uCertify

Course Outline

Analytics, Data Science, & Artificial Intelligence: Systems for Decision Support

09 May 2024

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1. Course Objective

Know the various types of data analytics with examples, products, services, and exercises by means of introducing artificial intelligence, machine learning, robotics, chatbots, Internet of Things, and Web/Internet-related enablers with uCertify's course Analytics, Data Science, & Artificial Intelligence: Systems for Decision Support.

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: Preface

- What’s New in the Eleventh Edition?
- Plan of the Course
- Resources, Links, and the Teradata University Network Connection

Chapter 2: Overview of Business Intelligence, Analytics, Da...icial Intelligence: Systems for Decision Support

- Opening Vignette: How Intelligent Systems Work for KONE Elevators and Escalators Company
- Changing Business Environments and Evolving Needs for Decision Support and Analytics
- Decision-Making Processes and Computerized Decision Support Framework
- Evolution of Computerized Decision Support to Business Intelligence/Analytics/Data Science
- Analytics Overview
- Analytics Examples in Selected Domains
- Artificial Intelligence Overview
- Convergence of Analytics and AI
- Overview of the Analytics Ecosystem
- Lesson Highlights
- Questions for Discussion
- Exercises
- References

Chapter 3: Artificial Intelligence Concepts, Drivers, Major Technologies, and Business Applications

- Opening Vignette: INRIX Solves Transportation Problems
- Introduction to Artificial Intelligence
- Human and Computer Intelligence
- Major AI Technologies and Some Derivatives
- AI Support for Decision Making
- AI Applications in Accounting
- AI Applications in Financial Services
- AI in Human Resource Management (HRM)
- AI in Marketing, Advertising, and CRM
- AI Applications in Production-Operation Management (POM)
- Lesson Highlights
- Questions for Discussion
- Exercises
- References

Chapter 4: Nature of Data, Statistical Modeling, and Visualization

- Opening Vignette: SiriusXM Attracts and Engages ...on of Radio Consumers with Data-Driven Marketing

- Nature of Data
- Simple Taxonomy of Data
- Art and Science of Data Preprocessing
- Statistical Modeling for Business Analytics
- Regression Modeling for Inferential Statistics
- Business Reporting
- Data Visualization
- Different Types of Charts and Graphs
- Emergence of Visual Analytics
- Information Dashboards
- Lesson Highlights
- Questions for Discussion
- Exercises
- References

Chapter 5: Data Mining Process, Methods, and Algorithms

- Opening Vignette: Miami-Dade Police Department I... Predictive Analytics to Foresee and Fight Crime
- Data Mining Concepts

- Data Mining Applications
- Data Mining Process
- Data Mining Methods
- Data Mining Software Tools
- Data Mining Privacy Issues, Myths, and Blunders
- Lesson Highlights
- Questions for Discussion
- Exercises
- References

Chapter 6: Machine-Learning Techniques for Predictive Analytics

- Opening Vignette: Predictive Modeling Helps Better Understand and Manage Complex Medical Procedures
- Basic Concepts of Neural Networks
- Neural Network Architectures
- Support Vector Machines
- Process-Based Approach to the Use of SVM
- Nearest Neighbor Method for Prediction

- Naïve Bayes Method for Classification
- Bayesian Networks
- Ensemble Modeling
- Lesson Highlights
- Questions for Discussion
- Exercises
- References

Chapter 7: Deep Learning and Cognitive Computing

- Opening Vignette: Fighting Fraud with Deep Learning and Artificial Intelligence
- Introduction to Deep Learning
- Basics of “Shallow” Neural Networks
- Process of Developing Neural Network–Based Systems
- Illuminating the Black Box of ANN
- Deep Neural Networks
- Convolutional Neural Networks
- Recurrent Networks and Long Short-Term Memory Networks
- Computer Frameworks for Implementation of Deep Learning

- Cognitive Computing
- Lesson Highlights
- Questions for Discussion
- Exercises
- References

Chapter 8: Text Mining, Sentiment Analysis, and Social Analytics

- Opening Vignette: Amadori Group Converts Consumer Sentiments into Near-Real-Time Sales
- Text Analytics and Text Mining Overview
- Natural Language Processing (NLP)
- Text Mining Applications
- Text Mining Process
- Sentiment Analysis
- Web Mining Overview
- Search Engines
- Web Usage Mining (Web Analytics)
- Social Analytics
- Lesson Highlights

- Questions for Discussion
- Exercises
- References

Chapter 9: Prescriptive Analytics: Optimization and Simulation

- Opening Vignette: School District of Philadelphi...ptimal Solution for Awarding Bus Route Contracts
- Model-Based Decision Making
- Structure of Mathematical Models for Decision Support
- Certainty, Uncertainty, and Risk
- Decision Modeling with Spreadsheets
- Mathematical Programming Optimization
- Multiple Goals, Sensitivity Analysis, What-If Analysis, and Goal Seeking
- Decision Analysis with Decision Tables and Decision Trees
- Introduction to Simulation
- Visual Interactive Simulation
- Lesson Highlights
- Questions for Discussion

- Exercises
- References

Chapter 10: Big Data, Cloud Computing, and Location Analytics: Concepts and Tools

- Opening Vignette: Analyzing Customer Churn in a Telecom Company Using Big Data Methods
- Definition of Big Data
- Fundamentals of Big Data Analytics
- Big Data Technologies
- Big Data and Data Warehousing
- In-Memory Analytics and Apache SparkTM
- Big Data and Stream Analytics
- Big Data Vendors and Platforms
- Cloud Computing and Business Analytics
- Location-Based Analytics for Organizations
- Lesson Highlights
- Questions for Discussion
- Exercises
- References

Chapter 11: Robotics: Industrial and Consumer Applications

- Opening Vignette: Robots Provide Emotional Support to Patients and Children
- Overview of Robotics
- History of Robotics
- Illustrative Applications of Robotics
- Components of Robots
- Various Categories of Robots
- Autonomous Cars: Robots in Motion
- Impact of Robots on Current and Future Jobs
- Legal implications of Robots and Artificial Intelligence
- Lesson Highlights
- Questions for Discussion
- Exercises
- References

Chapter 12: Group Decision Making, Collaborative Systems, and AI Support

- Opening Vignette: Hendrick Motorsports Excels with Collaborative Teams

- Making Decisions in Groups: Characteristics, Process, Benefits, and Dysfunctions
- Supporting Group Work and Team Collaboration with Computerized Systems
- Electronic Support for Group Communication and Collaboration
- Direct Computerized Support for Group Decision Making
- Collective Intelligence and Collaborative Intelligence
- Crowdsourcing as a Method for Decision Support
- Artificial Intelligence and Swarm AI Support of Team Collaboration and Group Decision Making
- Human–Machine Collaboration and Teams of Robots
- Lesson Highlights
- Questions for Discussion
- Exercises
- References

Chapter 13: Knowledge Systems: Expert Systems, Recommenders,..., Virtual Personal Assistants, and Robo Advisors

- Opening Vignette: Sephora Excels with Chatbots
- Expert Systems and Recommenders
- Concepts, Drivers, and Benefits of Chatbots

- Enterprise Chatbots
- Virtual Personal Assistants
- Chatbots as Professional Advisors (Robo Advisors)
- Implementation Issues
- Lesson Highlights
- Questions for Discussion
- Exercises
- References

Chapter 14: The Internet of Things as a Platform for Intelligent Applications

- Opening Vignette: CNH Industrial Uses the Internet of Things to Excel
- Essentials of IoT
- Major Benefits and Drivers of IoT
- How IoT Works
- Sensors and Their Role in IoT
- Selected IoT Applications
- Smart Homes and Appliances
- Smart Cities and Factories

- Autonomous (Self-Driving) Vehicles
- Implementing IoT and Managerial Considerations
- Lesson Highlights
- Questions for Discussion
- Exercises
- References

Chapter 15: Implementation Issues: From Ethics and Privacy to Organizational and Societal Impacts

- Opening Vignette: Why Did Uber Pay $245 Million to Waymo?
- Implementing Intelligent Systems: An Overview
- Legal, Privacy, and Ethical Issues
- Successful Deployment of Intelligent Systems
- Impacts of Intelligent Systems on Organizations
- Impacts on Jobs and Work
- Potential Dangers of Robots, AI, and Analytical Modeling
- Relevant Technology Trends
- Future of Intelligent Systems
- Lesson Highlights

- Questions for Discussion
- Exercises
- References

12. Practice Test

Here's what you get

140	140
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. Performance Based Labs

uCertify's performance-based labs are simulators that provides virtual environment. Labs deliver hands on experience with minimal risk and thus replace expensive physical labs. uCertify Labs are cloud-based, device-enabled and can be easily integrated with an LMS. Features of uCertify labs:

- Provide hands-on experience in a safe, online environment
- Labs simulate real world, hardware, software & CLI environment
- Flexible and inexpensive alternative to physical Labs
- Comes with well-organized component library for every task
- Highly interactive - learn by doing
- Explanations and remediation available
- Videos on how to perform

Lab Tasks

- Identifying Types of Decision
- Identifying Phases Involved in Decision Making
- Understanding Business Intelligence
- Identifying Enablers that belong to the Type of Business Analytics
- Understanding Artificial Intelligence
- Understanding AI Technologies
- Identifying Steps Involved in Data Preprocessing
- Understanding the Different Charts and Graphs
- Learning Data Mining Patterns
- Identifying Tasks Involved in Data Mining Methods
- Learning Data Mining Algorithms, Processes, and Methods
- Understanding Predictive Modeling
- Identifying Activities Involved in an SVM Model
- Understanding AI and its Advancements
- Identifying Technologies Involved in Cognitive Computing and AI
- Understanding Text Mining

- Understanding Natural Language Processing
- Understanding Simulation
- Understanding Visual Interaction Simulation
- Understanding big data
- Understanding big data and Cloud Computing
- Understanding Robotics and AI
- Understanding the Applications of Robotics
- Identifying the Software Tools
- Understanding Group Decision Making
- Understanding Chatbot
- Understanding Sensor
- Understanding Smart Home
- Understanding the Implementation of Intelligent System

Here's what you get

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PERFORMANCE BASED LAB

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.

GET IN TOUCH: