



# SWARNANDHRA

## COLLEGE OF ENGINEERING & TECHNOLOGY (AUTONOMOUS)

Accredited by National Board of Accreditation, AICTE, New Delhi, Accredited by NAAC with "A" Grade – 3.32 CGPA, Recognized under 2(f) & 12(B) of UGC Act 1956, Approved by AICTE, New Delhi, Permanent Affiliation to JNTUK, Kakinada Seetharampuram, W.G.DT., Narsapur-534280, (Andhra Pradesh)

### DEPARTMENT OF AIDS

Course Code	Course Title	Semester/Regulation	Branch	Contact Periods /Week	Academic Year	Date of commencement of Semester
20CD3T01	Data Science	III(R20)	CSE-DS	6	2023-2024	07/08/2023
<b>COURSE OUTCOMES</b>						
1	Acquire the knowledge and expertise to become a proficient data scientist					
2	Demonstrate an understanding of statistics and machine learning concepts that are vital for data science					
3	Explain how data is collected, managed and stored for data science					
4	Interpret the key concepts in data science, including their real-world applications and the toolkit used by data scientists					
5	Illustrate data collection and management scripts using MongoDB					
UNIT	Out Comes / Bloom's Level	Topics No.	Topics/ Activity	Text Book/ Reference	Contact Hour	Delivery Method
I	CO - 1	1.1	overview	T1,T2	1	Chalk & Board  Power point presentations  Assignment  Test
		1.2	overview	T1,T2	1	
		1.3	Introduction to Core Concepts and Technologies-	T1,T2	1	
		1.4	Introduction	T1,T2	1	
		1.5	Terminology	T1,R1	1	
		1.6	data science process,	T1,R1	1	
		1.7	data science toolkit,	T1,R1	1	
		1.8	Types of data,	T1,R1	1	
		1.9	Example applications	T1,R1	1	
		1.10	Example applications	T1,R1	1	
			Assignment 1			
Content beyond syllabus			Data Science in Business: Explore how data science is being used in various industries for decision-making, optimization, and gaining a competitive edge.	R2	1	
<b>Total</b>					11	
II	CO - 2	2.1	Data Collection and	T1,R2	1	Chalk



# SWARNANDHRA COLLEGE OF ENGINEERING & TECHNOLOGY (AUTONOMOUS)

Accredited by National Board of Accreditation, AICTE, New Delhi, Accredited by NAAC with "A" Grade – 3.32 CGPA, Recognized under 2(f) & 12(B) of UGC Act 1956. Approved by AICTE, New Delhi, Permanent Affiliation to JNTUK, Kakinada Seetharampuram, W.G.DT., Narsapur -534280, (Andhra Pradesh)

		<b>Management-</b>			<b>&amp; Board</b>  <b>Power point presentations</b>  <b>Assignment</b>  <b>Test</b>	
		2.2	Introduction,	T1,R2		1
		2.3	Sources of data,	T1,R2		1
		2.4	Data collection	T1,R2		1
		2.5	APIs	T1,R2		1
		2.6	Exploring and fixing data	T1,R2		1
		2.7	Data storage and management	T1,R2		1
		2.8	Data storage and management	T1,R2		1
		2.9	using multiple data sources	T1,R2		1
		Assignment 2				
<b>Content beyond syllabus</b>		Data Cleaning and Preprocessing: Explore advanced methods for cleaning and preparing data for analysis, including handling missing values, outliers, and noise.	R1	1		
		Data Integration: Learn about techniques for integrating data from multiple sources with varying formats and structures.	R1	1		
				<b>Total</b>	<b>11</b>	
<b>III</b>	<b>CO - 3</b>	3.1	<b>Data Analysis-</b>	T1,R2	1	<b>Chalk &amp; Board</b>  <b>Power point presentations</b>  <b>Assignment</b>
		3.2	Introduction,	T1,R2	1	
		3.3	Terminology and concepts,	T1,R2	1	
		3.4	Introduction to statistics,	T1,R2	1	
		3.5	Central tendencies and distributions,	T1,R2	1	
		3.6	Variance,	T1,R2	1	
		3.7	Distribution properties and arithmetic,	T1,R2	1	
		3.8	Basic machine learning algorithms,	T1,R2	1	
		3.9	Linear regression,	T1,T2	1	
		3.10	SVM,	T1,T2	1	



# SWARNANDHRA

## COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

Accredited by National Board of Accreditation, AICTE, New Delhi, Accredited by NAAC with "A" Grade – 3.32 CGPA, Recognized under 2(f) & 12(B) of UGC Act 1956, Approved by AICTE, New Delhi, Permanent Affiliation to JNTUK, Kakinada Seetharampuram, W.G.DT., Narsapur-534280, (Andhra Pradesh)

		3.11	Naive Bayes	T1,R2	1	Test
			Assignment 3			
	Content beyond syllabus		Time Series Analysis: Delve into the analysis of time-dependent data, including forecasting and anomaly detection using methods like ARIMA and LSTM.	R2	1	
<b>Total</b>					<b>12</b>	
IV	CO – 4	4.1	<b>Data Visualization-</b>	T1,R2	1	Chalk & Board  Power point presentations  Assignment  Test
		4.2	Introduction,	T1,R2	1	
		4.3	Types of data visualization,	T1,R2	1	
		4.4	<b>Data for visualization-</b>	T1,R2	1	
		4.5	Data types,	T1,R2	1	
		4.6	Data encodings,	T1,R2	1	
		4.7	Retinal variables,	T1,R2	1	
		4.8	Mapping variables to encodings,	T1,R2	1	
		4.9	Visual encodings	T1,R2	1	Assignment
			Assignment 4			
	Content beyond syllabus	4.12	Geospatial Visualization: Explore techniques for visualizing geographical data, including choropleth maps, heatmaps, and spatial clustering.	R3	1	Test
<b>Total</b>					<b>10</b>	
IV	CO-5	5.1	<b>Applications of Data Science-</b>	T1,T3	1	Chalk & Board  Power point presentations
		5.2	Technologies for visualization,	T1,T3	1	
		5.3	Bokeh (Python),	T1,T3	1	
		5.4	recent trends in various data collection and analysis techniques,	T1,T3	1	
		5.5	recent trends in various data collection	T1,T3	1	



# SWARNANDHRA

## COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

Accredited by National Board of Accreditation, AICTE, New Delhi, Accredited by NAAC with "A" Grade – 3.32 CGPA, Recognized under 2(f) & 12(B) of UGC Act 1956. Approved by AICTE, New Delhi, Permanent Affiliation to JNTUK, Kakinada Seetharampuram, W.G.D.T., Narsapur-534280, (Andhra Pradesh)

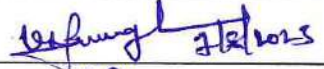


		and analysis techniques,			Assignment  Test
	5.6	various visualization techniques,	T1,T3	1	
	5.7	application development methods of used in data science.	T1,T3	1	
	5.8	Application development methods of used in data science.	T1,T3	1	
		Assignment 5			
	Content beyond syllabus	AI Ethics and Bias: Deepen your understanding of the ethical considerations in data science and AI, focusing on fairness, accountability, and mitigating bias in algorithms.		1	
				09	
<b>CUMULATIVE PROPOSED PERIODS</b>				72	
<b>Text Books:</b>					
S.No	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION				
1	"The Art of Data Science", 1 <sup>st</sup> edition, Roger D. Peng and Elizabeth matsui, Lean Publications, 2015				
2	"Algorithms for Data Science", 1 <sup>st</sup> edition, Steele, Brian, Chandler, John, Reddy, Swarna, springers Publications, 2016				
<b>Reference Books:</b>					
S.No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION				
1	Doing Data Science: Straight Talk From The Frontline, 1 <sup>st</sup> edition, Cathy O'Neil and Rachel Schutt, O'Reilly, 2013				
	Mining of Massive Datasets, 2 <sup>nd</sup> edition, Jure Leskovek, Anand Rajaraman and Jeffrey Ullman, v2.1, Cambridge University Press, 2014				
<b>Web Details:</b>					
1	<a href="https://www.javatpoint.com/data-science">https://www.javatpoint.com/data-science</a>				



# SWARNANDHRA COLLEGE OF ENGINEERING & TECHNOLOGY (AUTONOMOUS)

Accredited by National Board of Accreditation, AICTE, New Delhi, Accredited by NAAC with "A" Grade – 3.32 CGPA, Recognized under 2(f) & 12(B) of UGC Act 1956, Approved by AICTE, New Delhi, Permanent Affiliation to JNTUK, Kakinada Seetharampuram, W.G.DT., Narsapur-534280, (Andhra Pradesh)

2	<a href="https://www.geeksforgeeks.org/data-analytics-and-its-type/">https://www.geeksforgeeks.org/data-analytics-and-its-type/</a>
---	---

	Name	Signature with Date
i. Faculty	V Durga Rao	
ii. Module Coordinator	Dr G Sudhakar	
iii. Program Coordinator	Dr.B.Rama krishna	

  
Principal