

Big Data Analytics	Code & No:	CS 471
	Credits:	3(3+1+0)
	Pre-requisite:	STAT102
	Co-requisite:	
	Level:	9 or 10

Course Description: This course is designed for students who have no previous knowledge of data analytics but wish to acquire these skills in a short period of time. These students will learn how to analyze large data sets and identify patterns that will improve any company's and organization decision-making process.

Course Aims: After completing the course, they will be able to:

- Capture, categorize, simplify, normalize and prepare data to be processed
- Work with and analyze large data sets
- Visually represent analysis's conclusions to technical and non-technical audiences
- Use the most common algorithms, to make sense of large amounts of data, which are applicable to most business and management problems.

- Course Learning Outcomes (CLOs):**
1. To understand the basics of big data analytics
 2. To understand the data sampling, statistical analysis, visual data exploration
 3. To apply predictive analytics techniques for real time problems
 4. To perform descriptive and social analytics
 5. To use big data tools and techniques

No.	Topics	Weeks	Teaching hours
1	Big Data and Analytics- Example Applications, Basic Nomenclature, Analytics Process Model, Analytics, Analytical Model Requirements	1	3
2	Data Collection, Sampling and Preprocessing- Types of Data Sources, Sampling, Types of Data Elements, Visual Data Exploration and Exploratory Statistical Analysis, Missing Values, Outlier Detection and Treatment, Standardizing Data, Categorization	2	6

3	Predictive Analytics- Linear Regression, Logistic Regression, Decision Trees, Neural Networks, Support Vector Machines, Ensemble Methods, Multiclass Classification Techniques, Evaluating Predictive Models	3	9
4	Descriptive Analytics- Association Rules, Sequence Rules, Segmentation	1	3
5	Social Network Analytics- Social Network Definitions, Social Network Metrics, Social Network Learning, Relational Neighbor Classifier, Probabilistic Relational Neighbor Classifier	2	6
6	Analytics: Putting It All to Work- Back testing Analytical Models, Benchmarking, Data Quality, Software Privacy, Model Design and Documentation	1	3
7	Example Applications: Credit Risk Modeling, Fraud Detection, Recommender Systems, Web Analytics, Social Media Analytics	2	6
8	Big Data Tools and Techniques- Understanding Big Data Storage, A General Overview of High-Performance Architecture, HDFS, MapReduce and YARN, Zookeeper, HBase, Hive, Pig, Mahout, NoSQL	2	6
	Total	14	42

Textbook:

- Bart Baesens - Analytics in a Big Data World_ The Essential Guide to Data Science and its Applications,Wiley,2014
- David Loshin, Big Data Analytics: From Strategic Planning to Enterprise Integration with Tools, Techniques, NoSQL, and Graph,Elsevier, 2013, ISBN: 978-0-12-417319-4

Essential References:

- Judith Hurwitz, Alan Nugent, Fern Halper, Marcia Kaufman - Big Data For Dummies (2013, For Dummies)