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Course Introduction: At the heart of analytics lies the belief, "The unexamined decision isn't worth making," as argued by Davenport *et. al* in their book "Analytics at work: Smarter decisions: better results." The massive amount of data generated all around us has enabled a completely objective way of decision making. Leveraging of this data to make sound business decisions while pricing products, maintaining inventory, recruiting talent and a multitude of other situations contributes towards improving efficiency, managing risk and enhancing profit. The course intends to enable the student to rise above the functional silos and grasp the holistic relevance of analytics in competing for the future. A synergistic amalgamation of theoretical and hands-on approach would make you competent to use the tools to decipher big data. The underlying objective is to create managers who can utilize analytics to improve performance in key business domains by disseminating information and generating insight.

Course Objectives: The specific objectives of the course are-
- To enhance the theoretical understanding of students on various concepts of analytics.
- To understand SAP Netweaver Business Warehouse as the data staging for Business Analytics
- To expose students to data visualization techniques using SAP Lumira Cloud and SAP Dashboard.
- To expose students to a set of predictive, optimization and stochastic tools.
- To enhance the efficiency of students in using software for extracting information and generating insight.
- To familiarize students with data mining concepts and techniques.
- To get an understanding of how to decide when to use which technique.
- To develop the competency of assessing a predicament and choosing the appropriate tool to arrive at a decision.

Course Pedagogy: The teaching methodology will be an optimum amalgamation of class-room teaching, hands-on experiments and case discussions. A theoretical understanding of the tools will be followed by data-based application of tools and lastly, case-based application.

Course Readings:

<u>**Text book**</u>

Shmueli G, Patel NR and Bruce PC 2008 'Data Mining for Business Intelligence,' Wiley India Pvt. Ltd.

Reference books
1.   Linoff GS and Berry MJA 2011, 'Data Mining Techniques,' Wiley India.
2.   Hanke JE and Wichern DW 2009, 'Business Forecasting,' PHI.
3.   Albright SC and Winston WL 2009, 'Management Science: Modeling with Spreadsheets,' Cengage Learning India Pvt. Ltd.
4.   Hair Jr. JF, Black WC, Babin BJ, Anderson RE and Tatham RL 2006, 'Multivariate Data Analysis,' Pearson Education.
5.   Davenport TH and Harris JG 2007, 'Competing on Analytics: The New Science of Winning,' Harvard Business School Press, Boston, Massachusetts.
6.   Davenport TH, Harris JG and Morison R 2010, 'Analytics at Work: Smarter Decisions, Better Results,' Harvard Business School Press, Boston, Massachusetts.

Analytical tool:

XLMiner, SAS, SPSS and SAP LUMIRA.

Course Evaluation criteria:

Case analysis	20%
Quiz	20%
Mid-term	30%
End-term	30%
Total	**100%**

Session Plan:

Session	Topic		Reading
	Concept	**Application**	
1-2.	Introduction to Business Analytics – Concepts & Applications		➢ Ch. 1 -2 of Shmueli et al. ➢ Ch. 17, 1, 3 & 5 of Linoff & Berry ➢ Business Intelligence: Definitions & Solutions ➢ Introduction to BI
3-4.	Data visualization, Market basket analysis & Association rules.	1. What goes with what: Purchase of cell phone accessories. Purchase of books 2. Housing prices.	➢ Ch. 3 & Ch. 11 of Shmueli et al. ➢ Ch. 15 of Linoff & Berry.
5-6	Automatic cluster detection ➢ Hierarchical Methods. ➢ Non-hierarchical Methods.	Grouping service providers: Public utilities.	➢ Ch. 12 of Shmueli et al. ➢ Ch. 13-14 of Linoff & Berry. ➢ Ch. 6 of Hair et. al.

Session	Topic		Reading
	Concept	**Application**	
7	Naïve Bayes': A classification method	Predicting fraudulent financial reporting.	➢ Ch.6 of Shmueli et al. ➢ Ch. 6 & Ch. 21 of Linoff & Berry
8.	Decision tree analysis	Developing the best bidding strategy.	➢ Ch. 7 of Linoff & Berry. ➢ Ch. 10 of Albright & Winston. ➢ Ch. 14 of Taha.
9.	Classification & regression trees (CART)	Factors influencing acceptance of personal loan.	➢ Ch. 7 of Shmueli et al. ➢ Ch. 7 of Linoff & Berry
10.	Discriminant analysis	Classifying prospects into purchasers and non-purchasers: Riding mowers.	➢ Ch. 10 of Shmueli et al. ➢ Ch. 5 of Hair et al.
11-12.	Binary Logistic Regression	Classifying products into good and poor quality: Predicting delayed flights.	➢ Ch. 8 of Shmueli et al. ➢ Ch. 5 of Hair *et. al.* 2006.
13-14.	Artificial Neural Network	Customer service prioritization: Classifying accident severity.	➢ Ch. 9 of Shmueli et al. ➢ Ch. 8 of Linoff & Berry.
15-16.	Forecasting ➢ Moving averages. ➢ Exponential smoothing. ➢ Trend, Cyclical and seasonal components.	Forecasting sales: Mr. Tux.	➢ Reading material. ➢ Ch. 1, 4 & 5 of Hanke & Wichern.
17.	Forecasting ➢ Regression with time-series data	Forecasting sales: Mr. Tux.	➢ Reading material. ➢ Ch. 8 of Hanke & Wichern. ➢ Ch. 12 of Linoff & Berry.
18.	Business perspective of Business Analytics ➢ Competitive advantage. ➢ DELTA.		➢ Reading material. ➢ Davenport & Harris 2010, pp. 1-22.

SAP BA Certification Module		
19-20	Multidimensional Reporting using SAP Business Warehouse	**Case Study -1** **Exercise – 1**
21-22	Building Business Warehouse using SAP tools for BA	**Case Study – 2** **Readings:** • The Data Warehouse • The Basics of Analytics • Competing on Analytics
23-25	SAP BA Data Modeling tools & techniques including ETL Process	**Case Study – 3**
26-27	Dimension reduction, Survival analysis & Social media analytics	Factors influencing consumption of products: Breakfast cereals.	➢ Ch. 3 of Shmueli et al. ➢ Ch. 10 of Linoff & Berry ➢ Big Data Meets Big Data Analytics
28-30	SAP Enterprise Mining, Visualization & Reporting	**Case Study – 4 & Exercise - 2**

Note:

1. *SAP BA Certification Module will be integrated within the course and some of these classes will be held during weekends depending on the availability of the computer lab and concerned Faculty. All the case studies and exercises are hands-on, which will be distributed as a learning kit. Each student is supposed to complete all the exercises, case studies and write quizzes/exam to qualify for SAP certification.*

2. *Knowledge of basic statistics is an essential prerequisite to this course. The instructor will provide other cases and problems as and when needed. Students are expected to come prepared for the class.*