

MOHAMED SATHAK ENGINEERING COLLEGE
Kilakarai- 623806

STAFF NAME : Mrs.K.Samundees

LESSON PLAN

Department of Information Technology

Name of the Subject	Foundations of Data Science	Regulation	2021
Subject Code	CS3352	Year / Sem	II / III
Acad Year	2023-2024	Batch	2022-2026

Course Objective

To understand the data science fundamentals and process.

To learn to describe the data for the data science process.

To learn to describe the relationship between data.

To utilize the Python libraries for Data Wrangling.

To present and interpret data using visualization libraries in Python

Course Outcome

CO1: Define the data science process

CO2: Understand different types of data description for data science process

CO3: Gain knowledge on relationships between data

CO4: Use the Python Libraries for Data Wrangling

CO5: Apply visualization Libraries in Python to interpret and explore data

CO6: Apply Real time Application using Data science Libraries.

Lesson Plan

Sl. No.	Topic(s)	T / R*	Periods Required	Mode of Teaching (BB / PPT / NPTEL / MOOC / etc)	Blooms Level (L1-L6)	CO
		Book				

UNIT I: INTRODUCTION (9)

1	Data Science: Benefits and uses	T1	1	BB	L1	CO1
2	facets of data	T1	1	BB	L1	CO1
3	Data Science Process: Overview	T1	1	BB	L1	CO1
4	Defining research goals	T1	1	BB	L1	CO1
5	Retrieving data – Data preparation	T1	1	BB	L1	CO1
6	Exploratory Data analysis	T1	1	BB	L1	CO1
7	build the model–presenting findings and building appli	T1	1	BB	L1	CO1
8	Data Mining	T1	1	BB	L1	CO1

9	Data Warehousing	T1	1	BB	L1	CO1
10	Basic Statistical descriptions of Data	T1	1	BB	L5	CO1

Suggested Activity: Assignment / Case Studies / Tuorials/ Quiz / Mini Projects / Model Developed/others Planned if any. Assignment

Evaluation method: Assignment

UNIT II: DESCRIBING DATA (9)

13	Types of Data	T2	1	BB	L2	CO2
14	Types of Variables	T2	1	BB	L2	CO2
15	Describing Data with Tables	T2	1	BB	L2	CO2
16		T2	1	BB	L3	CO2
17	Graphs	T2	1	BB	L3	CO2
18		T2	1	BB	L3	CO2
19	Describing Data with Averages	T2	1	BB	L3	CO2
20		T2	1	BB	L3	CO2
21	Describing Variability	T2	1	BB	L2	CO2
22	Normal Distributions and Standard (z) Scores	T2	1	BB	L4	CO2

Suggested Activity: Assignment / Case Studies / Tuorials/ Quiz / Mini Projects / Model Developed/others Planned if any. Assignment

Evaluation method: Assignment and Tutorial

UNIT III: DESCRIBING RELATIONSHIPS(9)

25	Correlation –Scatter plots	T2	1	BB	L3,L6	CO3
26	correlation coefficient for quantitative data	T2	1	BB	L4	CO3
27	computational formula for correlation coefficient)	T2	1	BB	L3	CO3
28	Regression—regression line	T2	1	BB	L4	CO3

29	Least squares regression line	T2	1	BB	L5	CO3
30	Standard error of estimate	T2	2	BB	L4,L6	CO3
31		T2				CO3
32	interpretation of r ²	T2	1	BB	L4,L6	CO3
33	Multiple regression equations	T2	1	BB	L4,L5	CO3
34	Regression towards the mean	T2	1	BB	L4,L6	CO3

Suggested Activity: Assignment / Case Studies / Tuorials/ Quiz / Mini Projects / Model Developed/others Planned if any Assignment

Evaluation method: Assignment and Tutorial

UNIT IV: PYTHON LIBRARIES FOR DATA WRANGLING (9)

37	Basics of Numpy arrays	T3	1	BB/NPTEL	L4	CO4
38	Aggregations	T3	1	BB/NPTEL	L4	CO4
39	Computations on arrays	T3	1	BB/NPTEL	L4	CO4
40	–comparisons, masks, boolean logic	T3	1	BB/NPTEL	L3	CO4
41	fancy indexing – structured arrays	T3	1	BB/NPTEL	L4	CO4
42	Data manipulation with Pandas	T3	1	BB/NPTEL	L4	CO4
43	data indexing and selection – operating on data	T3	1	BB/NPTEL	L4	CO4
44	missing data – Hierarchical indexing	T3	1	BB/NPTEL	L4	CO4
45	combining datasets	T3	1	BB/NPTEL	L4	CO4
46	data – Hierarchical indexing – combining datasets	T3	1	BB/NPTEL	L4	CO4

Suggested Activity: Assignment / Case Studies / Tuorials/ Quiz / Mini Projects / Model Developed/others Planned if any NPTEL Quiz

Evaluation method: Quiz

UNIT V: DATA VISUALIZATION

49	Importing Matplotlib – Line plots	T3	1	BB/NPTEL	L3,L4 & L6	CO5
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50	Scatter plots – visualizing errors	T3	1	BB/NPTEL	L3,L4 &L6	CO5
51	density and contour plots	T3	1	BB/NPTEL	L4 &L6	CO5
52	Histograms – legends	T3	1	BB/PPT/NPTEL	L3,L4 &L6	CO5
53	colors – subplots	T3	1	BB/PPT/NPTEL	L3,L4 &L6	CO5
54	text and annotation – customization	T3	1	BB/PPT/NPTEL	L3,L4 &L6	CO5
55	three dimensional plotting	T3	1	BB/PPT/NPTEL	L3,L4 &L6	CO5
56		T3	1	BB/PPT/NPTEL	L4 &L6	CO5
57	Geographic Data with Basemap	T3	1	BB/PPT/NPTEL	L4 &L6	CO5
58	Visualization with Seaborn.	T3	1	BB/PPT/NPTEL	L3,L4 &L6	CO5

Suggested Activity: Assignment / Case Studies / Tuorials/ Quiz / Mini Projects / Model Developed/others Planned if any

Evaluation method: Seminar & QuiZ

Content Beyond the Syllabus Planned

1	DBMS
2	Prediction

Text Books

1	David Cielen, Arno D. B. Meysman, and Mohamed Ali, “Introducing Data Science”, Manning Publications, 2016. (Unit I)
2	Robert S. Witte and John S. Witte, “Statistics”, Eleventh Edition, Wiley Publications, 2017. (Units II and III)
3	Jake VanderPlas, “Python Data Science Handbook”, O’Reilly, 2016. (Units IV and V)

Reference Books

1	Allen B. Downey, “Think Stats: Exploratory Data Analysis in Python”, Green Tea Press,2014.
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Website / URL References

1	https://youtu.be/-ETQ97mXXFO
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Blooms Level

Level 1 (L1) : Remembering	Lower Order Thinking	Fixed Hour Exams	Level 4 (L4) : Analysing		Higher Order Thinking
Level 2 (L2) : Understanding			Level 5 (L5) : Evaluating		
Level 3 (L3) : Applying			Level 6 (L6) : Creating		

Mapping syllabus with Bloom’s Taxonomy LOT and HOT

Unit No	Unit Name	L1	L2	L3	L4	L5	L6	LOT	HOT
Unit 1	INTRODUCTION	9	0	0	0	1	0	9	1
Unit 2	DESCRIBING DATA	0	4	5	1	0	0	4	6
Unit 3	DESCRIBING RELATIONSHIPS	0	0	2	6	2	4	0	14
Unit 4	PYTHON LIBRARIES FOR DATA WRANGLING	0	0	1	9	0	0	0	10
Unit 5	DATA VISUALIZATION	0	0	7	10	0	10	0	27

Total				9	4	15	26	3	14	13	58		
Total Percentage				12.676	5.63	21.13	36.62	4.23	20	18.31	81.69		
CO PO Mapping													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1
CO1	2	2	1	2	2	-	-	-	1	1	1	2	2
CO2	2	1	-	1	1	-	-	-	2	1	1	2	2
CO3	2	2	1	2	2	1	1	-	1	2	1	3	2
CO4	3	2	2	1	3	1	1	-	1	1	2	2	3
CO5	2	2	1	2	3	1	1	-	1	1	1	2	2
CO6	3	3	2	2	2	2	2	1	2	2	1	3	3
Avg	2.33333	2	1.4	1.66667	2.166667	1.25	1.25	1	1.3333	1.3333333	1.1667	2.333	2.333
3		High level			2		Moderate level			1		Low	
Name & Sign of Faculty Incharge : K.Samundeeswari													
Name & Sign of Subject Expert :Dr.B.Aysha Banu													
Head of the Department :Dr.B.Aysha Banu													

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Innovative Practice

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Reflection

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PSO2
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level