



Certified NoSQL Analyst (MongoDB) (CNA)

Course Outline

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Certified NoSQL Analyst (MongoDB)

DURATION

- 5 Days

COURSE OBJECTIVES

Modern day businesses accumulate an astonishing amount of digital data, which can be leveraged to unlock new sources of economic value or to provide fresh insights into business trends. Business Analytics is the emerging and fastest growing technology which every organization is embracing. Given the context of data growth both in structured and unstructured way, organization also need to move forward from SQL to NoSQL technology to store and handle the data before analyzing it. MongoDB is one of the new open source databases that focus on the ideas of the NoSQL (Not Only SQL) approach.

This specialized course focuses on MongoDB to implement different ways to store and handle data that can be modeled as a document format. This database is employed to handle documents in a free schema design that provides great flexibility to store and use data. This course covers the concept of big data, role of big data analytics in business, data/information architecture, data warehousing, business intelligence, NoSQL approach, data mining techniques and NoSQL & analytical tools and deals with the basic principles of MongoDB, key features, operations, data model and MongoDB architecture. Participants will be explored from installation and configuration of MongoDB to working on Mongo shell. Participants will learn data types in MongoDB, its schema design, create-read-update-delete operations, other MongoDB operators and index. In addition, participants will also learn about different data mining techniques through an open source analytical tool RapidMiner.

TARGET AUDIENCE

- Data Analyst - Statistics and Mining
- Big Data Analyst
- Database Administrator
- Data Scientist
- Operations Research Analyst
- IHL Students

PRE-REQUISITES

Participants are preferred to have some experience in software development with any RDBMS/SQL database environment.

PROGRAM STRUCTURE

This is a 5-day intensive training program with the following assessment components.

Component 1. Written Examination

Component 2. Project Work Component (PWC)

These components are individual based. Participants will need to obtain 70% in both the components in order to qualify for this certification. If the participant fails one of the components, they will not pass the course and have to re-take that particular failed component. If they fail both components, they will have to re-take the assessment.

COURSE OUTCOMES

- Understand business analytics with its impact on enterprises
- Understand the role of big data and NoSQL in business
- Learn NoSQL concepts and technique through an open source tool
- Acquire the knowledge and learn the design and operations of a NoSQL technology (MongoDB)
- Learn data mining concepts and techniques through an open source analytical tool

COURSE SESSION SCHEDULE

Day 1	Session 1 (9:00 – 10:30)	Session 2 (10:40 – 12:10)	Session 3 (13:10 – 16:10)	Session 4 (16:10 – 18:10)	
	Introduction to Business Analytics	Introduction to Business Analytics	Data/Information Architecture for Business Analytics	Introduction to Big Data	
Day 2	Session 1 (9:00 – 10:00)	Session 2 (10:10 – 12:10)	Session 3 (13:10 – 14:10)	Session 4 (14:10 – 17:10)	Session 5 (17:10 – 18:40)
	Introduction to Big Data	Introduction to NoSQL	Introduction to NoSQL	Introduction to MongoDB	Installation of MongoDB
Day 3	Session 1 (9:00 – 10:30)	Session 2 (10:40 – 12:40)	Session 3 (13:40 – 14:10)	Session 4 (14:10 – 16:10)	Session 5 (16:10 – 18:10)
	Installation of MongoDB	Mongo Shell	Mongo Shell	MongoDB Data Types	Schema Design
Day 4	Session 1 (9:00 – 10:30)	Session 2 (10:40 – 12:10)	Session 3 (13:10 – 16:10)	Session 4 (16:10 – 18:10)	
	CRUD Operations	CRUD Operations	MongoDB Operators	MongoDB Indexes	
Day 5	Session 1 (9:00 – 10:00)	Session 2 (10:10 – 12:10)	Session 3 (13:10 – 15:10)	Session 4 (15:10 – 17:40)	
	MongoDB Indexes	Data Mining Tool	Data Mining Techniques	CNA examination	

COURSE OUTLINE

Unit 1: Introduction to Business Analytics

- The concept of Business Analytics
- Data, Information, Knowledge and Wisdom
- Data as Unique Enterprise Asset
- Data, Information and Analytics Lifecycle
- Business Analytics – Current Context
- Types of Analytics
 - o Descriptive Analytics
 - o Predictive Analytics
 - o Prescriptive Analytics

Unit 2: Data/Information Architecture for Business Analytics

- Data/Information Architecture
- Concept of Data Warehouse/Enterprise Data Warehouse (EDW)
- ETL – Key Process
- Concept of Data Mart
- Business Intelligence
- Data Mining

Unit 3: Introduction to Big Data

- What is Big Data? Why Big Data?
- 3V's of Big Data
- The Rapid Growth of Unstructured Data
- Big Data Market Forecast
- Big Data Analytics
- Big Data in Business
- Big Data Types & Architecture

Unit 4: Introduction to NoSQL

- What is NoSQL
- Why is NoSQL
- Motives Behind NoSQL
- What is wrong with RDBMS?
- ACID Semantics
- CAP Semantics
- BASE
- Concurrency Models
- Data Models
 - o Key-Value Stores
 - o Tuples (rows)

- Document Stores
- Object Stores
- Column Stores
- Graph Stores

Unit 5: Introduction to MongoDB

- MongoDB Data Model
- Deployment Architectures
- MongoDB Design Philosophy
- Key MongoDB Features
- Operations
- Data Model
- Other NoSQL Types
- JSON & BSON
- MongoDB Architecture
- Uses

Unit 6: Installation of MongoDB

- Install MongoDB On Windows
- Install MongoDB On Ubuntu

Unit 7: Mongo Shell

- Starting the Mongo Shell
- Core Options in Mongo Shell
- Command Helpers
- Basic Shell JavaScript Operations
- Execute a JavaScript file

Unit 8: MongoDB Data Types

- Data Types
- Comparison/Sort Order
- BSON Data Types

Unit 9: Schema Design

- Dynamic Schema
- Schema Considerations
- Data Manipulation
- Data Access
- Document Structure
- References
- Embedded Data
- Atomicity of Write Operations

- Model Relationship between documents
- Model Specific Application Contexts
- Model Data to Support Keyword Search
- Limitations of Keyword Indexes
- Model Monetary Data
- Model Time Data

Unit 10: CRUD Operations

- Create Database
- Drop Database
- Create Collection
- Drop Collection
- Write Operation Overview
- Insert Behavior
- Update Document
- Read Operation Overview
- Query Interface
- Query Statement
- Remove Method
- Projections

Unit 11: MongoDB Operators

- Query and Projection Operators
- Update Operators
- Aggregation Pipeline Operators

Unit 12: MongoDB Indexes

- Creating Index
- Ensure Index
- Remove Index
- Index Information
- Index Types

Unit 13: Data Mining Tool

- Understand the open source DM tool RapidMiner
- Explore the various features of RapidMiner
- Walkthrough a RapidMiner demo with different scenarios

Unit 14: Data Mining Techniques

- Understand the various data mining techniques
- Understand how correlation matrix works

- Understand how association rule mining works
- Understanding the Predictive Analytics technique
- Understand the forecasting technique

WRITTEN ASSESSMENT

As part of the written examination, each participant will be assessed individually on the last day of the training for their understanding of the subject matter and ability to evaluate, choose and apply them in specific context and also the ability to identify and manage risks. The assessment focuses on higher levels of learning in Bloom's taxonomy: Application, Analysis, Synthesis and Evaluation.

This written examination will primarily consist of 40 multiple choice questions spanning various aspects as covered in the program. It is an individual, competency-based assessment.

EXAM PREPARATION

The objective of the certification examination is to evaluate the knowledge + skills acquired by the participants during the course on Big Data. The weightage in key topics of the course as follows:

- **Introduction to Business Analytics [5]**
- **Data/Information Architecture for Business Analytics [5]**
- **Introduction to Big Data [5]**
- **Introduction to NoSQL [5]**
- **Introduction to MongoDB [5]**
- **Mongo Shell [5]**
- **MongoDB Data Types [10]**
- **Schema Design [15]**
- **CRUD Operations [15]**
- **MongoDB Operators [10]**
- **MongoDB Indexes [10]**
- **Data Mining Tool & Techniques [10]**

TOOLS/SOFTWARE USED

- MongoDB Compass
- MongoDB
- RapidMiner