4	MC - 1 (CS)	Full Stack Web Development (CIA Only)	5	6	90	150
4	MC - 1 (CS)	Computer Networks & Communication Protocols	3	3	45	100
4	MC - 2 (DS)	Machine Learning: Supervised Techniques (CIA Only)	5	6	90	150
4	MC - 2 (DS)	Parametric Methods & Regression Analysis	3	3	45	100
4	Minor	Advanced Calculus	3	3	45	100
4	AEC	Indian & Foreign Languages - I	2	2	30	50
4	VAC	Holistic Education - III	1	1	15	-
		Total	22	25	375	650

Semester 5

Se m	Course Type	Course Title	Cred its	Hr/ Wk	Hou rs	Mar ks
5	PRE	Contemporary Developments in Technology	0	1	15	-
5	MC - 1 (CS)	Analysis and Design of Algorithms	4	4	60	100
5	MC - 1 (CS)	Computer Science Elective (CIA Only) 1. Digital Image Processing & Image Analytics 2. Microservices Architectures & APIs 3. Mobile Application Development 4. Game Development & Programming 5. Aurgmented Reality (AR) and Virtual Reality (VR)	4	6	90	150
5	MC - 2 (DS)	Advanced Machine Learning & Neural Networks (CIA Only)	4	4	60	100
5	MC - 2 (DS)	Data Science Elective 1. Natural Language Processing 2. Personalised Recommendation Systems 3. Big Data Analytics 4. Digital Twins 5. High Performance Computing & FaaS	4	6	90	150
5	VAC	Ethics and Technology	1	1	15	0
5	Internship	Internship	2	-	-	100
5	Minor	Mathematics - IV - Elective: 1. Real & Complex Analysis 2. Number Theory & Cryptography 3. Financial Mathematics 4. Graph Theory & Topology 5. Mathematical Modelling	3	3	45	100
		Total	22	25	375	700

Semester 6

Se m	Course Type	Course Title	Cred its	Hr/ Wk	Hou rs	Mar ks
6	PRE	Project Presentation Skills	0	1	15	-
6	MC - 1 (CS)	Cloud Computing and Virtualisation (CIA Only)	5	6	90	150
6	MC - 1 (CS)	CS 2 - Interdisciplinary Elective: 1. Embedded Systems & IoT 2. Remote Sensing Techniques 3. 5G Networks and Beyond 4. Simulation Techniques 5. Processor Programming	4	4	60	100
6	MC - 2 (DS)	Deep Learning Models (CIA Only)	5	6	90	150
6	MC - 2 (DS)	DS 2 - Interdisciplinary Elective: 1. System Sciences 2. Bioinformatics Computing 3. Computational Neuroscience and Cognitive Modeling 4. Autonomous Vehicles and Self Driving Cars 5. Quantum Computing	4	4	60	100
6	Project	Mini Project	4	8	120	200
		Total	22	29	435	700

Semester 7

Se m	Course Type	Course Title	Cred its	Hr/ Wk	Hou rs	Mar ks
7	MC - 1 (CS) Hons	Distributed Systems & Blockchain Technology	4	4	60	100
7	MC - 1 (CS) Hons	Specialisation Elective: 1. Modern Application Development using Containers 2. Edge Computing 3. Processor Design 4. Quantum Computing 5. Research Writing (Hons with Research)	4	4	60	100
7	MC - 1 (CS) Hons	Secure App Development (CIA Only)	5	6	90	150
7	MC - 1 (CS) Hons	CS 4 - Technology Trends Elective (CIA Only): 1. System Optimisation 2. AI Programming 3. DevOps and Continuous Integration 4. Smart Manufacturing 5. Research Methods in Science (Hons with Research)	4	5	75	100
7	MC - 1 (CS) Hons	Domain-specific Skill Development Platforms (CIA Only) 1. No-Code Development Tools 2. Research Tools (Hons with Research)	3	4	60	100

7	MC - 1 (CS) Hons	Penultimate Project: 1. Specialisation Project 1. Research Project	4	8	16	200
7	Internship	Internship	2	-	-	100
7	MC - 2 (DS) Hons	Explainable AI and AI TRiSM	4	4	60	100
7	MC - 2 (DS) Hons	DS 2 (Specialization Elective): 1. Time Series Analysis & Forecasting Techniques 2. Reinforcement Learning 3. Self Supervised Learning 4. Optimisation Techniques 5. Research Writing (Hons with Research)	4	4	60	100
7	MC - 2 (DS) Hons	Human-Centred AI (CIA Only)	5	6	90	150
7	MC - 2 (DS) Hons	DS 4 - Data Science / Industry Trends Elective (CIA Only): 1. Geospatial Analytics 2. Automated ML 3. AI in Healthcare & Bioinformatics 4. FinTech 5. Research Methods in Science (Hons with Research)	4	5	75	100
7	MC - 2 (DS) Hons	Domain-specific Skill Development Platforms (CIA Only) 1. No-Code Model Training 2. Research Tools (Hons with Research)	3	4	60	100
7	MC - 2 (DS) Hons	Penultimate Project: 1. Specialisation Project 1. Research Project	4	8	16	200

Semester 8

Se m	Course Type	Course Title	Cred its	Hr/ Wk	Hou rs	Mar ks
8	MC - 1 (CS) Hons	Real-Time Systems and Embedded Security	3	3	45	100
8	MC - 1 (CS) Hons	Digital Transformation and Industry 4.0	3	3	45	100
8	MC - 2 (DS) Hons	Dynamic Systems and Simulation	3	3	45	100
8	MC - 2 (DS) Hons	AI for Industrial Automation	3	3	45	100
8	MOOC	MOOC 1	2	-	-	50
8	MOOC	MOOC 2	2	-	-	50
8	Project	Captstone: 1. Industry Project 2. Research Project (Honours with Research)	8	-	-	300

