INSTITUTE OF AERONAUTICAL ENGINEERING
(Autonomous)
Dundigal - 500 043, Hyderabad, Telangana

COURSE CONTENT

BUSINESS INTELLIGENCE								
VI Semester: CSE(DS)								
Course Code	**Category**	**Hours / Week**			**Credits**	**Maximum Marks**		
ACDD18	**Open Elective**	**L**	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
		3	0	0	3	40	60	100
Contact Classes: 48	**Tutorial Classes: Nil**	**Practical Classes: Nil**				**Total Classes: 48**		
Prerequisites: Basic knowledge of databases, data warehousing, and programming or data analysis tools.								

I. COURSE OVERVIEW:

Business Intelligence (BI) refers to technologies, applications, and practices for the collection, integration, analysis, and presentation of business information. The purpose of business intelligence is to support better business decision making. This course introduces the fundamentals of business intelligence, architecture and applications in various fields of business such as marketing, customer relations, transaction processing and so on. This course equips a business manager or a business analyst with the knowledge and application skills of data exploration and analysis techniques and tools to achieve business goals.

II. COURSE OBJECTIVES:

The students will try to learn:

I. The foundational principles and architecture of Business Intelligence systems, including their role in decision support.
II. The integration and transformation of organizational data using ETL (Extract, Transform, Load) processes and data warehousing concepts.
III. The application of OLAP (Online Analytical Processing), data mining, and analytical modeling for trend analysis and forecasting.
IV. The use of BI tools for creating dashboards, reports, and visualizations that aid decision-making across various business functions.

III. COURSE OUTCOMES:

CO1 **Explain** the architecture, components, and objectives of Business Intelligence systems.
CO2 **Apply** ETL processes to integrate and transform organizational data for analysis.
CO3 **Design** star and snowflake schemas for data warehouses to support multidimensional data analysis.
CO4 **Perform** OLAP operations such as roll-up, drill-down, slicing, and dicing for effective data exploration.
CO5 **Develop** interactive dashboards and visual analytics using BI tools like Tableau, Power BI, or equivalent.
CO6 **Assess** the impact of BI strategies on organizational decision-making and performance.

IV. COURSE CONTENT:

MODULE -I: INTRODUCTION (09)

Introduction to Business Intelligence (BI), Essential Aspects, Data, information and knowledge, The role of mathematical models, BI architecture, Cycle of a BI analysis, Enabling factors in BI projects, Ethics and BI. Definition of a Decision support system, Development of decision support system.

MODULE –II: DATA MINING APPLICATIONS IN MARKETING AND CUSTOMER RELATIONSHIP MANAGEMENT (09)

Direct Marketing: Identifying Good Prospects, Improve Direct Marketing Campaigns, Response Modeling, optimizing for a Fixed Budget, Optimizing for Campaign Profitability, Differential Response Analysis.

Customer Relationship Management: Methods, Improving Collections, Customer Value, Cross-selling, Up-selling, Retention and Churn, kinds of Churn, Churn Models and prediction.

MODULE-III:BASKET ANALYSIS AND SURVIVAL ANALYSIS IN MARKETING (12)

Basket analysis: Defining Market Basket Analysis, Association Rules, How Good Is an Association Rule, Building Association Rules, Using Association Rules to Compare Stores, Dissociation Rules.

Sequential Analysis Using Association Rules. Survival analysis: Customer Retention, Hazards, From Hazards to Survival, Proportional Hazards, Survival Analysis in Practice.

MODULE-IV: DATA MINING THROUGH CUSTOMER LIFE CYCLE (09)

Levels of the Customer Relationship, Customer Life Cycle and Stages, Subscription Relationships versus Event-Based Relationships, Customer Acquisition, Customer Activation, Relationship Management, Customer Retention.

MODULE-V: DATA MINING IN DATA WAREHOUSES & DATA MINING TOOLS (09)

The Architecture of Data, A General Architecture for Data Warehousing, online OLAP and Data Mining, Data Cubes & Types, Data Mining in Data Warehousing, Data Mining Tools: Tableau and power BI, Basic features, Dashboard and Visualization.

V. TEXTBOOKS:

1. Michael J.A. Berry & Gordon S. Linoff, Data Mining Techniques for Marketing, Sales, and Customer Relationship Management, Third/Fourth Edition, 2011.
2. Carlo Vercellis, Business Intelligence: Data Mining and Optimization for Decision Making (WSE), Student Edition, Wiley India, 2009.
3. Drew Bentley (editor), Business Intelligence and Analytics}, Library Press, New York, 2017.

VI. REFERENCE BOOKS:

1. Chun-houh Chen, Wolfgang Härdle Antony Unwin, Handbook of Data Visualizations, Springer, 1st Edition, 2017.
2. Robert Hoyt, Robert Muenchen, Data Preparation and Exploration: Applied to Healthcare Data, PHI Learning Private Ltd., 5th Edition, 2012.
3. Claus O. Wilke, Fundamentals of Data Visualization, April 2019.

VII. ELECTRONICS RESOURCES:

1. https://www.analyticsvidhya.com/blog/2021/08/exploratory-data-analysis-and-visualization-techniques-in- data-science/
2. https://www.geeksforgeeks.org/what-is-data-exploration-and-its-process/
3. https://medium.com/@pabbakavya123/a-comprehensive-guide-on-exploratory-data-analysis-eda- ab38f33d6abc
4. https://support.sas.com/resources/papers/proceedings/proceedings/sugi28/120-28.pdf
5. https://www.prooveintelligence.com/blog/understanding-customer-churn-with-survival-analysis/
6. https://www.geeksforgeeks.org/difference-between-olap-and-oltp-in-dbms/
7. https://blog.bismart.com/en/data-warehousing-olap-oltp

VIII. MATERIALS ONLINE

1. Course template
2. Tutorial question bank
3. Tech talk topics
4. Open-ended experiments
5. Definitions and terminology
6. Assignments
7. Model question paper – I
8. Model question paper – II
9. Lecture notes
10. PowerPoint presentation
11. E-Learning Readiness Videos (ELRV)