

BS Mathematics
Specializations with Data Science, Artificial Intelligence and Information Technology

Year 1

Semester 1				Semester 2			
Course No	Subject	Credit Hours		Course No	Subject	Credit Hours	
		Th	Pr			Th	Pr
MATH-101	Calculus-I	3	0	MATH-104	Calculus-II	3	0
MA-154	Quantitative Reasoning-I	3	0	MATH-105	Statistics	3	0
CSC-100 & 100L	Applications of Information and Communication Technologies	2	1	HU-214 / MGT-105	Psychology / Introduction to Economics	2	0
HU-111	Communication Skills	3	0	CSC-102&102L	Programming Fundamentals	3	1
IS-104	Islamic Studies/ Ethics for Non-Muslims	2	0	HU-200	Technical Report Writing	3	0
PHYS-101 & 101L	Mechanics	3	1	IS-111	Pakistan Studies	2	0
				IS-109L/IS-212L	Fehm - e – Quran – I/ Social Ethics-I	1	0

Year 2

Semester 3				Semester 4			
Course No	Subject	Credit Hours		Course No	Subject	Credit Hours	
		Th	Pr			Th	Pr
MATH-201	Calculus-III	3	0	MATH-205	Ordinary Differential Equations	3	0
CSC-103&103L	Object Oriented Programming	3	1	MATH-206	Discrete Mathematics	3	0
MATH-204	Linear Algebra	3	0	MATH-211	Operation Research-I	3	0
MA-259	Quantitative Reasoning-II	3	0	CSC-200 & 200L	Data Structures and Algorithms	3	1
PHYS-201 & 201L	Waves and Oscillations	3	1	PHYS-202	Heat and Thermodynamics	3	0
				IS-203	Ideology and Constitution of Pakistan	2	0

Year 3

Semester 5				Semester 6			
Course No	Subject	Credit Hours		Course No	Subject	Credit Hours	
		Th	Pr			Th	Pr
MATH-301	Real Analysis-I	3	0	MATH-307	Classical Mechanics	3	0
MATH-302	Vector and Tensor Analysis	3	0	MATH-308	Partial Differential Equations	3	0
MATH-303	Probability	3	0	MATH-309	Complex Analysis	3	0
MATH-304	Topology	3	0	MATH-311	Real Analysis-II	3	0
MATH-441	Functional Analysis	3	0	MGT-349	Entrepreneurship	2	0
CSC-202 & 202L	Artificial Intelligence	2	1		Elective -1	3	0
				IS-209L/IS-213L	Fehm - e – Quran – III/ Social Ethics-II	1	0
				MATH-312	Internship *	0	0

* Six to Eight Week Internship will be compulsory for degree requirement.

Year 4 (Applied Mathematics)

Semester 7				Semester 8			
Course No	Subject	Credit Hours		Course No	Subject	Credit Hours	
		Th	Pr			Th	Pr
MATH-401	Numerical Analysis	3	0	MATH-404	Fluid Mechanics-II	3	0
MATH-402	Fluid Mechanics-I	3	0	MATH-405	Integral Equations	3	0
MATH-403	Mathematical Physics	3	0		Elective – 4	3	0
	Elective -2	3	0	MATH-460	Project	3	0
	Elective -3	3	0	HU-204	Any Foreign Language	1	0
				HU-212	Civics and Community Engagement	2	0

***Elective Courses for Data Science, Artificial Intelligence and Information Technology**

Data Science	Artificial Intelligence	Information Technology
DS370 Data Mining	CSC-351 Machine Learning	CSC-415 Web Technologies
DS 371 Data Visualization	CSC-104 Database Systems	CSC-203 Computer Networks
DS-377 Artificial Neural Networks and Deep Learning	CSC-354 Computer Vision and Image Processing	CSC-204 Software Program Management
CSC-370 Fundamentals of Cyber Security	CSC-422 Management Information Systems	CSC-410 Mobile Application Development
CSC-354 Computer Vision and Image Processing	CSC-451 Natural Language Process	CSC-413 E-Commerce
CSC-422 Management Information Systems	DS-377 Artificial Neural Networks and Deep Learning	CSC-414 Enterprise Application Development
CSC-481 Cloud Computing	CSC-201 Information Security	CSC-422 Management Information Systems
MATH-312 Operation Research-II	MATH-312 Operation Research-II	MATH-312 Operation Research-II