

Curriculum for BS Programme in Data Science & Engineering				
Sem	Course No.	Course Name	Credits	Total
I	BIO 101 Or ECO 101*	Biology I: Biomolecules Or Principles of Economics I	3	19
	BIO 103	General Biology Laboratory	1	
	CHM 101	General Chemistry	3	
	EES 101	Earth Materials and Processes	3	
	HSS 101	English for Communication	2	
	MTH 102	Linear Algebra	3	
	PHY 101	Mechanics	3	
	PHY 103	General Physics Laboratory I	1	
	PT 101	Physical Training	0	
II	BIO 102 Or ECO 102*	Biology II: Fundamentals of Cell Biology Or Principles of Economics I	3	19
	CHM 112	Basic Organic Chemistry	3	
	CHM 114	Chemistry Laboratory I	1	
	EES 102	Introduction to Environmental Sciences	3	
	ECS 102	Introduction to Programming	3	
	MTH 101	Calculus of One Variable	3	
	PHY 106	Quantum Physics	3	
*Students must either do both BIO101 and BIO102 in their 1st year, or both ECO101 and ECO102				
III	ECS 201	Discrete Mathematics -I	3	19
	ECO 201	Econometrics-I	4	
	MTH 201	Multivariable Calculus	3	

	*** **	3 Open Electives	3*3=9	
IV	ECS 202	Data Structure and Algorithms	3	18
	ECS 204	Signals And Systems	3	
	MTH 202	Probability and Statistics	3	
	*** **	3 Open Electives	3*3=9	
V	DSE 310	Fundamentals of Database systems	4	20
	DSE 312	Computer Vision	4	
	DSE 315	Data Science in Practise	4	
	DSE 317	Machine Learning	4	
	*** **	Open elective	4	
VI	DSE 304	Algorithms	4	20
	DSE 311	Applied Optimization	4	
	DSE 313	Artificial Intelligence	4	
	DSE 316	Deep Learning	4	
	*** **	Open elective	4	
VII	DSE ***	DSE courses at 400 level (3 courses)	3 *4=12	24
	*** **	Open electives (3 courses)	3*4=12	
VIII	DSE 400	Project work	18	18
Curriculum for additional one year to obtain BS-MS				
IX	#ECO 500	Law Related to Intellectual Property and Patents	1	19
	DSE ***	DSE courses (2 courses)	2*4 = 8	
	DSE 501	MS Thesis	10	
X	DSE 502	MS Thesis	20	20

Minor in DSE: Students must take 18 credits of DSE courses.
Currently, there are no mandatory DSE courses for **minors**.

#ECO 500 can be taken in any semester throughout the program.

List of non-exhaustive electives

Course no	Title
ECO 307 / DSE 305	Game Theory
MTH 308/DSE 306	Combinatorics and Graph Theory
HSS 322 / DSE 308	Computational Linguistics
BIO 402/DSE 402	Bioinformatics
BIO 407/DSE 401	Biostatistics
EES 407 / DSE 405	Data Analysis and Statistics for Geosciences
DSE 404	Network Science: Theory and Applications
DSE 406/606	Spatial Data Science and Applications
DSE 407/607	Natural Language Processing
DSE 410/ 610	Transfer Learning in Computer Vision
DSE 412/612	Machine Learning for BioPharma
DSE 314	Reinforcement Learning
DSE 303/ ECO 305	Econometrics II
DSE 409/609	Digital Image Processing and Applications in Bioimage Analysis
DSE 418/618	Advanced Natural Language Processing
DSE 420/620	Biomedical Text Mining
DSE 422/622	Biometrics: An Introduction to Research
DSE 421/621	Signal Processing for Machine Learning
DSE 333/533	Internet of Things
DSE 411/611	3D Deep Learning and Applications
DSE 613	Advanced Deep Learning