OTM-822 Business Intelligence

1. Big data is noted for its volume, varieties of data types, and rapid accumulation. Big data has become a catchphrase to describe data collections that are so large they are not amenable to processing or analysis using traditional database and software techniques. Modern enterprises are producing huge amount of data, which is either underutilized or not used at all for day-to-day decision-making. Whether you are tracking the efficiency of a warehouse or predicting how and when to modify staffing levels in a call centre, this course equips you with the essential knowledge and skills required for effective decision-making in routine business setting. You will learn to derive value from vast amounts of untapped data and apply data analytics techniques for smart, data-driven decision-making.

2. To successfully compete in today's global business environment an organization must constantly monitor, recognize and understand every aspect and every issue of its operations, its industry and the overall business environment. This course focuses on business intelligence – an information technology approach to data collection and data analysis to support a wide variety of management tasks, from performance evaluation to trend spotting and policy making. Students learn analytical components and technologies used to create dashboards and scorecards, data/text/Web mining methods for trend and sentiment analysis, and artificial intelligence techniques used to develop intelligent systems for decision support.

Content

3. This course will provide a general overview of the principles, concepts, techniques, tools and services for managing, harmonizing, aggregating, pre-processing, modelling, analysing and interpreting large, multi-source, incomplete, incongruent, and heterogeneous data (Big Data). The focus will be to expose students to common challenges related to handling Big Data and present the enormous opportunities and power associated with our ability to interrogate such complex datasets, extract useful information, derive knowledge, and provide actionable forecasting. Biomedical, healthcare, and social datasets will provide context for addressing specific driving challenges. Students will learn about modern data analytic techniques and develop skills for importing and exporting, cleaning and fusing, modeling and visualizing, analysing and synthesizing complex datasets. The collaborative design, implementation, sharing and community validation of high-throughput analytic workflows will be emphasized throughout the course.

Objectives

4. The overall objective of this course is to develop expertise in managing and analysing big data. This is disintegrated into following individual objectives:

   a. Articulate modern concepts, theories, and research in the field of Business Intelligence (BI).

   b. Introduction to big data and visualization of real-world problems

   c. Study, practice, and implement statistical models and machine learning algorithms for the purpose of Big Data analytics.

   d. Provide students with hands-on-experience in analysing large volumes of unstructured data.

   e. Acquire working knowledge on “from data to decision”.

Outcomes

5. Upon successful completion of this course, students should be able to:

   a. Create competitive advantage from both structured and unstructured data

   b. Predict outcomes with supervised machine learning techniques

   c. Unearth patterns in customer behaviour with unsupervised techniques

   d. Work with R and Hadoop to analyse structured, unstructured, and big data

6. **Text and reference books**

   a. Business Intelligence and Analytics. Systems for Decision Support, 10th Edition. R. Sharda, D. Delen, & E. Turban; Pearson/Prentice Hall, © 2015. ISBN-13: 978-0-13-305090-5,

   b. Data Mining: Practical Machine Learning Tools and Techniques (2016) Ian H. Witten, Eibe Frank, Mark A. Hall, and Christopher J. Pal.

   c. Big Data Analytics: Methods and Applications (2016) by Saumyadipta Pyne, B.L.S. Prakasa Rao, and S.B. Rao.

   d. Data Science for Business: What You Need to Know about Data Mining and Data-Analytic Thinking (2013) by Foster Provost and Tom Fawcett

   e. Understanding Big Data: Analytics for Enterprise Class Hadoop and Streaming Data (2011) by Paul Zikopoulos and Chris Eaton.

Mining of Massive Datasets (2011) by Anand Rajaraman and Jeffrey David Ullman. Cambridge University Press