



Kot Bhalwal, Jammu

Model Institute of Engineering
& Technology (Autonomous)
Course File

COURSE HANDOUT

APPLIED DATA SCIENCE (COM-702 (C))

CSE- 7th SEMESTER

ACADEMIC YEAR (2024-25)

Dr. Palvi Sharma

Assistant Professor

Department of Computer Science & Engineering



Department of Computer Science & Engineering

Model Institute of Engineering & Technology (Autonomous)

Kot Bhalwal, Jammu - 181122

www.mietjmu.in



Dr. Arun K. Gupta Teaching-Learning Centre

Version 1.1

Please Do Not Print Unless Necessary





Kot Bhalwal, Jammu

Course Code	Course Name	Course Type	Cd	L	T	P	Marks		
							Sessional	Final Exam	Total
COM-702 (C)	Applied Data Science	PEC	3	3	0	0	50	100	150

COURSE OUTCOMES

At the end of the course the student will be able to	
CO1	Describe the importance of data science and the various operations involved.
CO2	Articulate the different steps involved in the data acquisition ecosystem and their relevance
CO3	Assess diverse machine learning techniques for data analysis for different applications.
CO4	Develop data visualization and analytics skills using different libraries and tools.
CO5	Apply various AI models and techniques for Text and Natural Language Processing.

Unit 1: Introduction to Data Science, Overview of data science and its applications, Introduction to data analysis using Python and Jupyter notebooks, Data preprocessing and cleaning techniques, Exploratory data analysis and visualization.

(9 Hrs.)

Unit 2: Data Wrangling and Preparation: Data acquisition and integration from various sources, Handling missing data and outliers, Feature Engineering and transformation, Data quality assessment and validation.

(10 Hrs.)

Unit 3: Machine Learning Techniques: Introduction to supervised and unsupervised learning, Regression and classification algorithms, Clustering and dimensionality reduction, Model evaluation and selection.

(11 Hrs.)

Unit 4: Data Visualization and Communication: Data visualization principles and best practices, Visualizing data using Python libraries (e.g. Matplotlib, Seaborn), Storytelling with data, Communication data insights effectively.

(10 Hrs.)

Unit 5: From text to Deep Learning: Text mining and natural language processing, Time series analysis and forecasting, Recommendation systems, Deep Learning and neural networks.

(11 Hrs.)

Text Books

S.No	Name of the Books	Name of the Author	Publisher Name	Edition (Pub.Yr.)
1	Python for Data Analysis	Wes McKinney	O'Reilly Media	2 nd (2017)

2	Data Analysis using Python	Bharti Motwania	Wiley	1 st (2020)
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Reference Books

S.No	Name of the Books	Name of the Author	Publisher Name	Edition (Pub.Yr.)
1	Data Science and Machine Learning using Python	Dr, Reema Thareja	McGraw Hills	2017

COURSE PLAN		
Unit-I Introduction to Data Science		
S.No	Topics	Recommended Books
1	Overview of data science and its applications	Book 1,Ch 1
2	Introduction to data analysis using Python and Jupyter notebook	Book 1,Ch 1
3	Data preprocessing and cleaning techniques	Book 1,Ch 1
4	Exploratory data analysis and visualization	Book 1,Ch 1
Unit-II Data Wrangling and Preparation		
5	Data acquisition and integration from various sources	Book 1,Ch 2
6	Handling missing data and outliers	Book 1,Ch 2
7	Feature Engineering and transformation	Book 1,Ch 2
8	Data quality assessment and validation	Book 1,Ch 2
Unit-III Machine Learning Techniques		
10	Introduction to supervised and unsupervised learning	Book 2,Ch 1
11	Regression and classification algorithms	Book 1,Ch 3
12	Clustering and dimensionality reduction	Book 1,Ch 3
13	Model evaluation and selection	Book 2,Ch 1
Unit-IV Data Visualization and Communication		
14	Data visualization principles and best practices	Book 1,Ch 4
15	Visualizing data using Python libraries (e.g. Matplotlib, Seaborn)	Book 3,Ch 5
16	Storytelling with data	Book 1,Ch 4
17	Communication data insights effectively	Book 1,Ch 5
Unit-V From text to Deep Learning		
18	Text mining and natural language processing	Book 3,Ch 5
19	Time series analysis and forecasting	Book 3,Ch 5
20	Recommendation systems	Book 2,Ch 4
21	Deep Learning and neural networks	Book 1,Ch 7

ADDITIONAL WEB RESOURCES

1.	Coursera: Foundations: Data, Data, Everywhere Link: https://www.coursera.org/programs/test-program-93zov/learn/foundations-data?source=browse
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2. Coursera: Python for Applied Data Science AI.

Link : <https://www.coursera.org/learn/python-for-applied-data-science-ai/home/welcome>

GRADING AND ASSESSMENT

- **MST 1:** 10 marks
- **MST 2:** 10 marks
- **Assignment:** 20 marks
- **Attendance:** 10 marks
- **Final Examination:** 100 marks

COURSE POLICIES

- **Attendance:** Minimum 75% attendance is mandatory to appear in the final examination of the course.
- **Academic Integrity:** MIET's academic integrity policies apply. Plagiarism will not be tolerated.
- **Late Submissions:** Assignments and projects must be submitted by the specified timelines.

FACULTY INFORMATION

- **Office Hours**
Monday (12:05 PM - 12:55 PM)
Friday (12:05 PM - 12:55 PM)
- **Contact Information**
palvi.cse@mietjammu.in