

**Department of Data Science**  
**Univeristy of the Punjab, Lahore, Pakistan**  
**Model Scheme of Study for BS Data Science**

Semester I					
Sr#	Code	Course Title	Type	Prerequisite	Credit hours
1	HQ-001	Quran with Translation	--		0.5
2	MS-001	Pre-Calculus-1	--		0
3	GE-104	English Composition and Comprehension	GE		3
4	GE-102	Pakistan Studies	GE		2
5	GE-103	Introduction to Information and Communication Technologies	GE		2-1
6	CC-101	Discrete Structures	CC		3
7	CC-102	Programming Fundamentals	CC		3-1
Semester II					
Sr#	Code	Course Title	Type	Prerequisite	Credit hours
8	HQ-002	Quran with Translation	--		0.5
9	MS-002	Pre-Calculus-2	--	Pre-Calculus-1	0
10	MS101	Probability and Statistics	MS		3
11	GE-101	Islamic Studies	GE		2
12	GE-105	Communication and Presentation Skills	GE	English Composition and Comprehension	3
13	CS-101	Digital Logic Design	CS		3-1
14	CC-201	Object Oriented Programming	CC	Programming Fundamentals	3-1
Semester III					
Sr#	Code	Course Title	Type	Prerequisite	Credit hours
15	HQ-003	Quran with Translation	--		0.5
16	MS-201	Calculus and Analytical Geometry	MS		3
17	MS-202	Linear Algebra	MS		3
18	UE-2--	University Elective (Economy Related)	UE		3
19	CC-205	Data Structures and Algorithms	CC	Programming Fundamentals	3-1
20	CC-203	Database Systems	CC		3-1
Semester IV					
Sr#	Code	Course Title	Type	Prerequisite	Credit hours
21	HQ-004	Quran with Translation	--		0.5
22	MS-203	Differential Equations	MS	Calculus and Analytical Geometry	3
23	CC-303	Software engineering	CC		3
24	CS-201	Computer Organization and Assembly Language	CS	Digital Logic Design	3-1
25	CS-203	Artificial Intelligence	CS	Object Oriented Programming	3-1
26	DS-201	Advanced Statistics	DC	Probability and Statistics	3
Semester V					
Sr#	Code	Course Title	Type	Prerequisite	Credit hours
27	HQ-005	Quran with Translation	--		0.5
28	UE-3--	University Elective (Foreign Language/Arabic Language)	UE		2
29	DS-3--	Data Science Elective I	DE		3
30	CC-301	Operating Systems	CC	Data Structures and Algorithms	3-1
31	DS-308	Data Visualization	DC		2-1
32	CS-301	Analysis of Algorithms	CS	Data Structures and Algorithms	3
33	DS-302	Introduction to Data Science	DC	Artificial Intelligence	2-1
Semester VI					
Sr#	Code	Course Title	Type	Prerequisite	Credit hours
34	HQ-006	Quran with Translation	--		0.5
35	CC-305	Computer Networks	CC		3-1
36	DS-304	Data Mining	DC	Advanced Statistics, Introduction to Data Science	2-1
37	DS-306	Data Warehousing and Business Intelligence	DC	Introduction to Data Science	2-1
38	DS-3--	Data Science Elective II	DE		3
39	DS-3--	Data Science Elective III	DE		3
Semester VII					
Sr#	Code	Course Title	Type	Prerequisite	Credit hours
40	HQ-007	Quran with Translation	--		0.5
41	CC-401	Final Year Project-1	CC		2
42	GE-401	Technical and Business Writing	GE	Communication and Presentation Skills	3
43	UE-4--	University Elective (Social Science Related)	UE		3
44	CS-401	Parallel and Distributed Computing	CS	Operating Systems, Data Structures and Algorithms	2-1
45	DS-401	Big Data Analytics	DC	Data Warehousing and Business Intelligence	2-1
46	DS-4--	Data Science Elective IV	DE		3
Semester VIII					
Sr#	Code	Course Title	Type	Prerequisite	Credit hours
47	HQ-008	Quran with Translation	--		0.5
48	CC-402	Final Year Project-2	CC	Final Year Project-1	4
49	CC-403	Information Security	CC		3
50	UE-4--	University Elective (Management Related)	UE		3
51	UE-4--	University Elective (Social Services)	UE		1
52	GE-402	Professional Practices	GE		3