

**Five Year Integrated M Sc – Data Science**

Course Code	Course Title	L T P	Cr	Course Code	Course Title	L T P	Cr
<b>SEMESTER 1</b>				<b>SEMESTER 2</b>			
18ENG101	Communicative English	2 0 2	3	18ENG121	Professional Communication	1 0 2	2
	Language Paper I	1 0 2	2		Language Paper II	1 0 2	2
18MAT101	Calculus	3 1 0	4	18MAT115	Vector Calculus	3 1 0	4
18MAT104	Linear Algebra	3 1 0	4	18MAT112	Discrete Mathematics	3 0 2	4
18PHY101	Physics	3 0 0	3	18CSE116	Advanced Computer Programming	3 0 0	3
18CSE100	Problem Solving and Computer Programming	3 0 0	3	18CSE117	Digital Electronics	3 0 0	3
18CSE180	Problem solving computer Programming Lab.	0 0 2	1	18CSE181	Advanced Computer Programming Lab.	0 0 2	1
18PHY181	Physics Lab	0 0 2	1	18CSE185	Digital Electronics Lab	0 0 2	1
18CUL101	Cultural Education I	2 0 0	2	18CUL111	Cultural Education II	2 0 0	2
	TOTAL		<b>23</b>		TOTAL		<b>22</b>
<b>SEMESTER 3</b>				<b>SEMESTER 4</b>			
18CSC201	Data Structures	3 1 0	4	18MAT 241	Statistical Inference Theory	3 0 0	3
18MAT231	Optimization Techniques	3 1 0	4	18MAT242	Introduction to Modern Algebra	3 0 0	3
18MAT232	Probability Theory	3 1 0	4	18CSC211	Convex Optimization	3 0 0	3
18MAT 233	Numerical Methods	3 1 0	4	18CSC212	Design and Analysis of Algorithms	3 1 0	4
18CSC202	Foundations of Data Science	2 0 2	3	18CSC213	Database Management Systems	3 1 0	4
18ENV300	Environmental Science and Sustainability	3 0 0	3		Open Elective A*	3 0 0	3
18MAT288	Data Science Lab-I: Statistics and Numerical Methods Lab	0 0 2	1	18MAT289	Data Science Lab-II: Inference Theory	0 0 2	1
18AVP201	Amrita Values Programme I	1 0 0	1	18SSK201	Life Skills I	1 0 2	2
18CSC281	Data Structures lab	0 0 2	1	18CSC202	Design and Analysis of AlgorithmsLab	0 0 2	1
				18AVP202	Amrita Values Programme II	1 0 0	1
	TOTAL		<b>25</b>		TOTAL		<b>25</b>
<b>SEMESTER 5</b>				<b>SEMESTER 6</b>			
18CSC301	Operating Systems	3 0 2	4	18MAT333	Graph Analytics and Algorithms	3 0 2	4
18MAT331	Transform Techniques	3 0 0	3	18MAT334	Regression Analysis	3 1 0	4
18CSC302	Number Theory and Information Security	3 1 0	4	18CSC311	Machine Learning	3 1 0	4
18MAT332	Random Process	3 0 0	3	18CSC312	Data Visualization	3 0 2	4
18CSC303	Database Design	3 1 0	4	18CSC313	Theory of Computation	3 1 0	4
18MAT390	Live-in-Lab.® / Open Elective B*	3 0 0	3	18CSC383	Machine Learning-Lab	0 0 2	1
	Life Skills II	1 0 2	2		Life Skills III	1 0 2	2
18CSC381	DBMS Lab	0 0 2	1	18CSC314	Ethics for Data Scientist	1 0 0	1
18CSC382	Open Lab-I (JAVA / C / C++ / R programming / Azure ...)	0 0 2	1	18CSC383	Open Lab II (Algorithms.io / Hadoop / Cascading / web design...)	0 0 2	1
	TOTAL		<b>25</b>		TOTAL		<b>25</b>
<b>SEMESTER 7</b>				<b>SEMESTER 8</b>			
18CSC401	Parallel and Distributed Systems	3 1 0	4	18CSC406	Software Engineering	3 1 0	4
18CSC402	Deep Learning	3 0 2	4	18CSC407	Deep Learning for Natural Language Processing	3 0 2	4
18CSC403	Practical Techniques for Big Data Processing	3 0 2	4		Elective III	3 0 0	3
18CSC404	Reinforcement Learning	3 0 0	3		Elective IV	3 0 0	3
18CSC405	Data Security	3 0 0	3		Elective V	3 0 0	3
	Elective I	3 0 0	3	18CSC483	Mini Project		5

	Elective II	3 0 0	3						
18CSC481	Open Lab-III	0 0 2	1						
TOTAL				25	TOTAL				23
<b>SEMESTER 9</b>				<b>SEMESTER 10</b>					
18CSC581	Project -I (Internship in Industries / Universities)		8	18CSC582	Project-II (Research based) Dissertation			12	
	Elective VI	3 0 0	3						
	Elective VII	3 0 0	3						
Total				14	TOTAL				12
<b>MATHEMATICS STREAM</b>				<b>Total Credits 219</b>					
<b>18MAT 441</b>				<b>COMPUTER SCIENCE STREAM</b>					
	Advanced Algebra	3 0 0	3	18CSC441	Soft Computing	3 0 0	3		
18MAT442	Advanced Big Data Analytics	3 0 0	3	18CSC442	Cryptography	3 0 0	3		
18MAT443	Differential Equations	3 0 0	3	18CSC443	Business Analytics	3 0 0	3		
18MAT444	Multivariate Statistics and Time Series Analysis	3 0 0	3	18CSC444	Deep Learning for Image Processing	3 0 0	3		
18MAT445	Wavelets	3 0 0	3	18CSC445	Predictive Analytics	3 0 0	3		
18MAT446	Computational Geometry	3 0 0	3	18CSC446	Mining of Massive Datasets	3 0 0	3		
18MAT447	Queuing Theory and Inventory Control Theory	3 0 0	3	18CSC447	Data Compression	3 0 0	3		
18MAT448	Theory of Sampling and Design of Experiments for Data Analysis	3 0 0	3	18CSC448	Computer Networks	3 0 0	3		
18MAT449	Computational Financial Mathematics	3 0 0	3	18CSC449	IoT (workshop based course)	3 0 0	3		
18MAT450	Data Analytics in Computational Biology	3 0 0	3	18CSC450	Introduction to Embedded Systems	3 0 0	3		
18MAT451	Computer Aided Drug Designing	3 0 0	3	18CSC451	Information retrieval (NL)	3 0 0	3		
18MAT452	Statistical Quality Control	3 0 0	3	18CSC452	Social Network Analytics	3 0 0	3		
18MAT453	Six Sigma Analysis	3 0 0	3	18CSC453	Big Data Storage and Anaysis	3 0 0	3		
18MAT454	Statistical Pattern Recognition	3 0 0	3	18CSC454	Probabilistic Graphical Models	3 0 0	3		

LANGUAGES										
Paper I					Paper II					
15HIN101	Hindi I	1 0 2	2	B	15HIN111	Hindi II	1 0 2	2	B	
15KAN101	Kannada I	1 0 2	2	B	15KAN111	Kannada II	1 0 2	2	B	
15MAL101	Malayalam I	1 0 2	2	B	15MAL111	Malayalam II	1 0 2	2	B	
15SAN101	Sanskrit I	1 0 2	2	B	15SAN111	Sanskrit II	1 0 2	2	B	