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

Sept Code Course Title Type Prerequisite Ordin hours -			Semeste	rl				
1	Sr#	Code	Course Title	Type	Prerequisite	Credit hours		
2	1	HO-001	Ouran with Translation			0.5		
3 Geol								
4 61-02 Pedictern Studies						_		
Section Introduction of Information and Communication Technologies CC 3.3		_						
Column				1		-		
	5	GE-103	Introduction to Information and Communication Technologies	GE		2-1		
	6	CC-101	Discrete Structures	CC		3		
First Code Course Title Type Prerequisite Credit hours Service Course Title Credit hours Service Credit hours Credit hours	7	CC-102	Programming Fundamentals	СС		3-1		
8		Semester II						
8	Sr#	Code	Course Title	Tyne	Prerequisite	Credit hours		
19					. rerequisite	_		
10	-				D 01 1 4	_		
11 6 2.01 Islamic Studies		_			Pre-Calculus-1			
12 6-105 Communication and Presentation Skills	10	MS101	Probability and Statistics	MS				
13 1.5 1.01 Digital Logic Design St Corporation St Corporation St St Corporation St St St St St St St S	11	GE-101	Islamic Studies	GE		2		
Semester Format	12	GE-105	Communication and Presentation Skills	GE	English Composition and Comprehension	3		
Semester	13	CS-101	Digital Logic Design	CS		3-1		
Semester	14	1		CC	Programming Fundamentals	3-1		
15	C#	Codo			Dunua sudaita	Cuadit harre		
MS MS Calculus and Analytical Geometry MS 3 3 3 3 3 3 3 3 3					Prerequisite			
17		-	-					
18 UE-2 University Elective (Economy Related)	-			1		_		
199 CC-205 Data Structures and Algorithms CC Programming Fundamentals 3-1	17	MS-202	Linear Algebra	MS		3		
CC Semester V	18	UE-2	University Elective (Economy Related)	UE		3		
CC C-203 Database Systems	19	CC-205	Data Structures and Algorithms	СС	Programming Fundamentals	3-1		
Semester N	20	CC-203	Datahase Systems	CC		3-1		
		00 200	•			<u> </u>		
21 HQ-004 Quran with Translation	C#	Code			Duna mailaita	Consulta la como		
22 MS-203 Oliferential Equations	-				Prerequisite	_		
23 CC-303 Software engineering	21	HQ-004	Quran with Translation					
24 CS-201 Computer Organization and Assembly Language CS Digital Logic Design 3-1	22	MS-203	Differential Equations	MS	Calculus and Analytical Geometry	3		
25 CS-203 Artificial Intelligence CS Object Oriented Programming 3-1	23	CC-303	Software engineering	CC		3		
DC Probability and Statistics 3 Semester V	24	CS-201	Computer Organization and Assembly Language	CS	Digital Logic Design	3-1		
DC Probability and Statistics 3 Semester V	25	CS-203	Artificial Intelligence	CS	Object Oriented Programming	3-1		
Semester V	-	_	-					
Srif Code Course Title Type Prerequisite Credit hours Course Title Type Prerequisite Credit hours Course Title Type Code Course Title Credit hours Course Title Credit hours Course Title Code Course Title Credit hours Course Title Code Course Title Credit hours Course Title Credit hours Course Title Code Course Title Credit hours Code Course Title Code Cod		D3 201			1 Tobability and Statistics	3		
27 HQ-005 Quran with Translation .	C#	Code		т —	Duna mailaita	Consider to account		
28					Prerequisite			
29 DS-3- Data Science Elective I				+		_		
30 CC-301 Operating Systems CC Data Structures and Algorithms 3-1	28	UE-3	University Elective (Foreign Language/Arabic Language)	UE		2		
31 DS-308 Data Visualization DC DC Data Structures and Algorithms 3 3 DS-302 Introduction to Data Science DC Type Prerequisite Credit hours 3 1 NS-302 NS-302 NS-302 NS-302 NS-302 NS-302 NS-302 NS-303 NS-304 Data Mining DC Advanced Statistics, Introduction to Data Science 2-1 NS-305 NS-304 Data Mining DC Advanced Statistics, Introduction to Data Science 2-1 NS-305 NS-304 Data Science Elective II DE NS-304 NS-305	29	DS-3	Data Science Elective I	DE		3		
32 CS-301 Analysis of Algorithms CS Data Structures and Algorithms 3 3 3 5 302 Introduction to Data Science DC Artificial Intelligence 2 - 1 Semester VI	30	CC-301	Operating Systems		Data Characteristics and Alexandria			
33 DS-302 Introduction to Data Science DC Artificial Intelligence 2-1	31	$\overline{}$		СС	Data Structures and Algorithms	3-1		
33 DS-302 Introduction to Data Science DC Artificial Intelligence 2-1	32	DS-308			Data Structures and Algorithms			
Semester VI			Data Visualization	DC	-	2-1		
Sr# Code Course Title Type Prerequisite Credit hours 34 HQ-006 Quran with Translation	33	CS-301	Data Visualization Analysis of Algorithms	DC CS	Data Structures and Algorithms	2-1		
HQ-006 Quran with Translation	33	CS-301	Data Visualization Analysis of Algorithms Introduction to Data Science	DC CS DC	Data Structures and Algorithms	2-1		
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 Semester VII Sr# Code Course Title Type Prerequisite Credit hours 40 HQ-007 Quran with Translation CC		CS-301 DS-302	Data Visualization Analysis of Algorithms Introduction to Data Science Semester	DC CS DC	Data Structures and Algorithms Artificial Intelligence	2-1 3 2-1		
DS-304 Data Mining	Sr#	CS-301 DS-302	Data Visualization Analysis of Algorithms Introduction to Data Science Semester Course Title	DC CS DC VI Type	Data Structures and Algorithms Artificial Intelligence	2-1 3 2-1 Credit hours		
37 DS-306 Data Warehousing and Business Intelligence DC Introduction to Data Science 2-1	Sr# 34	CS-301 DS-302 Code HQ-006	Data Visualization Analysis of Algorithms Introduction to Data Science Semester Course Title Quran with Translation	DC CS DC VI Type	Data Structures and Algorithms Artificial Intelligence	2-1 3 2-1 Credit hours		
38 DS-3 Data Science Elective II DE 3	Sr# 34	CS-301 DS-302 Code HQ-006	Data Visualization Analysis of Algorithms Introduction to Data Science Semester Course Title Quran with Translation	DC CS DC VI Type	Data Structures and Algorithms Artificial Intelligence	2-1 3 2-1 Credit hours 0.5		
38 DS-3 Data Science Elective II DE 3	Sr# 34 35	CS-301 DS-302 Code HQ-006 CC-305	Data Visualization Analysis of Algorithms Introduction to Data Science Semester Course Title Quran with Translation Computer Networks	DC CS DC VI Type CC	Data Structures and Algorithms Artificial Intelligence Prerequisite	2-1 3 2-1 Credit hours 0.5 3-1		
Semester VII Seme	Sr# 34 35 36	CS-301 DS-302 Code HQ-006 CC-305 DS-304	Data Visualization Analysis of Algorithms Introduction to Data Science Semester Course Title Quran with Translation Computer Networks Data Mining	CS DC VI Type CC DC	Data Structures and Algorithms Artificial Intelligence Prerequisite Advanced Statistics, Introduction to Data Science	2-1 3 2-1 Credit hours 0.5 3-1 2-1		
Semester VIISr#CodeCourse TitleTypePrerequisiteCredit hours40HQ-007Quran with Translation0.541CC-401Final Year Project-1CC242GE-401Technical and Business WritingGECommunication and Presentation Skills343UE-4-University Elective (Social Science Related)UE344CS-401Parallel and Distributed ComputingCSOperating Systems, Data Structures and Algorithms2-145DS-401Big Data AnalyticsDCData Warehousing and Business Intelligence2-146DS-4Data Science Elective IVDE3Semester VIIISr#CodeCourse TitleTypePrerequisiteCredit hours47HQ-008Quran with Translation0.548CC-402Final Year Project-2CCFinal Year Project-1449CC-403Information SecurityCC350UE-4University Elective (Management Related)UE351UE-4University Elective (Social Services)UE1	Sr# 34 35 36 37	CS-301 DS-302 Code HQ-006 CC-305 DS-304 DS-306	Data Visualization Analysis of Algorithms Introduction to Data Science Semester Course Title Quran with Translation Computer Networks Data Mining Data Warehousing and Business Intelligence	CS DC VI Type CC DC DC	Data Structures and Algorithms Artificial Intelligence Prerequisite Advanced Statistics, Introduction to Data Science	2-1 3 2-1 Credit hours 0.5 3-1 2-1 2-1		
Sr#CodeCourse TitleTypePrerequisiteCredit hours40HQ-007Quran with Translation0.541CC-401Final Year Project-1CC242GE-401Technical and Business WritingGECommunication and Presentation Skills343UE-4University Elective (Social Science Related)UE344CS-401Parallel and Distributed ComputingCSOperating Systems, Data Structures and Algorithms2-145DS-401Big Data AnalyticsDCData Warehousing and Business Intelligence2-146DS-4Data Science Elective IVDE3Semester VIIISr#CodeCourse TitleTypePrerequisiteCredit hours47HQ-008Quran with Translation0.548CC-402Final Year Project-2CCFinal Year Project-1449CC-403Information SecurityCC350UE-4University Elective (Management Related)UE351UE-4University Elective (Social Services)UE1	Sr# 34 35 36 37 38	CS-301 DS-302 Code HQ-006 CC-305 DS-304 DS-306 DS-3	Data Visualization Analysis of Algorithms Introduction to Data Science Semester Course Title Quran with Translation Computer Networks Data Mining Data Warehousing and Business Intelligence Data Science Elective II	DC CS DC VI Type CC DC DC DC	Data Structures and Algorithms Artificial Intelligence Prerequisite Advanced Statistics, Introduction to Data Science	2-1 3 2-1 Credit hours 0.5 3-1 2-1 2-1 3		
40 HQ-007 Quran with Translation 0.5 41 CC-401 Final Year Project-1 CC 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	Sr# 34 35 36 37 38	CS-301 DS-302 Code HQ-006 CC-305 DS-304 DS-306 DS-3	Data Visualization Analysis of Algorithms Introduction to Data Science Semester Course Title Quran with Translation Computer Networks Data Mining Data Warehousing and Business Intelligence Data Science Elective II Data Science Elective III	DC CS DC VI Type CC DC DC DC DE	Data Structures and Algorithms Artificial Intelligence Prerequisite Advanced Statistics, Introduction to Data Science	2-1 3 2-1 Credit hours 0.5 3-1 2-1 2-1 3		
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	Sr# 34 35 36 37 38 39	CS-301 DS-302 Code HQ-006 CC-305 DS-304 DS-306 DS-3 DS-3	Data Visualization Analysis of Algorithms Introduction to Data Science Semester Course Title Quran with Translation Computer Networks Data Mining Data Warehousing and Business Intelligence Data Science Elective II Data Science Elective III Semester	DC CS DC VI Type CC DC DC DC DC DE DE VII	Data Structures and Algorithms Artificial Intelligence Prerequisite Advanced Statistics, Introduction to Data Science Introduction to Data Science	2-1 3 2-1 Credit hours 0.5 3-1 2-1 2-1 3 3		
42 GE-401 Technical and Business Writing 43 UE-4 University Elective (Social Science Related) 44 CS-401 Parallel and Distributed Computing 45 DS-401 Big Data Analytics 46 DS-4 Data Science Elective IV 47 Code 48 CC-402 Final Year Project-2 49 CC-403 Information Security 50 UE-4 University Elective (Management Related) 50 UE-4 University Elective (Social Services)	Sr# 34 35 36 37 38 39 Sr#	CS-301 DS-302 Code HQ-006 CC-305 DS-304 DS-306 DS-3 DS-3	Data Visualization Analysis of Algorithms Introduction to Data Science Course Title Quran with Translation Computer Networks Data Mining Data Warehousing and Business Intelligence Data Science Elective II Data Science Elective III Semester Course Title	DC CS DC VI Type CC DC DC DC DE DE VII Type	Data Structures and Algorithms Artificial Intelligence Prerequisite Advanced Statistics, Introduction to Data Science Introduction to Data Science	2-1 3 2-1 Credit hours 0.5 3-1 2-1 3 3		
43 UE-4 University Elective (Social Science Related) 44 CS-401 Parallel and Distributed Computing 45 DS-401 Big Data Analytics 46 DS-4 Data Science Elective IV 50 DE Semester VIII Sr# Code Course Title Type Prerequisite Credit hours 47 HQ-008 Quran with Translation 48 CC-402 Final Year Project-2 49 CC-403 Information Security 50 UE-4 University Elective (Management Related) 50 UE-4 University Elective (Social Services) UE 3 Operating Systems, Data Structures and Algorithms 2-1 DD Data Warehousing and Business Intelligence 2-1 3 Semester VIII Credit hours CC Final Year Project-1 4 University Elective (Management Related) UE 3 5 UE-4 University Elective (Social Services) UE 1	Sr# 34 35 36 37 38 39 Sr#	CS-301 DS-302 Code HQ-006 CC-305 DS-304 DS-3-0 DS-3 DS-3	Data Visualization Analysis of Algorithms Introduction to Data Science Course Title Quran with Translation Computer Networks Data Mining Data Warehousing and Business Intelligence Data Science Elective II Data Science Elective III Semester Course Title Quran with Translation	DC CS DC VI Type CC DC DC DC DE DE VII Type	Data Structures and Algorithms Artificial Intelligence Prerequisite Advanced Statistics, Introduction to Data Science Introduction to Data Science	2-1 3 2-1 Credit hours 0.5 3-1 2-1 3 3 Credit hours		
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 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 1 1	Sr# 34 35 36 37 38 39 Sr# 40	CS-301 DS-302 Code HQ-006 CC-305 DS-304 DS-3-0 DS-3 DS-3	Data Visualization Analysis of Algorithms Introduction to Data Science Course Title Quran with Translation Computer Networks Data Mining Data Warehousing and Business Intelligence Data Science Elective II Data Science Elective III Semester Course Title Quran with Translation	DC CS DC VI Type CC DC DC DC DE DE VII Type	Data Structures and Algorithms Artificial Intelligence Prerequisite Advanced Statistics, Introduction to Data Science Introduction to Data Science	2-1 3 2-1 Credit hours 0.5 3-1 2-1 3 3 Credit hours		
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 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 1 1	Sr# 34 35 36 37 38 39 Sr# 40 41	CS-301 DS-302 Code HQ-006 CC-305 DS-304 DS-306 DS-3 DS-3 Code HQ-007 CC-401	Data Visualization Analysis of Algorithms Introduction to Data Science Course Title Quran with Translation Computer Networks Data Mining Data Warehousing and Business Intelligence Data Science Elective II Data Science Elective III Semester Course Title Quran with Translation Final Year Project-1	DC CS DC VI Type CC DC DC DE DE VII Type CC CC	Data Structures and Algorithms Artificial Intelligence Prerequisite Advanced Statistics, Introduction to Data Science Introduction to Data Science Prerequisite Prerequisite	2-1 3 2-1 Credit hours 0.5 3-1 2-1 3 3 Credit hours 0.5 2		
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	Sr# 34 35 36 37 38 39 Sr# 40 41 42	CS-301 DS-302 Code HQ-006 CC-305 DS-304 DS-306 DS-3 DS-3 Code HQ-007 CC-401 GE-401	Data Visualization Analysis of Algorithms Introduction to Data Science Course Title Quran with Translation Computer Networks Data Mining Data Warehousing and Business Intelligence Data Science Elective II Data Science Elective III Semester Course Title Quran with Translation Final Year Project-1 Technical and Business Writing	DC CS DC VI Type CC DC DC DE DE VII Type CC GE	Data Structures and Algorithms Artificial Intelligence Prerequisite Advanced Statistics, Introduction to Data Science Introduction to Data Science Prerequisite Prerequisite	2-1 3 2-1 Credit hours 0.5 3-1 2-1 3 3 Credit hours 0.5 2 3		
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	Sr# 34 35 36 37 38 39 Sr# 40 41 42 43	CS-301 DS-302 Code HQ-006 CC-305 DS-304 DS-306 DS-3 DS-3 Code HQ-007 CC-401 GE-401 UE-4	Data Visualization Analysis of Algorithms Introduction to Data Science Course Title Quran with Translation Computer Networks Data Mining Data Warehousing and Business Intelligence Data Science Elective II Data Science Elective III Semester Course Title Quran with Translation Final Year Project-1 Technical and Business Writing University Elective (Social Science Related)	DC CS DC VI Type CC DC DE DE VII Type CC GE UE	Data Structures and Algorithms Artificial Intelligence Prerequisite Advanced Statistics, Introduction to Data Science Introduction to Data Science Prerequisite Communication and Presentation Skills	2-1 3 2-1 Credit hours 0.5 3-1 2-1 3 3 Credit hours 0.5 2 3 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	Sr# 34 35 36 37 38 39 Sr# 40 41 42 43	CS-301 DS-302 HQ-006 CC-305 DS-304 DS-306 DS-3 DS-3 Code HQ-007 CC-401 GE-401 UE-4 CS-401	Data Visualization Analysis of Algorithms Introduction to Data Science Course Title Quran with Translation Computer Networks Data Mining Data Warehousing and Business Intelligence Data Science Elective II Data Science Elective III Semester Course Title Quran with Translation Final Year Project-1 Technical and Business Writing University Elective (Social Science Related) Parallel and Distributed Computing	DC CS DC VI Type CC DC DE DE VII Type CC GE UE CS	Data Structures and Algorithms Artificial Intelligence Prerequisite Advanced Statistics, Introduction to Data Science Introduction to Data Science Prerequisite Communication and Presentation Skills Operating Systems, Data Structures and Algorithms	2-1 3 2-1 Credit hours 0.5 3-1 2-1 3 3 Credit hours 0.5 2 3 3 3 2-1		
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	Sr# 34 35 36 37 38 39 Sr# 40 41 42 43 44	CS-301 DS-302 HQ-006 CC-305 DS-304 DS-306 DS-3 DS-3 Code HQ-007 CC-401 GE-401 UE-4 CS-401 DS-401	Data Visualization Analysis of Algorithms Introduction to Data Science Course Title Quran with Translation Computer Networks Data Mining Data Warehousing and Business Intelligence Data Science Elective II Data Science Elective III Semester Course Title Quran with Translation Final Year Project-1 Technical and Business Writing University Elective (Social Science Related) Parallel and Distributed Computing Big Data Analytics	DC CS DC VI Type CC DC DE DE VII Type CC GE UE CS DC	Data Structures and Algorithms Artificial Intelligence Prerequisite Advanced Statistics, Introduction to Data Science Introduction to Data Science Prerequisite Communication and Presentation Skills Operating Systems, Data Structures and Algorithms	2-1 3 2-1 Credit hours 0.5 3-1 2-1 3 3 Credit hours 0.5 2 3 3 2-1 2-1		
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	Sr# 34 35 36 37 38 39 Sr# 40 41 42 43 44	CS-301 DS-302 HQ-006 CC-305 DS-304 DS-306 DS-3 DS-3 Code HQ-007 CC-401 GE-401 UE-4 CS-401 DS-401	Data Visualization Analysis of Algorithms Introduction to Data Science Course Title Quran with Translation Computer Networks Data Mining Data Warehousing and Business Intelligence Data Science Elective II Data Science Elective III Semester Course Title Quran with Translation Final Year Project-1 Technical and Business Writing University Elective (Social Science Related) Parallel and Distributed Computing Big Data Analytics Data Science Elective IV	DC CS DC VI Type CC DC DE DE VI Type CC CC DE DE DE VI Type CC GE UE CS DC	Data Structures and Algorithms Artificial Intelligence Prerequisite Advanced Statistics, Introduction to Data Science Introduction to Data Science Prerequisite Communication and Presentation Skills Operating Systems, Data Structures and Algorithms	2-1 3 2-1 Credit hours 0.5 3-1 2-1 3 3 Credit hours 0.5 2 3 3 2-1 2-1		
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	Sr# 34 35 36 37 38 39 Sr# 40 41 42 43 44 45 46	CS-301 DS-302 Code HQ-006 CC-305 DS-304 DS-306 DS-3 DS-3 Code HQ-007 CC-401 GE-401 UE-4 CS-401 DS-401 DS-4	Data Visualization Analysis of Algorithms Introduction to Data Science Course Title Quran with Translation Computer Networks Data Mining Data Warehousing and Business Intelligence Data Science Elective II Data Science Elective III Course Title Quran with Translation Final Year Project-1 Technical and Business Writing University Elective (Social Science Related) Parallel and Distributed Computing Big Data Analytics Data Science Elective IV Semester	DC CS DC VI Type CC DC DE DE VI Type CC CC DE DE DE VI Type CC GE UE CS DC	Data Structures and Algorithms Artificial Intelligence Prerequisite Advanced Statistics, Introduction to Data Science Introduction to Data Science Prerequisite Communication and Presentation Skills Operating Systems, Data Structures and Algorithms Data Warehousing and Business Intelligence	2-1 3 2-1 Credit hours 0.5 3-1 2-1 3 3 3 Credit hours 0.5 2 3 3 2-1 2-1 3		
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	Sr# 34 35 36 37 38 39 Sr# 40 41 42 43 44 45 46	CS-301 DS-302 Code HQ-006 CC-305 DS-304 DS-306 DS-3 DS-3 Code HQ-007 CC-401 GE-401 UE-4 CS-401 DS-401 DS-4	Data Visualization Analysis of Algorithms Introduction to Data Science Course Title Quran with Translation Computer Networks Data Mining Data Warehousing and Business Intelligence Data Science Elective II Data Science Elective III Course Title Quran with Translation Final Year Project-1 Technical and Business Writing University Elective (Social Science Related) Parallel and Distributed Computing Big Data Analytics Data Science Elective IV Semester	DC CS DC VI Type CC DC DE DE VII Type CC DE DE OC DE OC DE OC	Data Structures and Algorithms Artificial Intelligence Prerequisite Advanced Statistics, Introduction to Data Science Introduction to Data Science Prerequisite Communication and Presentation Skills Operating Systems, Data Structures and Algorithms Data Warehousing and Business Intelligence	2-1 3 2-1 Credit hours 0.5 3-1 2-1 3 3 3 Credit hours 0.5 2 3 3 2-1 2-1 3		
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	Sr# 34 35 36 37 38 39 Sr# 40 41 42 43 44 45 46 Sr#	CS-301 DS-302 Code HQ-006 CC-305 DS-304 DS-306 DS-3 DS-3 Code HQ-007 CC-401 GE-401 UE-4 CS-401 DS-401 DS-4	Data Visualization Analysis of Algorithms Introduction to Data Science Course Title Quran with Translation Computer Networks Data Mining Data Warehousing and Business Intelligence Data Science Elective II Data Science Elective III Semester Course Title Quran with Translation Final Year Project-1 Technical and Business Writing University Elective (Social Science Related) Parallel and Distributed Computing Big Data Analytics Data Science Elective IV Semester Course Title	DC CS DC VI Type CC DC DE DE VII Type CC DE DE OC DE OC DE OC	Data Structures and Algorithms Artificial Intelligence Prerequisite Advanced Statistics, Introduction to Data Science Introduction to Data Science Prerequisite Communication and Presentation Skills Operating Systems, Data Structures and Algorithms Data Warehousing and Business Intelligence	2-1 3 2-1 Credit hours 0.5 3-1 2-1 3 3 3 Credit hours 0.5 2 3 3 2-1 2-1 3 Credit hours		
50 UE-4 University Elective (Management Related) UE 3 51 UE-4 University Elective (Social Services) UE 1	\$r# 34 35 36 37 38 39 \$r# 40 41 42 43 44 45 46 \$r# 47	CS-301 DS-302 Code HQ-006 CC-305 DS-304 DS-306 DS-3 DS-3 Code HQ-007 CC-401 GE-401 UE-4 CS-401 DS-401 DS-4 COde HQ-008	Data Visualization Analysis of Algorithms Introduction to Data Science Course Title Quran with Translation Computer Networks Data Mining Data Warehousing and Business Intelligence Data Science Elective II Data Science Elective III Data Science Elective III Quran with Translation Final Year Project-1 Technical and Business Writing University Elective (Social Science Related) Parallel and Distributed Computing Big Data Analytics Data Science Elective IV Semester Course Title Quran with Translation	DC CS DC VI Type CC DC DE DE VII Type CC GE UE CS DC DC DE UE CS DC DC DC Type CC GE UE CS DC	Data Structures and Algorithms Artificial Intelligence Prerequisite Advanced Statistics, Introduction to Data Science Introduction to Data Science Prerequisite Communication and Presentation Skills Operating Systems, Data Structures and Algorithms Data Warehousing and Business Intelligence Prerequisite	2-1 3 2-1 Credit hours 0.5 3-1 2-1 3 3 3 Credit hours 0.5 2 3 3 2-1 2-1 3 Credit hours 0.5		
51 UE-4 University Elective (Social Services) UE 1	\$r# 34 35 36 37 38 39 \$r# 40 41 42 43 44 45 46 \$r# 47	CS-301 DS-302 Code HQ-006 CC-305 DS-304 DS-306 DS-3 DS-3 Code HQ-007 CC-401 GE-401 UE-4 CS-401 DS-401 DS-4 CG-401 COde HQ-008 CC-402	Data Visualization Analysis of Algorithms Introduction to Data Science Course Title Quran with Translation Computer Networks Data Mining Data Warehousing and Business Intelligence Data Science Elective II Data Science Elective III Semester Course Title Quran with Translation Final Year Project-1 Technical and Business Writing University Elective (Social Science Related) Parallel and Distributed Computing Big Data Analytics Data Science Elective IV Semester Course Title Quran with Translation Final Year Project-2	DC CS DC VI Type CC DC DE DE VII Type CC GE UE CS DC DC DC CS CC	Data Structures and Algorithms Artificial Intelligence Prerequisite Advanced Statistics, Introduction to Data Science Introduction to Data Science Prerequisite Communication and Presentation Skills Operating Systems, Data Structures and Algorithms Data Warehousing and Business Intelligence Prerequisite	2-1 3 2-1 Credit hours 0.5 3-1 2-1 3 3 3 Credit hours 0.5 2 3 3 2-1 2-1 3 Credit hours 0.5 4		
	\$r# 34 35 36 37 38 39 \$r# 40 41 42 43 44 45 46 \$r# 47	CS-301 DS-302 Code HQ-006 CC-305 DS-304 DS-3-0 DS-3 DS-3 Code HQ-007 CC-401 GE-401 UE-4 CS-401 DS-4-1 DS-4-1 Code HQ-008 CC-402 CC-403	Data Visualization Analysis of Algorithms Introduction to Data Science Course Title Quran with Translation Computer Networks Data Mining Data Warehousing and Business Intelligence Data Science Elective II Data Science Elective III Semester Course Title Quran with Translation Final Year Project-1 Technical and Business Writing University Elective (Social Science Related) Parallel and Distributed Computing Big Data Analytics Data Science Elective IV Semester Course Title Quran with Translation Final Year Project-2 Information Security	DC CS DC VI Type CC DC DE DE VII Type CC GE UE CS DC DC CC CC CC	Data Structures and Algorithms Artificial Intelligence Prerequisite Advanced Statistics, Introduction to Data Science Introduction to Data Science Prerequisite Communication and Presentation Skills Operating Systems, Data Structures and Algorithms Data Warehousing and Business Intelligence Prerequisite	2-1 3 2-1 Credit hours 0.5 3-1 2-1 3 3 3 Credit hours 0.5 2 3 3 2-1 2-1 3 Credit hours 0.5 4 3		
52 GE-402 Professional Practices GE 3	\$r# 34 35 36 37 38 39 \$r# 40 41 42 43 44 45 46 \$r# 47 48 49 50	CS-301 DS-302 Code HQ-006 CC-305 DS-304 DS-3-6 DS-3 DS-3 Code HQ-007 CC-401 GE-401 UE-4 CS-401 DS-401 DS-4 Code HQ-008 CC-402 CC-403 UE-4	Data Visualization Analysis of Algorithms Introduction to Data Science Course Title Quran with Translation Computer Networks Data Mining Data Warehousing and Business Intelligence Data Science Elective II Data Science Elective III Semester Course Title Quran with Translation Final Year Project-1 Technical and Business Writing University Elective (Social Science Related) Parallel and Distributed Computing Big Data Analytics Data Science Elective IV Semester Course Title Quran with Translation Final Year Project-2 Information Security University Elective (Management Related)	DC CS DC VI Type CC DC DE DE VII Type CC GE UE CS DC CC CC UE	Data Structures and Algorithms Artificial Intelligence Prerequisite Advanced Statistics, Introduction to Data Science Introduction to Data Science Prerequisite Communication and Presentation Skills Operating Systems, Data Structures and Algorithms Data Warehousing and Business Intelligence Prerequisite	2-1 3 2-1 Credit hours 0.5 3-1 2-1 3 3 Credit hours 0.5 2 3 3 2-1 2-1 3 Credit hours 0.5 4 3 3		
	\$r# 34 35 36 37 38 39 \$r# 40 41 42 43 44 45 46 \$r# 47 48 49 50 51	CS-301 DS-302 Code HQ-006 CC-305 DS-304 DS-3-6 DS-3 DS-3 DS-3 CC-401 GE-401 UE-4 CS-401 DS-401 DS-401 DS-4 COde HQ-008 CC-402 CC-403 UE-4 UE-4	Data Visualization Analysis of Algorithms Introduction to Data Science Course Title Quran with Translation Computer Networks Data Mining Data Warehousing and Business Intelligence Data Science Elective II Data Science Elective III Semester Course Title Quran with Translation Final Year Project-1 Technical and Business Writing University Elective (Social Science Related) Parallel and Distributed Computing Big Data Analytics Data Science Elective IV Semester Course Title Quran with Translation Final Year Project-2 Information Security University Elective (Management Related) University Elective (Management Related)	DC CS DC	Data Structures and Algorithms Artificial Intelligence Prerequisite Advanced Statistics, Introduction to Data Science Introduction to Data Science Prerequisite Communication and Presentation Skills Operating Systems, Data Structures and Algorithms Data Warehousing and Business Intelligence Prerequisite	2-1 3 2-1 Credit hours 0.5 3-1 2-1 3 3 Credit hours 0.5 2 3 3 2-1 2-1 3 Credit hours 0.5 4 3 3 1		