BACHELOR OF SCIENCE IN DATA SCIENCE

Course Curriculum

Semester-1						
No	Code	Title	Credit Hours	Related SDG	Pre Requisite	Contents
1	CS-110	Fundamentals of Computer Programming	3+1	4,9		⚠
2	MATH-101	Calculus & Analytical Geometry	3+0	4,8,9,16		⚠
3	MATH-161	Discrete Mathematics	3+0	4,9		⚠
4	HU-114	Functional English	3+0	4		⚠
5	CS-108	Application of Information & Communication Technologies	2+1	4		⚠
6		Total CHs	14+2			

Semester-2

No	Code	Title	Credit Hours	Related SDG	Pre Requisite	Contents
1	CS-220	Database Systems	3+1	4,9		⚠️
2	CS-212	Object Oriented Programming	3+1	1,2,4,9,16	CS-114 Fundamental of Programming	⚠️
3	MATH-222	Linear Algebra	3+0	4	MATH-101	⚠️
4	MATH-234	Multivariable Calculus	3+0	4,9	MATH-101	⚠️
5	EE-223	Digital Logic Design	2+1	4		⚠️
6		Total CHs	14+3			

Semester-3						
No	Code	Title	Credit Hours	Related SDG	Pre Requisite	Contents
1	MATH-361	Probability & Statistics	3+0	4,8,9,12,16		⚠️

No	Code	Title	Credit Hours	Related SDG	Pre Requisite	Contents
2	CS-353	Information Security	2+1	4,8,9		⚠
3	HU-101	Islamic Studies	2+0	4 , 16		⚠
4	CS-250	Data Structures & Algorithms	3+1	4,9	CS-110 Fundamental of Programming	⚠
5	CS-272	Artificial Intelligence	2+1	4		⚠
6	EE-347	Computer Networks	2+1	4		⚠
7		Total Chs	14+4			

Semester-4						
No	Code	Title	Credit Hours	Related SDG	Pre Requisite	Contents
1	DS-401	Introduction to Data Science	2+1	4		
2	PHY-102	Applied Physics	2+1	4,9,12,15		⚠

No	Code	Title	Credit Hours	Related SDG	Pre Requisite	Contents
3	ENGL-104	Expository Writing	3+0	4	HU-114	⚠️
4	CS-234	Computer Organization and Assembly Language	2+1	4	EE-223	⚠️
5	STAT-222	Advance Statistics	2+1	4		
6	CS-3XX	DS Elective-I	2+1			
7		Total CHs	13+5			

			Semester-5			
No	Code	Title	Credit Hours	Related SDG	Pre Requisite	Contents
1	MGT-164	Introduction To Management	2+0	4,8,9		
2	CS-333	Operating Systems	2+1	4		⚠️
3	DS-311	Data Mining	2+1	4,9		⚠️
4	CS-366	Data Visualization	2+1	4,9	COAL	

No	Code	Title	Credit Hours	Related SDG	Pre Requisite	Contents
5	CS-3XX	DS Elective-II	2+1			
6	CS-3XX	DS Elective-III	2+1			
7		Total CHs	12+5			

Semester-6						
No	Code	Title	Credit Hours	Related SDG	Pre Requisite	Contents
1	SE-200	Software Engineering	3+0	4,9,11,12	CS-212 Object Oriented Programming	⚠️
2	CS-347	Parallel and Distributed Computing	2+1	4,9		⚠️
3	DS-312	Data Warehousing and Business Intelligence	2+1	4,9		⚠️
4	CS-3XX	DS Elective-IV	2+1			
5	CS-3XX	DS Elective-V	2+1			
6	CS-3XX	DS Elective-VI	2+1			

7		CHs	13+5			

Semester-7						
No	**Code**	**Title**	**Credit Hours**	**Related SDG**	**Pre Requisite**	**Contents**
1	CS-251	Design & Analysis of Algorithms	3+0	4,9,11,12	CS-250	⚠️
2	HU-210	Technical Writing	3+0	4,8		
3	MGT-271	Entrepreneurship	2+0	4,8,9		⚠️
4	DS-498	Final Year Project-1	0+2	1 to 17		
5	CS-XXX	DS Elective-VII	2+1			
6		Total CHs	10+3			

Semester-8						
No	**Code**	**Title**	**Credit Hours**	**Related SDG**	**Pre Requisite**	**Contents**

No	Code	Title	Credit Hours	Related SDG	Pre Requisite	Contents
1	CCE-401	Civic and Community Engagement	1+1	4,11		⚠
2	HU-102	Psychology	3+0	3,4		⚠
3	HU-127	Ideology and Constitution of Pakistan.	2+0	1 to 17		⚠
4	HU-222	Professional Ethics	2+0	1,3,4,5,8,9,10,11,12,15,16,17		⚠
5	DS-499	Final Year Project-II	0+4	1 to 17	DS-498	
6		Total CHs	8+5			

		Internship				
No	Code	Title	Credit Hours	Related SDG	Pre Requisite	Contents
1	DS-488	Field Experience / Internship	0+3			
2		Grand Total	133			

For Pre-Medical Students Only (Semester-1)

No	Code	Title	Credit Hours	Related SDG	Pre Requisite	Contents
1	MATH-162	Pre-Mathematics I (in lieu of MATH-161)	3+0	4		⚠️
2	MATH-163	Pre-Mathematics-II	3+0			⚠️

For Pre-Medical Students Only (Semester-2)						
No	Code	Title	Credit Hours	Related SDG	Pre Requisite	Contents
1	MATH-101	Calculus & Analytical Geometry	3+0	4,8,9,16		⚠️
2	MATH-161	Discrete Mathematics	3+0	4,9		⚠️

For Pre-medical Students only (Summer Semester)						
No	Code	Title	Credit Hours	Related SDG	Pre Requisite	Contents
1	MATH-222	Linear Algebra	3+0	4	MATH-101	⚠️

| 2 | MATH-234 | Multivariable Calculus | 3+0 | 4,9 | MATH-101 | ⚠ |

List of Electives CS-417						
No	Code	Title	Credit Hours	Related SDG	Pre Requisite	Contents
1	CS-321	Advanced Database Systems	3+0	9		
2	CS-352	Theory of Automata and Formal Languages	3+0	4,9		⚠
3	CS-470	Machine Learning	3+0	9,11,12		
4	CS-471	Machine Learning	3+1	9		⚠
5	CS-472	Natural Language Processing	3+0	9		
6	CS-475	Computer Vision	3+0	9,11,12		
7	CS-490	Advanced Topics In Computing	3+0	9		⚠
8	SE-320	Formal Methods	3+0	4,9	SE-200	⚠

9	SE-315	Cloud Computing	2-1	4,9		⚠️
10	CS-404	Big Data Analytics	2-1	9		⚠️
11	CS-405	Deep Learning	3+1	9		⚠️
12	CS-416	Natural Language Processing	2+1			⚠️
13	CS-2XX	Machine Learning	2+1			⚠️
14	CS-419	Deep Learning	2+1			⚠️
15	CS-417	Artificial Neural Networks	3+0			
16	CS-418	Privacy Preservation	2+1			
17	CS-3XX	Artificial Neural Networks and Deep Learning	2+1			
18	CS-3XX	Business Process Analysis	2+1			

19	CS-3XX	Theory of Automata	2+1			
20	CS-3XX	HCI & Computer Graphics	2+1			
21	CS-3XX	Pltform & Architecture for DS	2+1			
22	CS-3XX	Text Mining	2+1			
23	CS-3XX	Topics in Data Science	2+1			
24	CS-3XX	Speech Processing	2+1			
25	CS-3XX	Data Mining	2+1			
26	CS-433	Digital Image Processing	3+1			
27	CS-344	Web Engineering	3+1			
28	CS-2XX	Web Engineering	2+1			
29	CS-3XX	Vistual & Augmented Reality	2+1			

30	CS-3XX	Computer Graphics	2+1			
31	CS-3XX	Digital Image Processing	2+1			
32	CS-4XX	Speech & Image Processing	2+1			