uCertify

Course Outline

Big Data: Concepts, Technology, and Architecture



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1. Course Objective

Get hands-on experience in Big Data tools, terminology, and technology with the Big Data: Concepts, Technology, and Architecture course and lab. The course provides a vivid introduction to the Big Data tools, terminology, and technology perfectly suited to a wide range of business professionals, academic researchers, and students with clear and approachable lesson flowcharts, and other tools. It illustrates how to look after challenges facing big data technology and technologists, like data heterogeneity and incompleteness, data volume and velocity, storage limitations, and privacy concerns.

2. Pre-Assessment

Pre-Assessment lets you identify the areas for improvement before you start your prep. It determines what students know about a topic before it is taught and identifies areas for improvement with question assessment before beginning the course.

3. Exercises

There is no limit to the number of times learners can attempt these. Exercises come with detailed remediation, which ensures that learners are confident on the topic before proceeding.



4. Quizzes

Quizzes test your knowledge on the topics of the exam when you go through the course material. There is no limit to the number of times you can attempt it.



5. flashcards

Flashcards are effective memory-aiding tools that help you learn complex topics easily. The flashcard will help you in memorizing definitions, terminologies, key concepts, and more. There is no limit to the number of times learners can attempt these. Flashcards help master the key concepts.



6. Glossary of terms

uCertify provides detailed explanations of concepts relevant to the course through Glossary. It contains a list of frequently used terminologies along with its detailed explanation. Glossary defines the key terms.



7. Expert Instructor-Led Training

uCertify uses the content from the finest publishers and only the IT industry's finest instructors. They have a minimum of 15 years real-world experience and are subject matter experts in their fields. Unlike a live class, you can study at your own pace. This creates a personal learning experience and gives you all the benefit of hands-on training with the flexibility of doing it around your schedule 24/7.

8. ADA Compliant & JAWS Compatible Platform

uCertify course and labs are ADA (Americans with Disability Act) compliant. It is now more accessible to students with features such as:

- Change the font, size, and color of the content of the course
- Text-to-speech, reads the text into spoken words
- Interactive videos, how-tos videos come with transcripts and voice-over
- Interactive transcripts, each word is clickable. Students can clip a specific part of the video by clicking on a word or a portion of the text.

JAWS (Job Access with Speech) is a computer screen reader program for Microsoft Windows that reads the screen either with a text-to-speech output or by a Refreshable Braille display. Student can easily navigate uCertify course using JAWS shortcut keys.

9. State of the Art Educator Tools

uCertify knows the importance of instructors and provide tools to help them do their job effectively. Instructors are able to clone and customize course. Do ability grouping. Create sections. Design grade scale and grade formula. Create and schedule assessments. Educators can also move a student from self-paced to mentor-guided to instructor-led mode in three clicks.

10. Award Winning Learning Platform (LMS)

uCertify has developed an award winning, highly interactive yet simple to use platform. The SIIA CODiE Awards is the only peer-reviewed program to showcase business and education technology's finest products and services. Since 1986, thousands of products, services and solutions have been

recognized for achieving excellence. uCertify has won CODiE awards consecutively for last 7 years:

- **2014**
    1. Best Postsecondary Learning Solution

- **2015**
    1. Best Education Solution
    2. Best Virtual Learning Solution
    3. Best Student Assessment Solution
    4. Best Postsecondary Learning Solution
    5. Best Career and Workforce Readiness Solution
    6. Best Instructional Solution in Other Curriculum Areas
    7. Best Corporate Learning/Workforce Development Solution

- **2016**
    1. Best Virtual Learning Solution
    2. Best Education Cloud-based Solution
    3. Best College and Career Readiness Solution
    4. Best Corporate / Workforce Learning Solution
    5. Best Postsecondary Learning Content Solution
    6. Best Postsecondary LMS or Learning Platform
    7. Best Learning Relationship Management Solution

- **2017**
    1. Best Overall Education Solution
    2. Best Student Assessment Solution
    3. Best Corporate/Workforce Learning Solution
    4. Best Higher Education LMS or Learning Platform

- **2018**
    1. Best Higher Education LMS or Learning Platform

2. Best Instructional Solution in Other Curriculum Areas
3. Best Learning Relationship Management Solution

- **2019**
  1. Best Virtual Learning Solution
  2. Best Content Authoring Development or Curation Solution
  3. Best Higher Education Learning Management Solution (LMS)

- **2020**
  1. Best College and Career Readiness Solution
  2. Best Cross-Curricular Solution
  3. Best Virtual Learning Solution

11. Chapter & Lessons

uCertify brings these textbooks to life. It is full of interactive activities that keeps the learner engaged. uCertify brings all available learning resources for a topic in one place so that the learner can efficiently learn without going to multiple places. Challenge questions are also embedded in the chapters so learners can attempt those while they are learning about that particular topic. This helps them grasp the concepts better because they can go over it again right away which improves learning.

Learners can do Flashcards, Exercises, Quizzes and Labs related to each chapter. At the end of every lesson, uCertify courses guide the learners on the path they should follow.

Syllabus

Chapter 1: Introduction to the World of Big Data

- Understanding Big Data
- Evolution of Big Data
- Failure of Traditional Database in Handling Big Data

- 3 Vs of Big Data
- Sources of Big Data
- Different Types of Data
- Big Data Infrastructure
- Big Data Life Cycle
- Big Data Technology
- Big Data Applications
- Big Data Use Cases

Chapter 2: Big Data Storage Concepts

- Cluster Computing
- Distribution Models
- Distributed File System
- Relational and Non?Relational Databases
- Scaling Up and Scaling Out Storage

Chapter 3: NoSQL Database

- Introduction to NoSQL

- Why NoSQL
- CAP Theorem
- ACID
- BASE
- Schemaless Databases
- NoSQL (Not Only SQL)
- Migrating from RDBMS to NoSQL

Chapter 4: Big Data Processing, Management, and Cloud Computing

- Part I: Big Data Processing and Management Conce...essing, Management Concepts, and Cloud Computing
- Data Processing
- Shared Everything Architecture
- Shared?Nothing Architecture
- Batch Processing
- Real?Time Data Processing
- Parallel Computing
- Distributed Computing
- Big Data Virtualization

- Part II: Managing and Processing Big Data in Clo...essing, Management Concepts, and Cloud Computing
- Introduction
- Cloud Computing Types
- Cloud Services
- Cloud Storage
- Cloud Architecture

Chapter 5: Driving Big Data with Hadoop Tools and Technologies

- Apache Hadoop
- Hadoop Storage
- Hadoop Computation
- Hadoop 2.0
- HBASE
- Apache Cassandra
- SQOOP
- Flume
- Apache Avro

- Apache Pig
- Apache Mahout
- Apache Oozie
- Apache Hive
- Hive Architecture
- Hadoop Distributions

Chapter 6: Big Data Analytics

- Terminology of Big Data Analytics
- Big Data Analytics
- Data Analytics Life Cycle
- Big Data Analytics Techniques
- Semantic Analysis
- Visual analysis
- Big Data Business Intelligence
- Big Data Real?Time Analytics Processing
- Enterprise Data Warehouse

Chapter 7: Big Data Analytics with Machine Learning

- Introduction to Machine Learning
- Machine Learning Use Cases
- Types of Machine Learning

Chapter 8: Mining Data Streams and Frequent Itemset

- Itemset Mining
- Association Rules
- Frequent Itemset Generation
- Itemset Mining Algorithms
- Maximal and Closed Frequent Itemset
- Mining Maximal Frequent Itemsets: the GenMax Algorithm
- Mining Closed Frequent Itemsets: the Charm Algorithm
- CHARM Algorithm Implementation
- Data Mining Methods
- Prediction
- Important Terms Used in Bayesian Network
- Density-Based Clustering Algorithm
- DBSCAN

- Kernel Density Estimation
- Mining Data Streams
- Time Series Forecasting

Chapter 9: Cluster Analysis

- Clustering
- Distance Measurement Techniques
- Hierarchical Clustering
- Analysis of Protein Patterns in the Human Cancer?Associated Liver
- Recognition Using Biometrics of Hands
- Expectation Maximization Clustering Algorithm
- Representative?Based Clustering
- Methods of Determining the Number of Clusters
- Optimization Algorithm
- Choosing the Number of Clusters
- Bayesian Analysis of Mixtures
- Fuzzy Clustering
- Fuzzy C?Means Clustering

Chapter 10: Big Data Visualization

- Big Data Visualization
- Conventional Data Visualization Techniques
- Tableau
- Bar Chart in Tableau
- Line Chart
- Pie Chart
- Bubble Chart
- Box Plot
- Tableau Use Cases
- Installing R and Getting Ready
- Data Structures in R
- Importing Data from a File
- Importing Data from a Delimited Text File
- Control Structures in R
- Basic Graphs in R

12. Practice Test

Here's what you get

75	75
PRE-ASSESSMENTS QUESTIONS	POST-ASSESSMENTS QUESTIONS

Features

Each question comes with detailed remediation explaining not only why an answer option is correct but also why it is incorrect.

Unlimited Practice

Each test can be taken unlimited number of times until the learner feels they are prepared. Learner can review the test and read detailed remediation. Detailed test history is also available.

Each test set comes with learn, test and review modes. In learn mode, learners will attempt a question and will get immediate feedback and complete remediation as they move on to the next question. In test mode, learners can take a timed test simulating the actual exam conditions. In review mode, learners can read through one item at a time without attempting it.

13. Live Labs

The benefits of live-labs are:

- Exam based practical tasks
- Real equipment, absolutely no simulations

- Access to the latest industry technologies
- Available anytime, anywhere on any device
- Break and Reset functionality
- No hardware costs

Lab Tasks

Introduction to the World of Big Data

- Discussing Big Data Characteristics
- Discussing Big Data

Big Data Storage Concepts

- Discussing Big Data Storage

NoSQL Database

- Discussing the NoSQL Database

Big Data Processing, Management, and Cloud Computing

- Implementing the Data Processing Cycle
- Discussing Big Data Processing and Management Concepts - Part I
- Discussing Big Data Processing and Management Concepts - Part II

Driving Big Data with Hadoop Tools and Technologies

- Discussing Components of Hadoop
- Discussing Big Data Using Hadoop Tools and Technologies

Big Data Analytics

- Discussing Big Data Analytics

Big Data Analytics with Machine Learning

- Discussing Machine Learning

Mining Data Streams and Frequent Itemset

- Implementing Frequent Itemset Mining Using R
- Determining the Support Count and Confidence Count
- Implementing the Eclat Algorithm Using R
- Implementing Apriori Algorithm Using R

Cluster Analysis

- Implementing K-Means Clustering

Big Data Visualization

- Creating a Connection in a New Workbook
- Creating a Bar Chart
- Creating a Line Chart
- Creating a Pie Chart
- Creating a Bubble Chart
- Creating a Box Plot
- Assigning Value to a Variable
- Using the length(), mean(), and median() Functions
- Using the matrix() Function
- Using the if-else Statement
- Using the for Loop
- Using the while Loop

Here's what you get

28	9	16
LIVE LABS	VIDEO TUTORIALS	MINUTES

14. Post-Assessment

After completion of the uCertify course Post-Assessments are given to students and often used in conjunction with a Pre-Assessment to measure their achievement and the effectiveness of the exam.

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