Course Code	
Course Name	NoSQL – MongoDB

Duration (in days)	3	Proficiency Level	Fundamental
Pre-requisites	RDBMS	Target Audience	Campus Hires

Learning Outcome

At the end of the program, participants will learn

- NoSQL Concepts and Background
- MongoDB: Installation Overview
- MongoDB: Write, Read, and Aggregate Data
- MongoDB: Indexes and Query Optimization
- MongoDB: Replication and Security

Day-wise Session Plan

Day	Unit	Objective(s)	Hours
1	NoSQL Concepts and Background	• Describe the basic structure of NoSQL • Identify some of the traits of NoSQL systems • Identify some of the key points of NoSQL systems • Recall the four most common categories of NoSQL systems • Recall some of the major milestones in the NoSQL development process • Recognize the importance of queries versus updates • Recognize characteristics that would make NoSQL a better choice than RDMS • Define BASE • Define CAP and Brewer's theorem • Define SPRAIN	2
1	Installing MongoDB	• What is MongoDB? • Describe the key features MongoDB provides • Describe data model design • Describe the installation options for MongoDB • Describe the packages and considerations for installing MongoDB on Linux • Installing MongoDB • Connect to a MongoDB database • Use the mongo shell	2
1 & 2	Write, Read, & Aggregate Data	• Describe CRUD • Describe how MongoDB stores data • Create and insert documents in MongoDB • Remove documents from a MongoDB database • Describe how read operations retrieve data • Describe how cursors are used • Use the find() method to query documents	10

		• Describe aggregation • Use aggregation pipeline to transform documents • Install MongoDB and read and aggregate data	
2 & 3	Indexes & Query Optimization	• Describe indexes • Describe the different types of indexes • Describe the index properties that can be set • Describe how query optimization works • Create single indexes • Create compound indexes	5
3	Replication & Security	• Describe how replication is used in MongoDB • Describe the replica set deployment architectures • Describe replica set high availability • Describe the read and write semantics for replica sets • Deploy a replica set • Describe how data synchronization is used to replicate data between members • Identify how security is implemented in a MongoDB database • Identify the authentication mechanisms • Enable authentication and create an administrator user that can connect to the deployment • Create users with read and write privileges	3
3	MongoDB with Python	• Install, set up, and connect to MongoDB using PyMongo • Make a database connection and get a database or collection • Insert, query, update, and delete data • Query by ObjectId and use find and find_one • Install and use the Python GridFS package • Create, delete, and manipulate fssiles in GridFS • Query data and find files in GridFS • Use streaming to upload and download files • Use Python to connect and interact with MongoDB	2