# 19CS4102 - DATA ANALYTICS

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| **Course Category:** | Professional Core  | **Credits:** | 3 |
| **Course Type:** | Theory | **Lecture – Tutorial – Practical:** | 3-0-0 |
| **Prerequisite:** | Basic concepts of Data base Management Systems and Knowledge of Probability and Statistics | **Sessional Evaluation:****Univ. Exam Evaluation:****Total Marks:** | 4060100 |
| **Objectives** | * To learn the principles and methods of statistical analysis
* Discover interesting patterns, analyze supervised and unsupervised models and

estimate the accuracy of the algorithms.* To understand the techniques of time series and text analysis.
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| **Course Outcomes** | Upon the successful completion of the course, the students will be able to: |
| CO1 | Understand the importance of learning the basics of Big Data analytics  |
| CO2 | Learn the fundamentals of R and Hadoop to develop simple data analysis applications |
| CO3 | Learn and understand the various statistical methods |
| CO4 | Understand the basic concepts of supervised and unsupervised models |
| CO5 | Study and understand the time series analysis  |
| CO6 | Learn and understand the text analysis and sentiment analysis. |
| **Course Content** | UNIT-I**Introduction to Big Data Analytics:** Big Data Overview, State of the Practice in Analytics, Key Roles for the New Big Data Ecosystem, Examples of Big Data Analytics.**Data Analytics Life Cycle:** Data Analytics Lifecycle Overview, Discovery, Data Preparation, Model Planning, Model Building, Communicate Results, Operationalize, Case Study: Global Innovation Network and Analysis (GINA).UNIT-II**Analytic Methods Using R:**Introduction to R, Exploratory Data Analysis, Statistical Methods for Evaluation.**Advanced Analytics:** Analytics for Unstructured Data- MapReduce and Hadoop, The Hadoop Ecosystem, SQL essentials.UNIT-III**Regression:**Categorical Variable, Linear Regression, Logistic Regression, Ordinary Least Squares (OLS), Receiver Operating Characteristic (ROC) Curve, Residuals. UNIT-IV**Clustering:**Overview, K-Means, PAM, Density-Based Clustering**Classification:** Decision Tress, Naïve Bayes, Diagnostics of ClassifiersUNIT-V**Time Series Analysis:** Overview, ARIMA Model, Building and evaluating ARIMA Model, Additional Methods-ARMAX,GARCHUNIT –VI**Text Analysis:**Text Analysis Steps, Collecting Raw Text, Representing Text, Term Frequency-Inverse Document Frequency (TDIDF), Categorizing Documents by Topics, Determining Sentiments, Gaining Insights. |
| **Text Books and References** | **TEXT BOOKS:**1. Data Science & Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data by EMC2 Education Services, Published by John Wiley & Sons, Inc.

**REFERENCE BOOKS:**1. Data Mining Concepts and Techniques, Han, Kamber, 3rd Edition.
2. Student’s Handbook for Associate Analytics – II, III.
3. Data Science & Big Data Analytics: ICT ACADEMY by DELL EMC.
4. Mining of Massive Datasets, Jure Leskovec Stanford Univ. AnandRajaraman

Milliway Labs Jeffrey D Ullman Stanford Univ. |
| **E-Resources** | 1. https://nptel.ac.in/courses
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