

1. BS Data Sciences (No. of University Common Courses & Credit Hours)

Requirements of Subjects and Credit Hours														
Faculty	Dept. Code	Foreign Language		Culture		Social Sciences		Management Sciences		Natural Sciences		Computing		Total Credit Hours
Faculty of Information & Computing Sciences	DS	No. of Courses	Credit Hours	No. of Courses	Credit Hours	No. of Courses	Credit Hours	No. of Courses	Credit Hours	No. of Courses	Credit Hours	No. of Courses	Credit Hours	
		3	6	2	4	5	12	1	2	5	16	1	3	43

2. List of University Common Courses (For Reference Purposes Only)

Course Code	Knowledge Area/Name of Subject	Theory	Lab	Prerequisites
Culture				
HS-1001	Islamic Studies/Ethics	2	0	
HS-1002	Pakistan Studies	2	0	
Foreign Language				
HS-1003	Functional English	2	0	
HS-1004	Communication Skills	2	0	
HS-x005	Technical Report Writing	2	0	
HS-1006	Chinese Language-I	2	0	
HS-1007	Chinese Language-II	2	0	
HS-1008	Chinese Language-III	2	0	
Social Sciences				
SS-x005	Introduction to Sociology	2	0	
SS-x006	Sociology for Engineers	2	0	
SS-x007	Social Psychology	2	0	
SS-x008	Introduction to Sociolinguistics	3	0	
SS-x009	Psychology and Human Behaviour	2	0	
SS-x010	Professional Psychology	2	0	
SS-x011	Organizational Behaviour	2	0	
SS-x012	Logical & Critical Thinking	2	0	
SS-x013	Introduction to Philosophy	2	0	
SS-x014	Professional Ethics	2	0	
SS-x015	Introduction to Economics	3	0	
SS-x016	Microeconomics	3	0	
SS-x017	Engineering Economics	3	0	
SS-x018	Research Methodology	3	0	
Natural Sciences				
NS-1001	Applied Physics	3	1	
NS-1002	Applied Chemistry	3	1	
NS-1003	Applied Geology	2	1	
NS-1004	Introduction to Environmental Microbiology	2	1	
NS-1005	Elements of Set Theory & Mathematical Logic	3	0	
NS-1006	Statistics	3	0	
NS-1007	Discrete Mathematics	3	0	
NS-1008	Calculus and Analytical Geometry	3	0	

NS-1009	Linear Algebra	3	0	Calculus and Analytical Geometry
NS-2010	Differential Equations	3	0	Calculus and Analytical Geometry
NS-2011	Complex Variable and Transforms	3	0	Differential Equations
NS-3012	Probability & Statistics	3	0	
NS-3013	Numerical Analysis & Computer Application	2	1	Differential Equations
Management Sciences				
MS-x601	Principles of Management	2	0	Offered to students not before Junior Year (Year 3)
MS-x602	Industrial Management	2	0	Offered to students not before Junior Year (Year 3)
MS-x603	Engineering Management	3	0	Offered to students not before Junior Year (Year 3)
MS-x604	Project Management	3	1	Offered to students not before Junior Year (Year 3)
MS-x605	Engineering Project Management	2	0	Offered to students not before Junior Year (Year 3)
MS-x606	Project Planning & Management	2	0	Offered to students not before Junior Year (Year 3)
MS-x607	Environment & Safety Management	3	0	Offered to students not before Junior Year (Year 3)
MS-x608	Quality Control	3	0	Offered to students not before Junior Year (Year 3)
MS-x609	Engineering Economics and Management	3	0	Offered to students not before Junior Year (Year 3)
MS-x610	Entrepreneurship	2	0	Offered to students not before Junior Year (Year 3)
MS-x611	Entrepreneurship and Marketing	3	0	Offered to students not before Junior Year (Year 3)
Computing				
IT-x501	Introduction to Information & Communication Technologies	2	1	
IT-x502	Computer Fundamentals & Programming	2	1	
IT-x503	Computer Programming	3	1	Introduction to Information & Communication Technologies
IT-x504	Computer Simulation	2	1	Computer Fundamentals & Programming
IT-x505	Numerical Methods & Software Applications	2	1	Computer Fundamentals & Programming
IT-x506	Modelling & Simulation	2	1	Computer Programming/Computer Fundamentals & Programming

3. BS Data Sciences Course Catalogue

Course Code	Knowledge Area/Name of Subject	Theory	Lab	Req. Courses	Req. CH	Prerequisites
Computing Core						
CS-1101	Programming Fundamentals	3	1	12	40	
CS-1102	Object Oriented Programming	3	1			Programming Fundamentals
CS-1103	Digital Logic Design	2	1			
CS-2104	Database Systems	3	1			
CS-2105	Data Structures	3	1			Object Oriented Programming
CS-2106	Information Security	2	1			
CS-2107	Artificial Intelligence	2	1			
CS-2108	Computer Networks	2	1			
CS-2109	Software Engineering	3	0			
CS-2110	Computer Organization & Assembly Language	2	1			Digital Logic Design
CS-3111	Operating Systems	2	1			
CS-4112	Analysis of Algorithms	3	0			Data Structures
Domain Core						
DS-2201	Introduction to Data Science	2	1	6	18	
DS-2202	Advanced Statistics	2	1			
DS-3203	Data Mining	2	1			
DS-3204	Data Visualization	2	1			
DS-3205	Data Warehousing & Business Intelligence	2	1			
DS-3206	Parallel & Distributed Computing	2	1			
Domain Elective						
DS-3301	Advanced Database Management Systems	3	0	7	21	
DS-3302	Big Data Analytics	3	0			
DS-3303	Machine Learning	3	0			
DS-3304	Artificial Neural Networks	3	0			
DS-3305	Human Computer Interaction	3	0			
DS-3306	Natural Language Processing	3	0			
DS-3307	Mobile Application Development	2	1			
DS-3308	Web Technologies	2	1			
DS-3309	Game Development	3	0			
DS-3310	Cyber Security	3	0			
DS-4311	Business Process Analysis	3	0			Offered in Final Year Only
DS-4312	Architecture of Data Science	3	0			Offered in Final Year Only
DS-4313	Visual Programming	3	0			Offered in Final Year Only
DS-4314	Digital Marketing	3	0			Offered in Final Year Only
DS-4315	Cloud Computing	3	0			Offered in Final Year Only
DS-4316	Game Design	3	0			Offered in Final Year Only
DS-4317	Digital Forensics	3	0			Offered in Final Year Only
DS-4318	Cyber Warfare	3	0			Offered in Final Year Only
DS-4319	Deep Learning	3	0			Offered in Final Year Only
Supporting Elective						
DS-3401	Computer Architecture	2	1	1	3	
DS-3402	Theory of Automata	3	0			
Final Year Project						
DS-4999	Final Year Project-I	0	3	1	6	Offered in Final Year Only
DS-4999	Final Year Project-II	0	3			Offered in Final Year Only