माधव प्रौद्योगिकी एवं विज्ञान संस्थान, ग्वालियर
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
Deemed University
(Declared under Distinct Category by Ministry of Education, Government of India)
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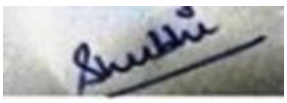
Department of Electronics and Telecommunication Engineering

Multiple Mode Teaching Learning Pattern

Name of Course with Code: Data Science (3200511)			Class: B. Tech. III Year (VSem)		Session: July-Dec 2025
S. No.	**Unit**	**Content to be Covered**	**Teaching Session**	**CO Level**	**Mode**
1.	**Unit I**	Need for data science, benefits and uses, facets of data,	1	1	Offline Teaching
2.		Data science process	2	1	Open Discussions
3.		Introduction of basics python tool, Setting working Directory.	3	1	Offline Teaching
4.		Creating and saving a script file, File execution	4	1	Offline Teaching
5.		Removing variables from environment, clearing environment, Commenting script files, Variable creation	5	1	Offline Teaching
6.		Data types and associated operations, Arithmetic and logical operators	6	1	Offline Teaching
7.	**Unit II**	Control structures, Loop, Functions	7	2	Offline Teaching
8.		Data structures: Lists, Arrays, Tuples, Dictionary, Sets,	8	2	Offline Teaching
9.		NumPy library	9	2	Offline Teaching
10.		Data Collection: Getting to know your data	10	2	Offline Teaching
11.		Types of Data, Data collection strategies	11	2	Offline Teaching
12.		Data Pre processing, Feature engineering	12	2	Learning through demonstration
13.		Feature engineering	13	2	Offline Teaching
14.		Exploratory data analysis	14	2	Offline Teaching
15.	**Unit III**	Descriptive Statistics	14	3	Offline Teaching
16.		Mean, Standard Deviation, Skewness and Kurtosis,	16	3	Learning through demonstration
17.		Inferential statistics: hypothesis testing	17	3	Offline Teaching
18.		Probability: probability theory	18	3	Offline Teaching
19.		Conditional probability.	19	3	Offline Teaching
20.		Pandas library, data frame and data frame related operations	20	3	Offline Teaching
21.	**Unit**	Data Cleaning and Preparation	21	4	Offline Teaching

22.	**IV**	Handling Missing Data	22	4	Offline Teaching
23.		Data Transformations using pandas and sklearn library	23	4	Offline Teaching
24.		Removing Duplicates ,Replacing Values	24	4	Offline Teaching
25.		Detecting Outliers, Scatter plot, Line plot, Bar plot, Histogram, Box plot, Pair plot	25	4	Offline Teaching
26.	**Unit V**	Supervised learning: Regression	26	5	Online learning
27.		Classification	27	5	Online learning
28.		Linear regression, Logistic regression	28	5	Online learning
29.		Decision tree, tree creation with entropy and information gain	29	5	Online learning
30.		ID3 algorithm, Unsupervised learning: Clustering, Reinforcement learning	30	5	Online learning
31.		Random forest, naïve bayes theorem	31	5	Online learning
32.	**Add on Topics**	Machine learning algorithm implementation	32	5	Learning through experiment
		Neural networks	33	5	Offline Teaching

Online	Offline						
20%	Offline Teaching	Group based Learning	Learning through projects	Learning through demonstration	Learning through experiment	Activity /Problem based Learning	Onsite/ field-based learning/Open Discussion
	50%	-	-	12.5%	5%	-	12.5%



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