Shri Vile Parle Kelavani Mandal's

Dwarkadas J. Sanghvi College of Engineering

(Autonomous College Affiliated to the University of Mumbai)

Scheme and detailed syllabus
of
DJS23
Honors Program in Data Analytics

With effect from the Academic Year: 2024-2025

Proposed scheme for Honors in Data Analytics (Academic Year 2024-2025)

Sr.	Course Code	Course	Teaching Scheme (hrs.)				Continuous Assessment (A) (marks)			Semester End Assessment (B) (marks)					(A+B)	Total Credits
			Th	P	T	Credits	Th	T/W	Total CA (A)	Th	O	P	O & P	Total SEA (B)		
		Sem III														
1	DJS23BCH1301	**Fundamentals of Data Mining**	3	--	--	3	40	--	40	60	--	--	--	60	100	**3**
		Sem IV														
2	DJS23BCH1401	**Data Analytics and Visualization**	3		--	3	40	--	40	60	--	--	--	60	100	**3**
	DJS23BLH1401	**Data Analytics and Visualization Laboratory**		2		2		25	25	60	25			25	50	**1**
		Sem V														
3	DJS23BCH1501	**Natural Language Processing and Text Analytics**	3	--	--	3	40	--	40	60	--	--	--	60	100	**3**
		Sem VI														
5	DJS23 BCH1601	**Time Series and Forecasting Analytics**	4	--	--	4	40	--	40	60	--	--	--	60	100	**4**
6	DJS23 BLH1601	**Time Series and Forecasting Analytics Laboratory**	--	2	--	1	--	25	25	--	25	--	--	25	50	**1**
		Sem VIII														
7	DJS23 BCH1801	**Optimization for Decision Analytics**	3	--	--	3	40	--	40	60	--	--	--	60	100	**3**
		Total	16	4	—	18	200	50	250	300	50	—	—	350	600	18
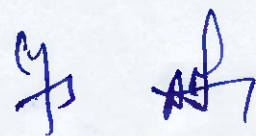
Continuous Assessment (A):

Course	Assessment Tools	Marks	Time (hrs.)
Theory	One Term test (based on 40 % syllabus)	15 each	1
	Second Term test (next 40 % syllabus) / presentation / assignment / course project / group discussion / any other.		
Audit course	Performance in the assignments / quiz / power point presentation / poster presentation / group project / any other tool.	10	As applicable
Laboratory	Performance in the laboratory and documentation.	--	
Tutorial	Performance in each tutorial & / assignment.	--	
Laboratory &Tutorial	Performance in the laboratory and tutorial.	--	

The final certification and acceptance of term work will be subject to satisfactory performance upon fulfilling minimum passing criteria in the term work / completion of audit course.

Continuous Assessment (B):

Course	Assessment Tools	Marks	Time (hrs.)
Theory / * Computer based	Written paper based on the entire syllabus.	60	2
	* Computer based assessment in the college premises.		
Oral	Questions based on the entire syllabus.	--	As applicable
Practical	Performance of the practical assigned during the examination and the output / results obtained.	--	2
Oral & Practical	Project based courses - Performance of the practical assigned during the examination and the output / results obtained. Based on the practical performed during the examination and on the entire syllabus.	--	2

Program: B.Tech in Computer Science and Engineering(IoT and Cybersecurity with Bolckchain Technology)					S.Y.BTech			Semester : IV	
Course : Data Analytics and Visualization					Course Code: DJS23BCH1401				
Course: Data Analytics and Visualization Laboratory					Course Code: DJS23BLH1401				

Teaching Scheme (Hours / week)				Evaluation Scheme					
				Semester End Examination Marks (A)	Continuous Assessment Marks (B)				Total marks (A+ B)
Lectures	Practical	Tutorial	Total Credits	Theory	Term Test 1	Term Test 2	Assignment	Total	
				60	15	15	10	40	100
				Laboratory Examination			Term work		Total Term work
3	2	–	4	Oral	Practical	Oral & Practical	Laboratory Work	Tutorial / Mini project / presentation/ Journal	50
				25	–	–	10	15	25

Prerequisite: Database management System

Course Objectives: The Objective of course is

1. Provide a comprehensive understanding of NumPy and Pandas
2. Learn Loading, storing and managing data using various file formats, and to understand the processes of reading from and writing to these formats in data analysis tasks.
3. Equip students with essential techniques for cleaning, transforming, and preparing data.
4. Create and customize various data visualizations using matplotlib, pandas, and seaborn.
5. Perform advanced data aggregation and grouping operations using Python, enabling them to effectively analyze, manipulate, and summarize large datasets by applying various grouping techniques and aggregation functions.

Course outcomes: On successful completion of this course, learner will be able to:

1. Create and manipulate ndarrays, perform arithmetic operations, implement indexing and slicing techniques
2. Utilize pandas to create, manipulate, and analyze data structures , and compute descriptive statistics to gain insights from data.
3. Demonstrate the ability to load, store, and manage data in various formats
4. Apply data cleaning and preparation techniques, including handling missing data, performing data transformations, and utilizing advanced data types, to effectively wrangle and reshape complex datasets.
5. Create and customize different types of plots such as line, bar, scatter, and density plots
6. Apply group operations, group data using dictionaries, series, functions, and index levels.

2. https://clauswilke.com/dataviz/
3. https://help.tableau.com/current/offline/en-us/tableau_blueprint.pdf
4. https://cedar.princeton.edu/sites/g/files/toruqf1076/files/media/introduction_to_tableau_training_0.pdf

Online Courses: NPTEL

1. Python for Data Science, By Prof. Ragunathan Rengasamy, IIT Madras

   https://onlinecourses.nptel.ac.in/noc22_cs32/preview

2. Programming in Python, By Dr. Rizwan Rehman , Dibrugarh University
   https://onlinecourses.swayam2.ac.in/cec22_cs20/preview

3. Python for Data Science, Prof. Ragunathan Rengasamy, IIT Madras
   https://archive.nptel.ac.in/courses/106/106/106106212/

Evaluation Scheme:

Semester End Examination (A):
Theory:

1. Question paper based on the entire syllabus total comprising of 60 marks.
2. Total duration allotted for writing the paper is 2 hrs.

Laboratory:

Oral examination will be based on the entire syllabus including the practical performed during laboratory sessions.

Continuous Assessment (B):
Theory:

1. Term Test 1 (based on 40 % syllabus) of 15 marks for the duration of 45 min.
2. Term Test 2 (on next 40 % syllabus) of 15 marks for the duration of 45 min.
3. Assignment / course project / group discussion /presentation / quiz/ any other for 10 marks.

Laboratory: (Term work)

1. Term Work shall consist of at least 8 practical's based on the above list.

2. The distribution of marks for term work shall be as follows:
   i.Laboratory work (Performance of Experiments, Write-up): 15Marks
   ii.Mini Project/Case study/Presentation : 10 Marks

The final certification and acceptance of term work will be subject to satisfactory performance of laboratory work and upon fulfilling minimum passing criteria in the term work.

| **Prepared by** | **Checked by** | **Head of the Department** | **Vice Principal** | **Principal** |