



Shri Vile Parle Kelavani Mandal's

**Dwarkadas J. Sanghvi College of Engineering**

*(Autonomous College Affiliated to the University of Mumbai)*

Scheme and Detailed Syllabus (DJS23)

**Second Year B.Tech**

in

**Artificial Intelligence (AI) and Data Science  
Honors Degree Program**

in

**Business Intelligence  
(Semester IV)**

Prepared by: - Board of Studies in Artificial Intelligence (AI) and Data Science

Recommended by: - Academic Council of Dwarkadas. J. Sanghvi College of Engineering

Approved by: - Governing Body of Dwarkadas. J. Sanghvi College of Engineering

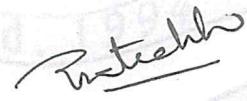


Scheme for Undergraduate Program in Artificial Intelligence (AI) and Data Science with honors in Business Intelligence:  
**DJS23(Autonomous) (Academic Year 2025-2026)**

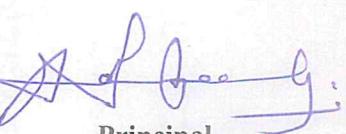
Sr. no.	Course Code	Course	Teaching Scheme				Semester End Examination (SEE) - A					Continuous Assessment (CA) - B					Aggregate (A+B)	Credits Earned				
			Theory (Hrs)	Practical (Hrs)	Tutorial (Hrs)	Credits	Duration (Hrs)	Theory	Oral	Pract	Oral & Pract	SEE Total (A)	Term Test 1 (TT1)	Term Test 2 (TT2)	Term Test 3 (TT3)	Term Test Total (TT1 + TT2 + TT3)	Term Work	CA Total (B)				
<b>SEM III</b>																						
1	DJS23SH2201	Foundations of Business Intelligence and Analytics	4	--	--	4	2	60	--	--	--	60	15	15	10	40	--	40	100	4	4	
<b>SEM IV</b>																						
2	DJS23SH2251	Advanced Tools and Techniques in Business Intelligence	3	--	--	3	2	60	--	--	--	60	15	15	10	40	--	40	100	3	4	
	DJS23SH2251L	Advanced Tools and Techniques in Business Intelligence Laboratory	--	2	--	1	--	--	--	--	--	--	--	--	--	--	25	25	25	1		
<b>SEM V</b>																						
3	DJS23SH2301	Advanced Business Intelligence and Decision Support	3	--	--	3	2	60	--	--	--	60	15	15	10	40	--	40	100	3	4	
	DJS23SH2301L	Advanced Business Intelligence and Decision Support Laboratory	--	2	--	1	--	--	--	--	--	--	--	--	--	--	25	25	25	1		
<b>SEM VI</b>																						
4	DJS23SH2351	Applied Business Intelligence and Advance Analytics	4	--	--	4	2	60	--	--	--	60	15	15	10	40	--	40	100	4	4	
<b>SEM VIII</b>																						
5	DIS23SH2451P	Business Intelligence Capstone Project	--	4	--	2	2					50	50				25	25	75	2	2	
<b>Total</b>			14	8	0	18	10	240				50	290	60	60	40	160	75	235	525	18	18

  
Prepared by

  
Checked by

  
Head of the Department

  
Vice Principal

  
Principal

Course: Advanced Business Intelligence and Analytics Tools (DJS23SH2251)

Course: Advanced Business Intelligence and Analytics Laboratory (DJS23SH2251L)

**Pre-requisite:**

Foundation of Business Intelligence and Analytics, Python

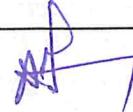
**Course Objectives:** The Objectives of course are:

1. To build foundational proficiency in Business Intelligence tools starting from basic concepts to advanced implementation.
2. To develop practical skills in data visualization, transformation, and analytics using Power BI and Tableau.
3. To enable students to design, develop, and deploy comprehensive BI solutions for business decision support.

**Course Outcomes:** On successful completion of this course, student should be able to

1. Understand BI architecture and select appropriate tools for different business scenarios.
2. Create basic to intermediate visualizations and dashboards using Power BI and Tableau.
3. Perform advanced data engineering using Power Query, M Language, and Python integration.
4. Implement business analytics using DAX formulas, time intelligence, and Python scripts.
5. Develop interactive dashboards with Python integration in both Power BI and Tableau.
6. Design and implement end-to-end BI solutions using multi-platform strategies

<b>Advanced Tools and Techniques in Business Intelligence (DJS23SH2251)</b>		
<b>Unit</b>	<b>Description</b>	<b>Duration</b>
1	<b>Introduction to BI Tools</b> BI lifecycle and architecture, Data Integration across multiple sources (ERP, CRM, social media), BI tools for different information system level (MIS, TPS, DSS, ESS), Role of BI in descriptive and diagnostic analytics, Case Study: BI adoption in Indian organizations (e.g., Tata Steel, HDFC Bank).	06
2	<b>Power BI Foundation and Basic Visualization</b> Power BI Desktop interface and workspace navigation, Connecting to various data sources (Excel, CSV, Web), Basic data transformation using Power Query Editor, Core visualization types and when to use them (Bar, Line, Pie, Map, Table, Matrix, Card), Basic formatting and layout design, Filters and slicers implementation, Creating simple interactive dashboards, Publishing to Power BI Service.	08
3	<b>Advanced Data Engineering with Power BI</b> Power Query Deep Dive: M Language fundamentals, custom functions and parameters, Advanced merging techniques (fuzzy matching, different join types), Error handling and data quality checks, Performance optimization (query folding, data model sizing), Database connectivity (SQL Server, MySQL, DirectQuery vs Import strategies), Basic Python integration for data transformation.	07



4	<b>Power BI Analytics &amp; DAX Fundamentals</b> Introduction to Data Analysis Expressions (DAX), Measures vs Calculated Columns, Essential DAX functions (SUM, AVERAGE, COUNT, CALCULATE, FILTER), Time intelligence functions (YTD, QTD, MTD, SAMEPERIODLASTYEAR), Basic filter context understanding, Creating business KPIs (Revenue, Profit, Growth Rate), Introduction to Power BI Service features, Mobile report optimization.	07
5	<b>Tableau Foundation &amp; Basic Analytics</b> Tableau Desktop interface and workspace, Connecting to data sources and data preparation, Basic visualization types and chart selection, Filters, parameters, and sets, Introduction to calculated fields, Groups, hierarchies, and sorting, Basic dashboard creation and layout, Story points for data storytelling, Comparative analysis: Power BI vs Tableau approach differences.	07
6	<b>Multi-Platform Strategy</b> BI tool selection framework and evaluation criteria, Introduction to Qlik Sense associative analytics, Looker Studio for rapid dashboard development, Cloud BI platforms overview (Power BI Service, Tableau Online), Emerging trends in BI (AI-powered analytics, Natural Language Query), BI ethics, governance and data security, Capstone project planning and implementation guidance.	07
	<b>Total</b>	42

### List of Experiments:

1. To study and implement the BI lifecycle by integrating data from multiple sources.
2. To design and develop a basic interactive business dashboard using Power BI.
3. To perform data cleaning and transformation using Power Query Editor.
4. To connect Power BI with SQL databases and compare Import vs DirectQuery modes.
5. To create business KPIs using DAX measures and calculated columns.
6. To apply DAX Time Intelligence functions for time-based analytics.
7. To build interactive dashboards and story points using Tableau.
8. To perform advanced analytical operations in Tableau using calculated fields and parameters.
9. To develop dashboards using Qlik Sense or Looker Studio and evaluate cross-platform BI features.
10. To implement an end-to-end BI mini-project from data integration to dashboard reporting.

Minimum eight experiments from the above suggested list or any other experiment based on syllabus will be included, which would help the learner to apply the concept learnt.

### Books Recommended:

#### Textbooks:

1. *Ferrari and M. Russo, The Definitive Guide to DAX, 2nd ed. Redmond, WA, USA: Microsoft Press, 2019.*
2. *G. Raviv, Collect, Combine, and Transform Data Using Power Query in Excel and Power BI. Redmond, WA, USA: Microsoft Press, 2022.*
3. *J. N. Milligan, Learning Tableau 2022, 5th ed. Birmingham, UK: Packt Publishing, 2022.*
4. *R. Sleeper, Practical Tableau: 100 Tips, Tutorials, and Strategies from a Tableau Zen Master. Sebastopol, CA, USA: O'Reilly Media, 2018.*
5. *M. O'Donovan, Qlik Sense for Beginners: An introduction to the core features of Qlik Sense for building analytics and dashboards. Birmingham, UK: Packt Publishing, 2020.*

### Reference Books:

1. R. Sherman, *Business Intelligence Guidebook: From Data Integration to Analytics*. Waltham, MA, USA: Morgan Kaufmann, 2014.
2. B. Marr, *Data Strategy: How to Profit from a World of Big Data, Analytics and the Internet of Things*, 2nd ed. London, UK: Kogan Page Publishers, 2022.
3. C. N. Knaflic, *Storytelling with Data: A Data Visualization Guide for Business Professionals*. Hoboken, NJ, USA: Wiley, 2015.
4. R. Kimball and M. Ross, *The Data Warehouse Toolkit: The Definitive Guide to Dimensional Modeling*, 3rd ed. Hoboken, NJ, USA: Wiley, 2013.
5. F. Provost and T. Fawcett, *Data Science for Business: What You Need to Know About Data Mining and Data-Analytic Thinking*. Sebastopol, CA, USA: O'Reilly Media, 2013.

### Web Links:

1. Microsoft Power BI Documentation, Microsoft Corporation, 2024: <https://learn.microsoft.com/en-us/power-bi/>
2. Tableau Help and Learning, Salesforce, Inc: [https://help.tableau.com/current/guides/everybody-get-started/en-us/everybody\\_getstarted.htm](https://help.tableau.com/current/guides/everybody-get-started/en-us/everybody_getstarted.htm)
3. Qlik Sense Help, QlikTech International AB, 2024: <https://help.qlik.com/en-US/sense>
4. Looker Studio Help, Google LLC, 2024: <https://support.google.com/looker-studio/>
5. Business Intelligence (BI) Essentials: <https://www.coursera.org/learn/business-intelligence-essentials>

### Evaluation Scheme:

#### Semester End Examination (A):

##### Theory:

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

#### Continuous Assessment (B):

##### Theory:

- i. Term Test 1 (based on 40 % syllabus) of 15 marks for the duration of 45 min.
- ii. Term Test 2 (on next 40 % syllabus) of 15 marks for the duration of 45 min.
- iii. 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 :15 Marks.
  - ii. Mini Project: 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

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