

SEMESTER-WISE BREAKDOWN FOR BACHELOR PROGRAMS

a. BS in Data Science (131 Credit Hours)

	COURSE CODE	COURSE TITLE	LECTURE HOURS	LAB HOURS	CREDIT HOURS	PRE-REQ	CO-REQ
1st Semester	CH101	Applied Chemistry & Environment	2	0	2	-	-
	CH161	Occupational Health and Safety	1	0	1	-	-
	CS101	Computing and AI	2	0	2	-	-
	HM101	Communication Skills	1	6	3	-	-
	MT101	Calculus I	3	0	3	-	-
	PH101	Applied Physics	3	0	3	-	-
	CS101L	Computing and AI Lab	0	3	1	-	CS101
	IF101L	Innovation and Makers Lab1	0	3	1	-	-
	PH101L	Applied Physics Lab	0	3	1	-	PH101
2nd Semester	CS112	Object Oriented Programming and Design	3	0	3	CS101	-
	ES111	Probability and Statistics	3	0	3	MT101	-
	HM102	Critical Thinking and Expository Writing	2	3	3	-	-
	MM101	Materials and Nanotechnology	2	0	2	-	-
	MT102	Differential Equations and Linear Algebra I	3	0	3	MT101	-
	CS112L	Object Oriented Programming and Design Lab	0	3	1	-	CS112
	IF102L	Innovation and Makers Lab II	0	3	1	IF101L	-
	MM101L	Materials and Nanotechnology Lab	0	3	1	-	MM101
3rd Semester	CE221	Digital Logic Design	3	0	3	-	-
	CS202	Information and Communication Technologies	2	0	2	-	-
	CS231	Discrete Mathematics	3	0	3	-	-
	CS221	Data Structures and Algorithms	3	0	3	CS112	-
	DS221	Inferential Statistics and Applied Probability	3	0	3	ES111	-
	CE221L	Digital Logic Design Lab	0	3	1	-	CE221
	CS221L	Data Structures and Algorithms Lab	0	3	1	-	CS221
4th Semester	CE222	Computer Organization & Assembly Language	3	0	3	CE221	-
	CS241	Database Management Systems	3	0	3	CS112	-
	DS211	Theory of Data Science	3	0	3	CS112	-
	ES205	Advanced Linear Algebra	3	0	3	MT102	-
	HM211	Pakistan and Islamic Studies	3	0	3	-	-
	CE222L	Computer Organization & Assembly Lang. Lab	0	3	1	-	CE222
	CS241L	Database Management Systems	0	3	1	-	CS232

5th Semester	CS311	Operating Systems	3	0	3	CS221	-
	CS331	Software Engineering	3	0	3	CS231	-
	CS351	Artificial Intelligence	3	0	3	CS221	-
	CS391	Entrepreneurship and Technology Commercialization	3	0	3	-	-
	DS341	Data Mining	3	0	3	DS221	-
	CS311L	Operating Systems Lab	0	3	1	-	CS311
	CS351L	Artificial Intelligence Lab	0	3	1	-	-

6th Semester	CE313	Computer Communications and Networks	3	0	3	CS231	-
	CS322	Design & Analysis of Algorithms	3	0	3	CS231	-
	CS392	Professional Issues in IT	3	0	3	CS202	-
	DS351	Data Visualization	2	0	2	DS341	-
	XX3xx	DS Elective (Breadth) – I	3	0	3	**	**
	DS351L	Data Visualization Lab	0	3	1	-	DS351

7th Semester	CS462	Parallel Processing & Distributed Computing	3	0	3	CS311	-
	CS481	Senior Design Project (Part-I)	3	0	3	-	-
	DS431	Data Warehousing & Business Intelligence	3	0	3	DS211	-
	DS461	Big Data Analytics	3	0	3	DS221	-
	XX4xx	DS Specialization Elective (Breadth) II	3	0	3	**	**
	DS431L	Data Warehousing & Business Intelligence Lab	0	3	1	-	DS431
	DS461L	Big Data Analytics Lab	0	3	1	-	DS461

8th Semester	CS471	Data & Network Security	3	0	3	CE313	-
	CS482	Senior Design Project (Part-II)	3	0	3	-	-
	CS494	Software Project Management	3	0	3	CS325	-
	DS4xx	DS Specialization Elective (Depth)	3	0	3	**	**
	XX4xx	DS Specialization Elective (Breadth) III	3	0	3	**	**

** means that the pre-requisites or the co-requisites may vary depending on the electives.
