

Manipal Institute of Technology, Manipal
Course Structure for B. Tech (Data Science & Engineering) Program from Academic Session 2020-2021

Year	FIRST SEMESTER						SECOND SEMESTER					
	Sub. Code	Subject Name	L	T	P	C	Sub. Code	Subject Name	L	T	P	C
I	MAT 1151	Engineering Mathematics - I	3	1	0	4	MAT 1251	Engineering Mathematics – II	3	1	0	4
	PHY 1051	Engineering Physics	2	1	0	3	CHM 1051	Engineering Chemistry	2	1	0	3
	CIE 1051	Mechanics of Solids	2	1	0	3	BIO 1051	Biology for Engineers	2	1	0	3
	ECE 1051	Basic Electronics	3	0	0	3	ELE 1051	Basic Electrical Technology	2	1	0	3
	MME 1051	Basic Mechanical Engineering	3	0	0	3	CSE 1051	Problem Solving Using Computers	2	1	0	3
	HUM 1051	Communication skills in English	1	0	3	2	CIE 1052	Environment Studies	1	0	3	2
	PHY 1061	Engineering Physics Lab	0	0	3	1	CHM 1061	Engineering Chemistry Lab	0	0	3	1
	MME 1061	Workshop Practice	0	0	3	1	CSE 1061	PSUC Lab	0	0	3	1
	MME 1161	Engineering Graphics - 1	1	0	2	2	MME 1261	Engineering Graphics - II	1	0	2	2
			15	3	11	22			13	5	11	22
	Total Contact Hours (L + T + P)		29				Total Contact Hours (L + T + P)		29			
	THIRD SEMESTER						FOURTH SEMESTER					
II	MAT 2157	Mathematical Foundations for Data Science-I	3	0	0	3	MAT 2213	Mathematical Foundations For Data Science-II	3	0	0	3
	HUM 2151	Finance & Econometrics	3	0	0	3	DSE 2252	Database Systems	3	1	0	4
	DSE 2151	Introduction to Data Analytics	3	0	0	3	DSE 2254	Machine Learning	3	1	0	4
	DSE 2153	Object Oriented Programing	3	1	0	4	DSE 2256	Design & Analysis of Algorithms	3	1	0	4
	DSE 2155	Data Structures	3	1	0	4	DSE 2258	Data Communications and Networks	3	0	0	3
	DSE 2157	Computer System Architecture	3	0	0	3	****	Open Elective – I	3	0	0	3
	DSE 2159	Data Analytics Lab	0	0	3	1	DSE 2260	Database Lab	0	0	3	1
	DSE 2161	Object Oriented Programming Lab	0	0	3	1	DSE 2262	Machine Learning Lab	0	0	3	1
	DSE 2163	Data Structures Lab	0	0	3	1	DSE 2264	Design & Analysis of Algorithms Lab	0	0	3	1
			18	2	9	23			18	3	9	24
	Total Contact Hours (L + T + P)		29				Total Contact Hours (L + T + P) + OE		30			
	FIFTH SEMESTER						SIXTH SEMESTER					
III	MAT 3151	Mathematical Foundations For Data Science-III	3	0	0	3	HUM 3252	Operations Research	3	0	0	3
	DSE 3151	Deep Learning	3	1	0	4	DSE 3252	Artificial Intelligence	3	1	0	4
	DSE 3153	Operating Systems	3	0	0	3	DSE 3254	Parallel Programming	3	1	0	4
	DSE 3155	Natural Language Processing	3	0	0	3	DSE 3256	Big Data Analytics	3	1	0	4
	DSE 3157	Cloud Computing	3	0	0	3	DSE 3258	Data Privacy & Security	3	0	0	3
	****	Open Elective – II	3	0	0	3	****	Open Elective – III	3	0	0	3
	DSE 3159	Deep Learning Lab	0	0	3	1	DSE 3260	Artificial Intelligence lab	0	0	3	1
	DSE 3161	Operating Systems Lab	0	0	3	1	DSE 3262	Parallel Programming Lab	0	0	3	1
	DSE 3163	Web Technologies Lab	0	1	3	2	DSE 3264	Big Data Analytics Lab	0	0	3	1
			18	2	9	23			18	3	9	24
	Total Contact Hours (L+T+P) + OE		29				Total Contact Hours (L + T + P) + OE		30			

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IV	SEVENTH SEMESTER					EIGHTH SEMESTER						
	Sub. Code	Subject Name	L	T	P	C	Sub. Code	Subject Name	L	T	P	C
	DSE****	Program Elective - I	3			3	DSE 4298	Industrial Training				2
	DSE****	Program Elective - II	3			3	DSE 4299	Project work/ Practice School				12
	DSE****	Program Elective - III	3			3						
	DSE****	Program Elective - IV	3			3						
	DSE****	Program Elective - V	3			3						
	****	Open Elective - IV	3			3						
			18			18						14
	Total Contact Hours (L + T + P) + OE		18			Total Contact Hours (L + T + P)		-				

PROGRAM ELECTIVES:

Sub. Code	Subject Name	Sub. Code	Subject Name
DSE 4151	Advanced Data Structures and Algorithms	DSE 4152	Software Engineering
DSE 4153	Block chain Technologies	DSE 4154	Internet of Things
DSE 4155	Quantum Computing	DSE 4156	Social Network Analysis
DSE 4157	Data Forensics	DSE 4158	Information Retrieval
DSE 4159	Soft Computing Techniques	DSE 4160	Enterprise Data Architecture
DSE 4161	Computer Vision	DSE 4162	Robotics & Automation
DSE 4163	Finance & Accounting	DSE 4164	Risk Analytics
DSE 4165	Financial Market Analytics	DSE 4166	Business & Economic Analytics
DSE 4167	Fundamentals of Business Analytics	DSE 4168	Digital Marketing
DSE 4169	Supply Chain Management	DSE 4170	Health Informatics
DSE 4171	Bioinformatics	DSE 4172	Medical Image Processing
DSE 4173	Biostatistics	DSE 4174	Algorithmic Trading
DSE 4175	Applied Econometrics		

PROGRAM ELECTIVE BASED MINOR SPECIALIZATION:

1. **Finance & Security Analytics** – DSE 4163, DSE 4164, DSE 4165, DSE 4166
2. **Business Analytics** – DSE 4163, DSE 4167, DSE 4168, DSE 4169
3. **Health Care Analytics** – DSE 4170, DSE 4171, DSE 4172, DSE 4173