5 Years Integrated M.C.A. (6th Semester)
Teaching Schedule
060060608: DSE9 Introduction to Big Data

Objectives: To introduce the concepts of Big Data, its framework, analytics and technologies for efficient processing of data.

Course Outcomes: Upon completion of the course, students shall be able to

CO1:   Identify characteristics of Big Data and describe its ecosystem.
CO2:   Differentiate file system types of Big Data architecture.
CO3:   Compare and contrast Big Data databases with RDBMS.
CO4:   Use Big Data based data management model.
CO5:   Construct relationship of analytics in Big Data.
CO6:   Describe the use of Big Data in social and business application.

Unit	Sub Unit	No. of Lecture (Hour)	Topics	Reference	Teaching Methodology To be used	Evaluation Parameters
1	**Overview of Big Data and its Framework :**					
	1.1	1	Data, Big Data: Meaning and characteristics	SA#2, Page No:18-21	Discussion , Presentation	
	1.2	1	Types of Data and its source	WP#1, Page No:8-12		
	1.3	1	Big Data Structuring	WP#1, Page No:7-8		
	1.4	1	Elements of Big Data: Volume, Velocity, Variety, Veracity	WP#1, Page No:12-15 SA#2, Page No:22-25	THINK-PAIR-SHARE	
	1.5	1	Distributed and Parallel Computing for Big Data	WP#3, Page No:54-58	Discussion , Presentation	
	1.6	2	Framework and Ecosystem: Introduction, Features and Functions	WP#4, Page No:99-100 SA#5, Page No:98-100		Quiz-1
2	**Big Data File System :**					
	2.1	1	Overview of Big Data File System	WP#4, Page No:86-87 SA#5, Page No:82-85	Audio Visual Presentation, Discussion	
	2.2	1	File System Architecture	WP#4, Page No:87-91		
	2.3	1	Specific File System Types	WP#4, Page No:91-93		
	2.4	2	File System functions and operations	WP#4, Page No:93-94		Unit test-1

3	**Big Data Database :**					
	3.1	2	Relational Model and its Issues	WP#7, Page No:178-184	Discussion , Presentation	
	3.2	1	Non-Relational Database and its Issues	WP#7, Page No:184-186		
	3.3	1	Big Data with Traditional Data Warehouses	WP#7, Page No:187-189		
	3.4	1	Big Data Analysis and Data Warehouse	WP#7, Page No:190-192		
	3.5	1	Deployment Models in Big Data Era	WP#7, Page No:194-195		
4	**NoSQL Data Management :**					
	4.1	1	Characteristics of NoSQL	WP#15, Page No:418-420 SA#4, Page No:58	Chalk and Talk, Discussion and Group Discussion	
	4.2	2	Key Value Data Model	WP#15, Page No:420-421 SA#4, Page No:59		
	4.3	2	Document Databases	WP#15, Page No:423-424 SA#4, Page No:59		Open Book Test
	4.4	1	Schema-Less Databases	WP#15, Page No:426 SA#4, Page No:60		
	4.5	1	CAP Theorem	WP#15, Page No:428-429 SA#3, Page No:49-51		
5	**Big Data Analytics :**					
	5.1	1	Concept of Big Data Analytics	SA#3, Page No:37-38	Discussion , Presentation	
	5.2	1	Classification of Analytics	SA#3, Page No:39-41		
	5.3	1	Business Intelligence, Data Science and Analytics	SA#3, Page No:43-44		
	5.4	2	Challenges to Big Data Analytics	SA#3, Page No:41-42		Unit test-2
6	**Big Data in Business Context :**					
	6.1	2	Big Data in Social Networking	WP#2, Page No:30-32	Discussion	
	6.2	1	Business Intelligence & Marketing	WP#2, Page No:33-35		

| 6.3 | 2 | Detecting & Preventing Fraudulent Activities | WP#2, Page No:36-39 | | |
| 6.4 | 1 | Business Applications | WP#2, Page No:43 -46 | | Internal |

Text Books:
1. Black Book -Big Data, Wiley Pub. **[WP]**
2. Seema Acharya, Subhashini Chellappan – Big Data and Analytics – Wiley **[SA]**

Reference Books:
1. Jared Dean, Big Data, Data Mining and Machine Learning: Value Creation for Business Leaders and Practitioners- Wiley **[JD]**
2. Bart Baesens - Analytics in a Big Data World – Wiley **[BB]**
3. Minelli, Chambers, Dhiray- Big Data Big Analytics – Wiley **[MC]**

Note: # denotes chapter number.

Course Objectives and Course Outcomes Mapping:

To introduce the concepts of Big Data and its framework: CO1,CO2,CO3
Big Data Analytics and technologies for efficient processing of data: CO4,CO5,CO6

Course Units and Course Outcomes Mapping:

Unit No.	Unit	Course Outcome					
		CO1	CO2	CO3	CO4	CO5	CO6
1	Overview of Big Data and its Framework	√					
2	Big Data File System		√				
3	Big Data Database			√	√		
4	NoSQL Data Management			√	√		
5	Big Data Analytics					√	
6	Big Data in Business Context				√		√

Programme Outcomes:

PO1: Proficiency in and ability to identify problems related to computer science as well as design and apply computational knowledge to solve them.

PO2: Ability to design, develop, test and maintain system, component, product or process as per needs and specification.

PO3: Understanding of professional and ethical role and responsibility.

PO4: Recognition of the need for and an ability towards life-long learning

PO5: Knowledge of programming languages, database systems, operating systems, software engineering, Web & Mobile technology and relevant modern issues alongwith strong project development skill.

PO6: Ability to demonstrate the use of modern tools, models and languages to solve problems related to software development

PO7: An ability to communicate effectively with a range of audiences.

Course outcome and programme outcomes mapping:

	CO1	CO2	CO3	CO4	CO5	CO6
PO1	√		√	√		√
PO2		√	√		√	√
PO3					√	√
PO4				√		
PO5			√	√		
PO6	√	√	√	√		√
PO7						

Computing Environment:

A student must have the following computing environment in laboratory and/or on his/her laptop.

❖ Hadoop Framework

Modes of Transaction (Delivery):

Modes of Transaction (Delivery):

Unit No	Topic Detail	Teaching Approach	PO mapped

1	Types of Data	**THINK-PAIR-SHARE** Pose a question, problem, or scenario to students and ask them to think about it individually for a few minutes. Next, allow a student's to form pairs in which they discuss their respective ideas. Invite students to share the results of their paired thinking with the entire class.	PO1,PO2, PO4, PO5,PO6, PO7
4	Working with NoSQL Databases	Group will be selected (voluntary) that consist of 5 students and they will show the use of different NoSQL databases.	PO6, PO7

Activities/Practicum:

The following activities shall be carried out by the students.
- ❖ To study Hadoop Framework
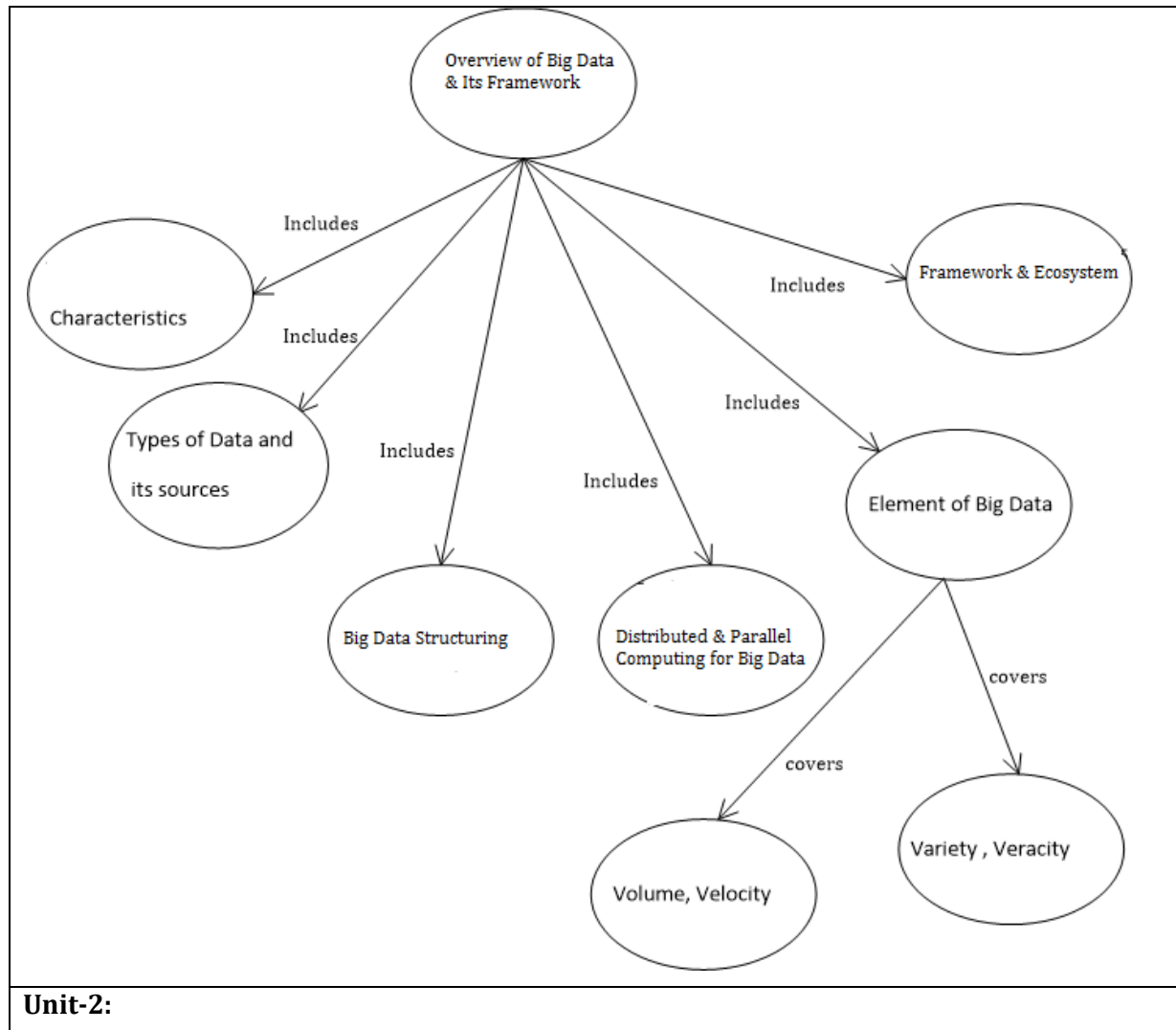- ❖ To study MongoDB and Cassandra databases.

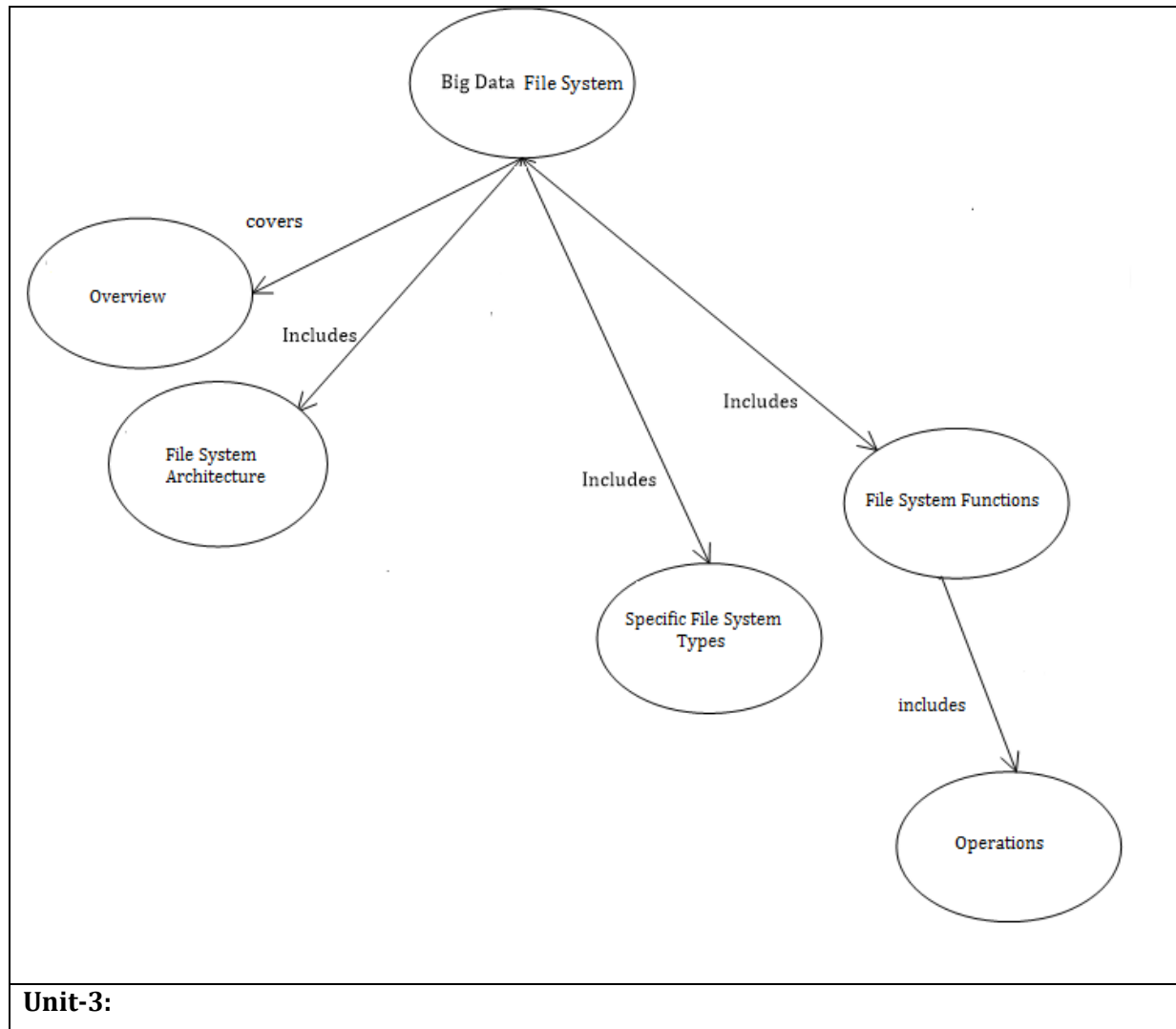The following activities shall be carried out by the teacher:

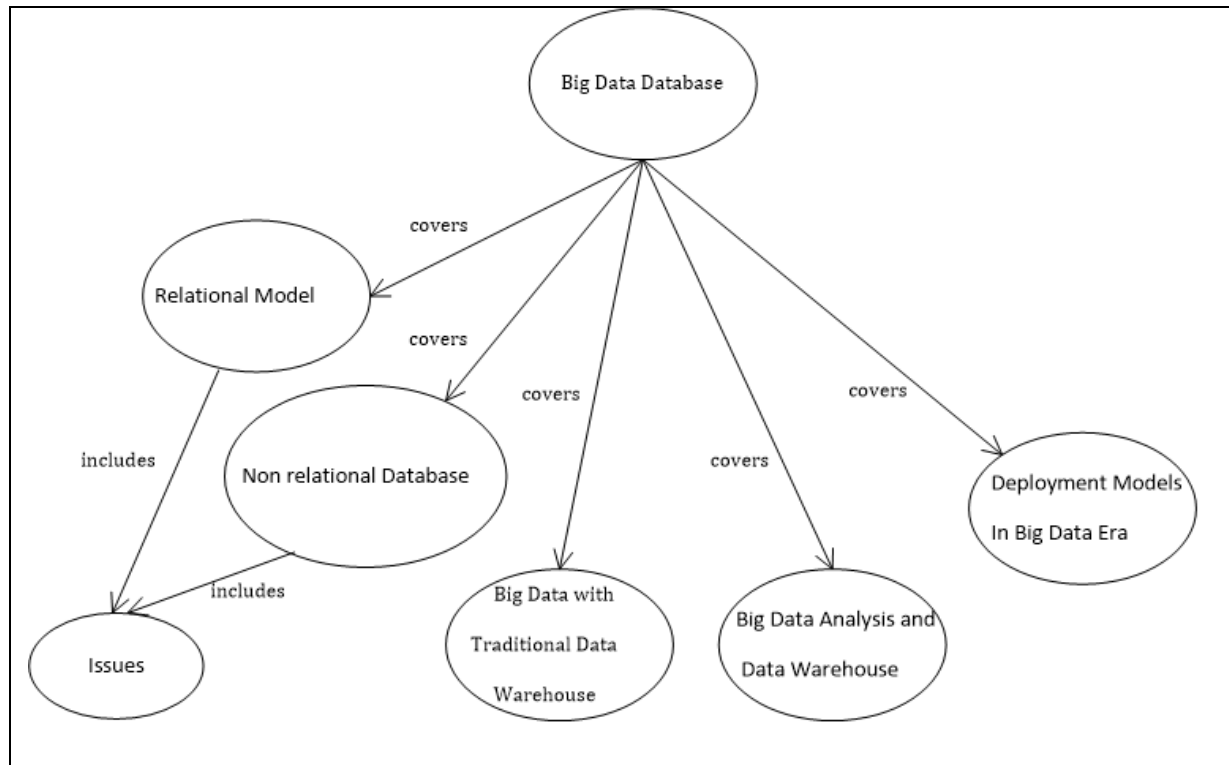| Learner	Activities to be done	PO mapped
For slow learners	Assign one questions after completion of every lecture as assignment.	PO1, PO2, PO5, PO7
For advanced learners	Give out of syllabus topics (i.e. Ping and Graph databases) to increase the knowledge.	PO1, PO2, PO4, PO5, PO6
For all	Demonstrate a sample programme in Hadoop.	PO1, PO5, PO6

Concept Map:

It is a hierarchical / tree based representation of all topics covered under the course. This gives direct / indirect relationship /association among topics as well as subtopics.
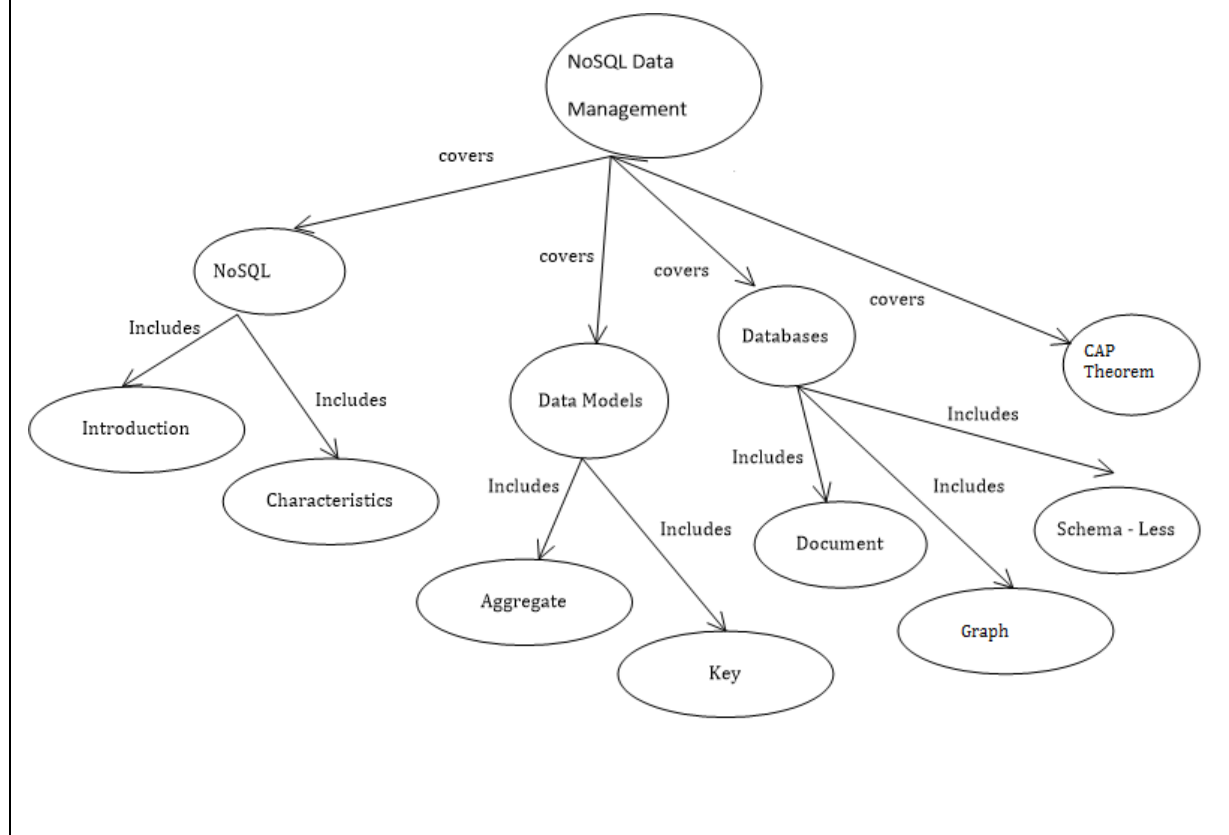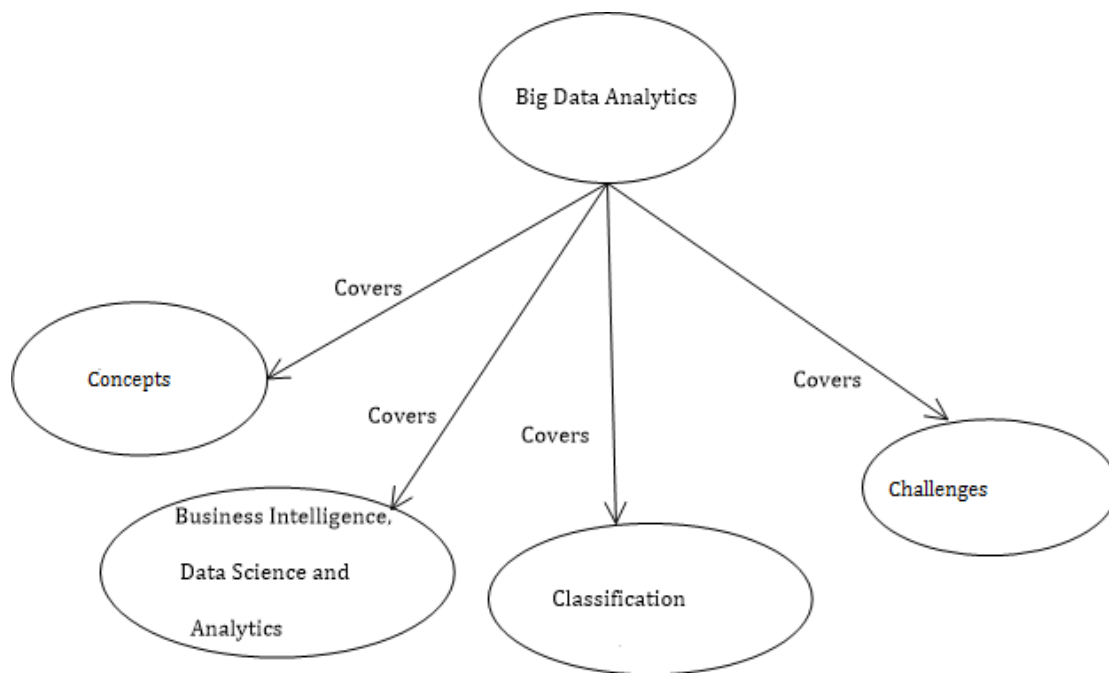
Unit-1:

Unit-2:

Big Data File System

covers

Overview

Includes

File System Architecture

Includes

Specific File System Types

Includes

File System Functions

includes

Operations

Unit-3:

Unit-4:

Unit-5:

Unit-6: