Shirpur Education Society's

R. C. Patel Institute of Technology, Shirpur

(An Autonomous Institute)

Course Structure and Syllabus

Honors Degree Program in Business Intelligence

Artificial Intelligence (AI) and Data Science

With effect from Year 2025-26

Shahada Road, Near Nimzari Naka, Shirpur, Maharashtra 425405
Ph: 02563 259 802, Web: www.rcpit.ac.in

Honors Degree Program in Business Intelligence (w.e.f. 2025-26)

Sr	Course Category	Course Code	Course Title	Teaching Scheme			Evaluation Scheme					Total	Credit	
							Continuous Assessment (CA)							
							TA	Term Test 1 (TT1)	Term Test 2 (TT2)	Average of (TT1 & TT2)	ESE			
				L	T	P	[A]			[B]	[C]	[A+B+C]		
Sem-III														
1	H1	RCP23SH1301	Foundations of Business Intelligence and Analytics	4			25	15	15	15	60	100	4	4
Sem-IV														
2	H1	RCP23SH1401	Advanced Tools and Techniques in Business Intelligence	3			25	15	15	15	60	100	3	4
	H1	RCP23SH1401L	Advanced Tools and Techniques in Business Intelligence Laboratory			2	25					25	1	
Sem-V														
3	H1	RCP23SH1501	Advanced Business Intelligence and Decision Support	3			25	15	15	15	60	100	3	4
	H1	RCP23SH1501L	Advanced Business Intelligence and Decision Support Laboratory			2	25					25	1	
Sem-VI														
4	H1	RCP23SH1601	Applied Business Intelligence and Advance Analytics	4			25	15	15	15	60	100	4	4
Sem-VIII														
5	H1	RCP23SH1801	Business Intelligence Capstone Project			4	25				50	75	2	2
			Total	14		8	175			60	290	525	18	

Prepared by:	Prof. Dr. D. R. Patil	Prof. Dr. P. J. Deore
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Prof. T. A. Tayde	C.O.E.	Director

Semester - IV

Program: Artificial Intelligence (AI) and Data Science Honors in Business Intelligence	S. Y. B.Tech	Semester: IV
Advanced Tools and Techniques in Business Intelligence (RCP23SH1401)		
Advanced Tools and Techniques in Business Intelligence Laboratory (RCP23SH1401L)		

Pre-requisite:

of Business Intelligence and Analytics, Python .

Course Objective(s):

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.

CO	Course Outcomes	Blooms Level	Blooms Description
CO1	Understand BI architecture and select appropriate tools for different business scenarios.	L3	Apply
CO2	Create basic to intermediate visualizations and dashboards using Power BI and Tableau.	L6	Create
CO3	Perform advanced data engineering using Power Query, M Language, and Python integration.	L2	Understand
CO4	Implement business analytics using DAX formulas, time intelligence, and Python scripts.	L4	Analyse
CO5	Develop interactive dashboards with Python integration in both Power BI and Tableau.	L6	Create
CO6	Design and implement end-to-end BI solutions using multi-platform strategies.	L6	Create

Advanced Tools and Techniques in Business Intelligence (RCP23SH1401) Course Contents

Unit-I 07 Hrs.

Introduction to BI Tools : 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).

Unit-II 07 Hrs.

Power BI Foundation and Basic Visualization : 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.

Unit-III 07 Hrs.

Advanced Data Engineering with Power BI : 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.

Unit-IV 07 Hrs.

Power BI Analytics DAX Fundamentals: 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.

Unit-V 07 Hrs.

Tableau Foundation Basic Analytics : 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.

Unit-VI 07 Hrs.

Multi-Platform Strategy: 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.

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.

Text Books:

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.