Maulana Azad National Institute of Technology, Bhopal-462003

DEPARTMENT OF Mathematics, Bio-informatics & Compute Applications

SCHEME FOR B.Tech. and M.Tech. (Mathematics and Data Science)

(2021 admitted batch onwards)

First Year Credits (Cumulative) 45

THIRD SEMESTER:

Course Code	Course Name	Scheme of Studies Periods per week			Credits
		L	T	P	
HUM 251	Fundamentals of Entrepreneurship	3	-	-	3
MDS 211	Discrete Mathematics	3	-	-	3
MDS 212	Applications of Differential Equations	3	1	-	4
MDS 213	Computer Architecture & System Software	3	-	-	3
MDS 214	Data Structure	3	-	-	3
MDS 215	Object Oriented Programming C++	3	1	-	4
MDS 216	Programming Lab in C++	-	-	2	1
MDS 217	Data Structure Lab	-	-	2	1
MDS 218	Professional Practices	-	2	-	2
Total Hours = 26		18	**4**	**4**	**24**
Total Credits (Cumulative)					**69**
Additional Subject: - National Cadet Corps (NCC)					
NCC 251	National Cadet Corps III	**1**	**5**	**1**	**7**
Total Credits (Cumulative)					**11**

FOURTH SEMESTER:

Course Code	Course Name	Scheme of Studies Periods per week			Credits
		L	T	P	
ME 252	Fundamentals of Design	2	1	-	3
MDS 221	Probability & Statistics	2	1	-	3
MDS 222	Linear Algebra	3	-	-	3
MDS 223	Analysis and Design of Algorithms	3	1	-	4
MDS 224	Operating System	3	-	-	3
MDS 225	Computer Networks	3			3
MDS 226	Programming Lab in Python	-	-	2	1
MDS 227	Project Based Lab-1	-	-	2	1
MDS 228	Networking Lab	-	-	2	1
Total Hours = 25		**16**	**3**	**6**	**22**
Total Credits (Cumulative)					**91**
Additional Subject: - National Cadet Corps (NCC)					
NCC 252	National Cadet Corps IV	**2**	**-**	**1**	**3**
Total Credits (Cumulative)					**14**

FIFTH SEMESTER:

Course Code	Course Name	Scheme of Studies Periods per week			Credits
		L	T	P	
ME 351	Engineering Management	3	-	-	3
MDS 311	Statistical Data Analysis	3	1	-	4
MDS 312	Numerical Analysis	3	-	-	3
MDS 313	Database Management System	3	-	-	3
MDS 314	Neural Networks	3	-	-	3
	Programme Elective-1(A)	3	-	-	3
MDS 315	DBMS Lab	-	-	4	2
MDS 316	Programming Lab in R	-	-	2	1
MDS 317	Internship/Industrial Training	-	-	2	1
Total Hours = 27		**18**	**1**	**8**	**23**
Total Credits (Cumulative)					**114**
Additional Subject: -National Cadet Corps (NCC)					
NCC 351	National Cadet Corps V	**1**	**5**	**1**	**7**
Total Credits (Cumulative)					**21**

SIXTH SEMESTER:

Course Code	Course Name	Scheme of Studies Periods per week			Credits
		L	T	P	
MDS 321	Optimization Technique	3	1	-	4
MDS 322	Graph Theory and Algorithms	3	1	-	4
MDS 323	Data Mining & Predictive Data Analysis	3	-	-	3
MDS 324	Machine Learning	3	-	-	3
	Programme Elective-2(A)	3	-	-	3
MDS 325	Programming Lab in Tableau	-	-	2	1
MDS 326	Programming Lab in MATLAB	-	-	2	1
MDS 327	Data Mining Lab	-	-	2	1
MDS 328	Minor Project			4	2
Total Hours=27		**15**	**2**	**10**	**22**
Total Credits (Cumulative)					**136**
Additional Subject: -National Cadet Corps (NCC)					
NCC 352	National Cadet Corps VI	**2**	**-**	**1**	**3**
Total Credits (Cumulative)					**24**

SEVENTH SEMESTER:

Course Code	Course Name	Scheme of Studies Periods per week			Credits
		L	T	P	
HUM 451	Engineering Economics and IPR	3	-	-	3
MDS 411	Real Analysis	3	-	-	3
MDS 412	Data Science & Big data	3	-	-	3
MDS 413	Cryptography	3	-	-	3
	Programme Elective-3(A)	3	-	-	3
	Open Elective-1(C)	3	-	-	3
MDS 414	Programming Lab in Big data	-	-	2	1
MDS 415	Project Based Lab-2	-	-	4	2
MDS 416	Industrial / Field Training	-	-	2	1
Total Hours = 26		**18**	**-**	**8**	**22**
Total Credits (Cumulative)					**158**

EIGHTH SEMESTER:

Course Code	Course Name	Scheme of Studies Periods per week			Credits
		L	T	P	
MDS 421 MDS 422	Major Project Internship	-	-	16	8
MDS 423	General Proficiency				1
MDS 424	Deep Learning	3	-	-	3
	Programme Elective-4(A)	3	-	-	3
	Programme Elective-5(A)	3	-	-	3
Total Hours = 25		**9**	**-**	**16**	**18**
Total Credits (Cumulative)					**176**

NINTH SEMESTER

Course Code	Course Name	Scheme of Studies Periods per week			Credits
		L	T	P	
MDS 511	Functional Analysis	3	-	-	3
MDS 512	Topology	3	-	-	3
	Programme Elective-6(A) & 7(A)	3	-	-	3
	Programme Elective-6(A) & 7(A)	3	-	-	3
MDS 513	Industrial Training/ Field Training				2
MDS 514	Dissertation Phase-I	-	-	20	10
Total Hours = 32		**12**	**0**	**20**	**24**
Total Credits (Cumulative)					**200**

TENTH SEMESTER

Course Code	Course Name	Scheme of Studies Periods per week			Credits
		L	T	P	
MDS 521	Dissertation Phase-II	-	-	40	20
Total Hours = 40		-	**-**	**40**	**20**
Total Credits (Cumulative)					**220**

LIST OF PROGRAMME ELECTIVES (GROUP A)

Elective 1(A)

MDS 351	Application Development Using JAVA
MDS 352	Differential Equations & Applications
MDS 353	Mathematical Logic & Logic Programming
MDS 354	Iterative Methods for Nonlinear Equations
MDS 355	Evolutionary Algorithms
MDS 356	Business Process Management
MDS 357	Modeling and Simulation
MDS 358	Parallel Computing
MDS 359	Application Development Using Python

Elective 2(A)

MDS 361	Queueing Models for Computer and Communication Systems
MDS 362	Fluid Dynamics
MDS 363	Solid Mechanics
MDS 364	Number Theory
MDS 365	Cloud Computing
MDS 366	Web Application Development
MDS 367	Petrinet Modeling
MDS 368	Computer Graphics

Elective 3(A)

MDS 451	Advanced Optimization Technique
MDS 452	Numerical Linear Algebra
MDS 453	Numerical Optimization
MDS 454	Multivariate Statistical Analysis
MDS 455	Algebraic Topology
MDS 456	Image Processing
MDS 457	Data Visualization
MDS 458	Statistical Natural Language Processing
MDS 459	Process Aware Information System
MDS 460	Decision Science
MDS 461	Next Generation Networks
MDS 462	Special topic in Mathematics and Data Science-I

Elective 4(A)

MDS 471	Advanced Numerical Methods
MDS 472	Measure Theory
MDS 473	Econometrics
MDS 474	Stochastic Process and Simulation
MDS 475	Finite Element Methods
MDS 476	Enterprise Resource Planning
MDS 477	Multimedia & Virtual Reality

MDS 478	Computer Vision
MDS 479	Customer Relation Management

Elective 5(A)

MDS 481	Mathematical Biology
MDS 482	Coding Theory
MDS 483	Tensors and Differential Geometry
MDS 484	Internet of Things
MDS 485	Knowledge Management
MDS 486	Special topic in Mathematics and Data Science-II

Elective 6(A) & 7(A)

MDS 551	Big Data Analytics
MDS 552	Financial Mathematics
MDS 553	Wavelets: Theory and Applications
MDS 554	Information Retrieval
MDS 555	Modeling Techniques in Predictive Data Analysis
MDS 556	Business Intelligence
MDS 557	Special topic in Mathematics and Data Science-III