

# Certified Analytics Professional

## Course outline

### **Module 1: Introduction to Analytics**

Module 1: Introduction to Analytics is an introductory course designed to provide an overview of the fundamentals of analytics. It covers topics such as data collection, data analysis, data visualization, and predictive analytics. It also provides an introduction to the tools and techniques used in analytics, as well as an overview of the different types of analytics. This module is essential for those looking to become a Certified Analytics Professional.

#### ***Lessons***

- Introduction to Data Science and Analytics
- Overview of Data Analysis Techniques
- Exploratory Data Analysis
- Descriptive Statistics
- Data Visualization
- Predictive Modeling
- Machine Learning Algorithms
- Data Mining
- Text Mining
- Big Data Analytics

#### **After completing this module, students will be able to:**

- Understand the fundamentals of analytics and its application in business.
- Develop an understanding of the different types of analytics and their uses.
- Learn how to use analytics to identify trends and patterns in data.
- Develop the ability to interpret and communicate the results of analytics to stakeholders.

### **Module 2: Data Collection and Preparation**

Module 2 of the Certified Analytics Professional course focuses on data collection and preparation. It covers topics such as data sources, data collection methods, data cleaning, data transformation, data integration, and data visualization. Students will learn how to identify and acquire data, clean and transform it, and prepare it for analysis. They will also learn how to use data visualization techniques to explore and interpret data.

#### ***Lessons***

- Data Acquisition Strategies
- Data Cleaning and Pre-processing
- Data Transformation and Feature Engineering
- Data Visualization and Exploration
- Data Quality Assurance
- Data Sampling and Sampling Techniques
- Data Integration and Consolidation
- Data Warehousing and Data Marts
- Data Mining and Machine Learning
- Big Data Analytics and Cloud Computing

### **After completing this module, students will be able to:**

- Understand the fundamentals of data collection and preparation techniques.
- Develop the ability to identify and select appropriate data sources for a given analytics project.
- Utilize data wrangling techniques to clean, transform, and prepare data for analysis.
- Develop the ability to identify and address data quality issues.

## **Module 3: Exploratory Data Analysis**

Module 3 of the Certified Analytics Professional course focuses on Exploratory Data Analysis (EDA). This module covers the fundamentals of EDA, including data visualization, descriptive statistics, and data wrangling. Students will learn how to use various tools and techniques to explore and analyze data, as well as how to identify patterns and trends in data. Additionally, students will gain an understanding of the importance of data exploration and how it can be used to inform decision-making.

### ***Lessons***

- Introduction to Exploratory Data Analysis
- Data Visualization Techniques
- Descriptive Statistics
- Inferential Statistics
- Data Mining Techniques
- Data Cleaning and Preparation
- Feature Selection and Engineering
- Model Building and Evaluation
- Time Series Analysis
- Text Mining and Natural Language Processing

### **After completing this module, students will be able to:**

- Understand the importance of exploratory data analysis and its role in the data science process.
- Utilize various graphical and numerical techniques to explore and summarize data.
- Identify patterns, trends, and relationships in data.
- Develop an understanding of the assumptions and limitations of exploratory data analysis.

## Module 4: Statistical Modeling

Module 4 of the Certified Analytics Professional course focuses on statistical modeling. It covers topics such as linear and logistic regression, decision trees, and clustering. Students will learn how to use these techniques to analyze data and make predictions. They will also learn how to interpret the results of their models and use them to make decisions.

### ***Lessons***

- Introduction to Statistical Modeling
- Linear Regression Modeling
- Logistic Regression Modeling
- Time Series Modeling
- Survival Analysis
- Decision Trees and Random Forests
- Model Validation and Selection
- Model Interpretation and Communication
- Advanced Modeling Techniques
- Model Deployment and Maintenance

### **After completing this module, students will be able to:**

- Understand the fundamentals of statistical modeling and its application in data analysis.
- Develop an understanding of the different types of statistical models and their uses.
- Utilize various statistical techniques to analyze data and draw meaningful insights.
- Interpret the results of statistical models and communicate them effectively to stakeholders.

## Module 5: Machine Learning

Module 5 of the Certified Analytics Professional course focuses on Machine Learning, a powerful tool for predictive analytics. It covers topics such as supervised and unsupervised learning, decision trees, support vector machines, and neural networks. Students will learn how to apply these techniques to real-world problems and gain an understanding of the underlying principles of machine learning.

### ***Lessons***

- Introduction to Machine Learning
- Supervised Learning Algorithms
- Unsupervised Learning Algorithms
- Model Evaluation and Selection
- Feature Engineering
- Neural Networks
- Deep Learning
- Natural Language Processing
- Reinforcement Learning
- Time Series Analysis
- Recommender Systems

- Anomaly Detection
- Text Mining
- Image Recognition
- Big Data and Machine Learning

### **After completing this module, students will be able to:**

- Understand the fundamentals of machine learning algorithms and their applications.
- Develop proficiency in using machine learning algorithms to solve real-world problems.
- Utilize machine learning techniques to build predictive models and interpret their results.
- Implement machine learning algorithms in Python and other programming languages.

## **Module 6: Data Visualization**

Module 6 of the Certified Analytics Professional course focuses on data visualization, which is the process of creating visual representations of data to help identify patterns, trends, and correlations. This module covers topics such as data visualization principles, data visualization tools, and best practices for creating effective visualizations. Students will learn how to create compelling visualizations that can be used to communicate data-driven insights to stakeholders.

### ***Lessons***

- Introduction to Data Visualization
- Exploring Data Visualization Tools
- Data Visualization Best Practices
- Designing Effective Visualizations
- Creating Interactive Visualizations
- Advanced Data Visualization Techniques
- Data Visualization for Business Intelligence
- Data Visualization for Machine Learning
- Data Visualization for Big Data
- Data Visualization for Dashboards and Reports

### **After completing this module, students will be able to:**

- Understand the fundamentals of data visualization and its importance in data analysis.
- Develop the ability to create effective visualizations to communicate insights from data.
- Utilize various data visualization tools and techniques to create meaningful visualizations.
- Interpret and analyze data visualizations to draw meaningful conclusions.

## **Module 7: Business Intelligence**

Module 7 of the Certified Analytics Professional course focuses on Business Intelligence. It covers topics such as data warehousing, data mining, and analytics. Students will learn how to use various tools and techniques to analyze data and make informed decisions. They will also gain an understanding of the different types of business intelligence and how to apply them in various business scenarios.

## ***Lessons***

- Introduction to Business Intelligence
- Data Warehousing and Data Marts
- Data Visualization and Dashboards
- Data Mining and Predictive Analytics
- Business Intelligence Tools and Technologies
- Data Governance and Security
- Big Data Analytics
- Text Mining and Natural Language Processing
- Machine Learning and Artificial Intelligence
- Business Intelligence Reporting and Analytics

### **After completing this module, students will be able to:**

- Understand the fundamentals of Business Intelligence and its components
- Develop an understanding of the various data sources and data warehouses used in Business Intelligence
- Utilize data mining techniques to uncover insights from data
- Design and implement a Business Intelligence solution to support decision making

## **Module 8: Predictive Modeling**

Module 8 of the Certified Analytics Professional course covers predictive modeling, which is the process of using data to make predictions about future outcomes. This module will teach students how to use predictive models to identify patterns in data, build models to make predictions, and evaluate the accuracy of their predictions. Students will also learn how to use predictive models to make decisions and optimize business processes.

## ***Lessons***

- Introduction to Predictive Modeling
- Exploratory Data Analysis for Predictive Modeling
- Feature Selection and Engineering
- Model Selection and Evaluation
- Model Tuning and Optimization
- Model Deployment and Maintenance
- Advanced Predictive Modeling Techniques
- Time Series Forecasting
- Text Mining and Natural Language Processing
- Ensemble Modeling
- Deep Learning for Predictive Modeling
- Predictive Modeling in Big Data Environment

### **After completing this module, students will be able to:**

- Understand the fundamentals of predictive modeling and its applications in the field of analytics.
- Develop and evaluate predictive models using various techniques such as linear regression, logistic regression, decision trees, and ensemble methods.
- Utilize various tools and techniques to optimize and improve the performance of predictive models.
- Interpret and communicate the results of predictive models to stakeholders.

## **Module 9: Optimization**

Module 9 of the Certified Analytics Professional course focuses on optimization techniques and strategies. It covers topics such as linear programming, nonlinear programming, integer programming, dynamic programming, and heuristics. Students will learn how to use optimization techniques to solve complex problems and develop efficient solutions.

### ***Lessons***

- Introduction to Optimization
- Linear Programming
- Integer Programming
- Nonlinear Programming
- Network Flow Optimization
- Dynamic Programming
- Multi-Objective Optimization
- Heuristic Optimization
- Metaheuristic Optimization
- Constraint Programming
- Stochastic Optimization
- Simulation Optimization
- Evolutionary Algorithms
- Swarm Intelligence
- Optimization Software Tools
- Optimization Modeling and Applications

### **After completing this module, students will be able to:**

- Understand the concept of optimization and its application in analytics.
- Develop an understanding of the various optimization techniques and algorithms.
- Implement optimization techniques to solve real-world problems.
- Analyze the results of optimization models and make informed decisions.

## **Module 10: Text Mining**

Module 10: Text Mining for Certified Analytics Professional course provides an introduction to the fundamentals of text mining and natural language processing. It covers topics such as text pre-processing, text analysis, text clustering, and text classification. It also covers the use of text mining tools and techniques to extract meaningful insights from unstructured text data.

### ***Lessons***

- Introduction to Text Mining
- Text Pre-processing
- Text Representation
- Text Classification
- Text Clustering
- Text Summarization
- Text Visualization
- Text Mining Applications
- Text Mining Tools
- Text Mining Challenges and Best Practices

### **After completing this module, students will be able to:**

- Understand the fundamentals of text mining and its applications in the field of analytics.
- Develop the ability to apply text mining techniques to extract meaningful insights from unstructured data.
- Utilize text mining tools and techniques to analyze large volumes of text data.
- Develop the ability to interpret and visualize the results of text mining analysis.

## **Module 11: Big Data Analytics**

Module 11 of the Certified Analytics Professional course focuses on Big Data Analytics. It covers topics such as data mining, machine learning, and predictive analytics, as well as the tools and techniques used to analyze large datasets. Students will learn how to use big data to identify patterns, trends, and correlations, and how to use these insights to make informed decisions. The module also covers the ethical considerations of big data analytics.

### ***Lessons***

- Introduction to Big Data Analytics
- Data Collection and Pre-processing
- Exploratory Data Analysis
- Data Visualization
- Predictive Modeling
- Machine Learning Algorithms
- Text Mining and Natural Language Processing
- Time Series Analysis
- Recommender Systems
- Social Network Analysis
- Big Data Storage and Processing
- Big Data Security and Privacy
- Big Data Governance
- Big Data Applications in Business and Industry

### **After completing this module, students will be able to:**

- Understand the fundamentals of big data analytics and its applications in various industries.

- Develop an understanding of the various tools and techniques used in big data analytics.
- Develop the ability to analyze large datasets and draw meaningful insights from them.
- Develop the ability to design and implement big data analytics projects.

## **Module 12: Data Mining**

Module 12 of the Certified Analytics Professional course covers the fundamentals of data mining, including data pre-processing, data exploration, data visualization, and predictive modeling. It provides an overview of the various techniques used in data mining, such as decision trees, neural networks, and clustering. It also covers the use of data mining tools and techniques to uncover patterns and trends in data. Finally, it provides an introduction to the ethical considerations of data mining.

### ***Lessons***

- Introduction to Data Mining
- Data Pre-processing
- Exploratory Data Analysis
- Data Visualization
- Association Rule Mining
- Classification and Prediction
- Clustering
- Text Mining
- Time Series Analysis
- Recommender Systems
- Anomaly Detection
- Evaluation of Data Mining Models
- Big Data Analytics
- Data Mining Tools and Techniques
- Data Mining Applications

### **After completing this module, students will be able to:**

- Understand the fundamentals of data mining and its applications in the field of analytics.
- Develop an understanding of the various data mining techniques and algorithms.
- Learn to apply data mining techniques to solve real-world problems.
- Develop the ability to interpret and visualize data mining results.

## **Module 13: Data Warehousing**

Module 13 of the Certified Analytics Professional course covers the fundamentals of data warehousing. It provides an overview of the different types of data warehouses, their components, and the processes involved in designing and implementing a data warehouse. It also covers topics such as data modeling, ETL, data quality, and data governance.

### ***Lessons***

- Introduction to Data Warehousing



- Data Warehouse Architecture
- Data Modeling for Data Warehousing
- Data Extraction, Transformation and Loading
- Data Warehouse Performance Tuning
- Data Warehouse Security
- Data Warehouse Automation
- Data Warehouse Testing
- Data Warehouse Maintenance
- Data Warehouse Reporting and Analytics

### **After completing this module, students will be able to:**

- Understand the fundamentals of data warehousing and its components
- Design and implement a data warehouse architecture
- Utilize ETL tools to extract, transform, and load data into a data warehouse
- Analyze data from a data warehouse to generate insights and reports

## **Module 14: Data Governance**

Module 14 of the Certified Analytics Professional course focuses on data governance. It covers topics such as data governance principles, data governance frameworks, data governance roles and responsibilities, data quality management, and data security. It also provides an overview of the tools and techniques used to ensure data governance compliance.

### ***Lessons***

- Understanding Data Governance Principles
- Establishing Data Governance Policies
- Implementing Data Governance Processes
- Managing Data Quality
- Developing Data Governance Metrics
- Leveraging Data Governance Tools
- Creating a Data Governance Framework
- Integrating Data Governance with Business Processes
- Ensuring Data Security and Privacy
- Establishing Data Governance Best Practices

### **After completing this module, students will be able to:**

- Understand the importance of data governance and its role in the analytics process.
- Develop a data governance framework to ensure data accuracy and integrity.
- Implement data governance policies and procedures to ensure data quality and security.
- Monitor and audit data governance processes to ensure compliance with regulations and standards.

## **Module 15: Data Security**

Module 15 of the Certified Analytics Professional course focuses on data security. It covers topics such as data encryption, authentication, access control, and data integrity. It also provides an overview of the different types of security threats and how to protect against them. The module also provides an introduction to the various security standards and best practices for data security.

## ***Lessons***

- Introduction to Data Security
- Data Security Policies and Procedures
- Data Encryption and Decryption
- Access Control and Authentication
- Data Loss Prevention
- Data Security Auditing
- Network Security
- Database Security
- Cloud Security
- Mobile Security
- Application Security
- Identity and Access Management
- Risk Management
- Disaster Recovery and Business Continuity
- Legal and Regulatory Compliance

## **After completing this module, students will be able to:**

- Understand the importance of data security and the various security measures that can be implemented to protect data.
- Implement data security measures such as encryption, authentication, and access control.
- Identify and mitigate potential security threats to data.
- Develop strategies to ensure the security of data in the analytics environment.

## **Module 16: Project Management**

Module 16 of the Certified Analytics Professional course provides an introduction to project management principles and techniques. It covers topics such as project planning, scheduling, budgeting, risk management, and communication. It also provides an overview of the tools and techniques used to manage projects, as well as best practices for successful project delivery.

## ***Lessons***

- Introduction to Project Management
- Project Planning and Scheduling
- Risk Management
- Project Cost Estimation
- Quality Assurance and Control
- Project Communication and Documentation
- Project Leadership and Team Building

- Project Monitoring and Evaluation
- Project Closure and Post-Project Review
- Agile Project Management

### **After completing this module, students will be able to:**

- Develop a comprehensive project plan that outlines the scope, timeline, budget, and resources needed to complete a project.
- Utilize project management tools and techniques to effectively manage project risks and ensure successful project completion.
- Monitor and control project progress to ensure that the project is completed on time and within budget.
- Identify and resolve project issues and conflicts in a timely manner.

## **Module 17: Ethics and Professionalism in Analytics**

Module 17 of the Certified Analytics Professional course focuses on the ethical and professional considerations of analytics. It covers topics such as data privacy, data security, and the ethical implications of analytics. It also covers the importance of professional conduct and communication when working with data. The module provides an overview of the ethical and professional considerations of analytics and provides guidance on how to apply these principles in practice.

### ***Lessons***

- Understanding the Role of Ethics in Analytics
- Developing an Ethical Framework for Analytics
- Analyzing the Impact of Data Privacy and Security
- Exploring the Role of Professionalism in Analytics
- Understanding the Impact of Bias in Analytics
- Analyzing the Impact of Unethical Practices in Analytics
- Developing Strategies for Ethical Decision Making
- Exploring the Role of Analytics in Social Responsibility
- Understanding the Role of Analytics in Corporate Governance
- Analyzing the Impact of Analytics on Regulatory Compliance

### **After completing this module, students will be able to:**

- Understand the ethical implications of data analytics and the importance of professional conduct in the field.
- Develop an understanding of the legal and ethical considerations when working with data.
- Develop an understanding of the ethical implications of data analytics and the importance of professional conduct in the field.
- Develop the ability to identify and address ethical issues in data analytics projects.