

**SWARNANDHRA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)**

**SEETHARAMPURAM, NARSAPUR-534280, WG- DT, AP
DEPARTMENT OF MASTER OF COMPUTER APPLICATIONS**

TEACHING PLAN

Course Code	Course Title	Year / Sem	Branch	Contact Hr/ week	Academic Year
24MC3T03	BIG DATA TECHNOLOGIES	II/I	MCA	6	2025-26

Course objectives:

The main objective of this course is to implement Map Reduce programs for processing big data, realize storage and processing of big data using MongoDB, Pig, Hive and Spark and analyze big data using machine learning techniques.

Course Outcomes (COs): At the end of the course, student will be able to

CO	Course Outcomes	Knowledge Level (K)
CO1	Explain the classification, characteristics, and evolution of Big Data; compare traditional BI with Big Data; and describe Big Data analytics tools and technologies.	K2
CO2	Apply Hadoop concepts including HDFS, YARN, and MapReduce programming to process and manage large-scale data efficiently.	K3
CO3	Analyze the features, data types, and query mechanisms of MongoDB to model and manage unstructured data effectively.	K4
CO4	Evaluate and implement Hive and Pig for data warehousing and processing, including query design, UDFs, and data transformation techniques.	K5
CO5	Design Big Data applications using Apache Spark, and create solutions for text, web content, and link analytics including PageRank and graph analysis.	K6

UNIT	Outcomes	Blooms Level	TOPIC/ACTIVITY	Text Books	Contact HOURS	Delivery Method
I	Explain the classification, characteristics, and evolution of Big Data;	K2	UNIT-I			Chalk & Board,
			1.1	Classification of data	T1	1
			1.2	Characteristics, Evolution and definition of Big data	T1	2
			1.3	What is Big data, Why Big data	T1	1

	compare traditional BI with Big Data; and describe Big Data analytics tools and technologies.		1.4	Traditional Business Intelligence Vs Big Data	T1	1	Digital Board & PPT Programming Demonstration
			1.5	Typical data warehouse and Hadoop environment	T1	1	
			1.6	What is Big data Analytics	T1	1	
			1.7	Classification of Analytics	T1	1	
			1.8	Importance of Big Data Analytics	T1	1	
			1.9	Technologies used in Big data Environments	T1	2	
			1.10	Few Top Analytical Tools	T1	1	
			1.11	NoSQL,	T1	2	
			1.12	Hadoop.	T1	2	
II	Apply Hadoop concepts including HDFS, YARN, and MapReduce programming to process and manage large-scale data efficiently.	K3	UNIT-II				Chalk & Board, Digital Board & PPT Programming Demonstration
			2.1	Introducing hadoop	T1	1	
			2.2	Why hadoop, Why not RDBMS	T1	1	
			2.3	RDBMS Vs Hadoop	T1	1	
			2.4	History of Hadoop	T1	1	
			2.5	Hadoop overview, Use case of Hadoop	T1	1	
			2.6	HDFS (Hadoop Distributed File System)	T1	2	
			2.7	Processing data with Hadoop	T1	1	
			2.8	Managing resources and applications with Hadoop YARN(Yet Another Resource Negotiator).	T1	1	
			2.9	Introduction to Map Reduce Programming: Introduction	T1	1	
			2.10	Mapper, Reducer	T1	1	
			2.11	Combiner, Partitioner	T1	1	
			2.12	Searching, Sorting, Compression.	T1	1	
III	Analyze the features, data types, and query mechanisms of MongoDB to model and manage unstructured data effectively.	K4	UNIT-III				Chalk & Board, Digital Board & PPT
			3.1	Introduction to MongoDB: What is MongoDB	T1	1	
			3.2	Why MongoDB	T1	1	
			3.3	Terms used in RDBMS and MongoDB	T1	2	
			MID I				
3.4	Data Types inMongoDB	T1	2				

			3.5	MongoDB Query Language	T1	2	Programming Demonstration
IV	Evaluate and implement Hive and Pig for data warehousing and processing, including query design, UDFs, and data transformation techniques.	K5	UNIT-IV				Chalk & Board, Digital Board & PPT Programming Demonstration
			4.1	Introduction to Hive: What is Hive	T1	1	
			4.2	Hive Architecture	T1	2	
			4.3	Hive data type	T1	1	
			4.4	Hive file formats	T1	1	
			4.5	Hive Query Language (HQL)	T1	1	
			4.6	RC File implementation	T1	1	
			4.7	User Defined Function (UDF)	T1	1	
			4.8	Introduction to Pig: What is Pig	T1	1	
			4.9	Anatomy of Pig	T1	1	
			4.10	Pig on Hadoop	T1	1	
			4.11	Pig Philosophy, Use case for Pig	T1	1	
			4.12	Pig Latin Overview	T1	1	
			4.13	Data types in Pig	T1	1	
			4.14	Running Pig, Execution Modes of Pig	T1	1	
			4.15	HDFS Commands	T1	2	
			4.16	Relational Operators	T1	1	
			4.17	Eval Function, Complex Data Types	T1	2	
			4.18	Piggy Bank, User Defined Function	T1	1	
			4.19	Pig Vs Hive	T1	1	
V	Design Big Data applications using Apache Spark, and create solutions for text, web content, and link analytics including PageRank and graph analysis.	K6	UNIT-V				Chalk & Board, Digital Board & PPT Programming Demonstration
			5.1	Spark and Big Data Analytics: Spark	T2	1	
			5.2	Introduction to Data Analysis with Spark	T2	1	
			5.3	Text, Web Content and Link Analytics: Introduction	T2	1	
			5.4	Text Mining	T2	1	
			5.5	Web Mining	T2	1	
			5.6	Web Content and Web Usage Analytics	T2	1	
			5.7	Page Rank	T2	1	

			5.8	Structure of Web and Analyzing a Web Graph.	T2	1	
Course Beyond Syllabus	Learn real-time Big Data analytics using tools like Apache Kafka and Flink, with machine learning integration.					1	
Total Classes						68	

TextBooks:

S.No.	Author(s)	Title	Publisher	Edition	Year
1	Seema Acharya, Subhashini Chellappan	Big Data and Analytics	Wiley India Publishers	2nd Edition	2019
2	Rajkamal, Preeti Saxena	Big Data Analytics: Introduction to Hadoop, Spark and Machine Learning	McGraw Hill Publication	—	2019

Reference Text Books:

S.No.	Author(s)	Title	Publisher	Edition	Year
1	Adam Shook, Donald Mine	MapReduce Design Patterns: Building Effective Algorithms and Analytics for Hadoop and Other Systems	O'Reilly	—	2012
2	Tom White	Hadoop: The Definitive Guide	O'Reilly Media	4th Edition	2015
3	Thomas Erl, Wajid Khattak, Paul Buhler	Big Data Fundamentals: Concepts, Drivers & Techniques	Pearson India Education Service Pvt. Ltd.	1st Edition	2016
4	John D. Kelleher, Brian Mac Namee, Aoife D'Arcy	Fundamentals of Machine Learning for Predictive Data Analytics: Algorithms, Worked Examples	MIT Press	2nd Edition	2020

e-Resources

- <https://www.kaggle.com/datasets/grouplens/movielens-20m-dataset>
- <https://www.youtube.com/watch?v=bAyrObl7TYE&list=PLEiEAq2VkUUJqp1k-g5W1mo37urJQOdCZ>
- <https://www.youtube.com/watch?v=VmO0QgPCbZY&list=PLEiEAq2VkUUJqp1k-g5W1mo37urJQOdCZ&index=4>
- <https://www.youtube.com/watch?v=GG-VRm6XnNk>
- https://www.youtube.com/watch?v=JglO2Nv_92A

G. Adises
Faculty

Aswani
Head of the Department

[Signature]
Principal