CIS C270: PREDICTIVE ANALYTICS

Item	Value
Curriculum Committee Approval Date	10/27/2023
Top Code	070200 - Computer Information Systems
Units	3 Total Units
Hours	72 Total Hours (Lecture Hours 54; Lab Hours 18)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	No
Basic Skills	Not Basic Skills (N)
Repeatable	No
Grading Policy	Standard Letter (S), • Pass/No Pass (B)

Course Description

In this course students will gain an understanding of the art and science of predictive analytics as it relates to improving business and organizational performance. Students will understand data elements from a business perspective through the exploration of key concepts within the data analytics lifecycle. These concepts include defining the objective, conducting exploratory data analysis, and transforming data formats to produce a dataset suitable for analytical modeling. After successful completion of the course, students will be able to use these skills to produce fully processed datasets that are compatible for building predictive models that can be deployed to increase organizational effectiveness. ADVISORY: CIS C250. Transfer Credit: CSU.

Course Level Student Learning Outcome(s)

1. Identify appropriate predictive analytic methods, principles, and techniques for a given scenario.
2. Demonstrate data transformation techniques to reshape, clean, and manipulate data for predictive modeling.
3. Apply predictive analytic techniques to discover patterns, relationships, associativity, and forecasted trends in datasets.

Course Objectives

- 1. Define predictive analytics and its significance in data-driven decision-making.
- 2. Explain methods, principles, and techniques for conducting predictive analytics projects from start to finish.
- 3. Demonstrate how to conduct Exploratory Data Analysis (EDA) to gain insights into data distributions, correlations, and patterns.
- 4. Demonstrate the application of predictive analytics techniques to effectively analyze and interpret diverse datasets.
- 5. Describe different predictive modeling techniques and algorithms (e.g., regression, classification, time series forecasting)
- 6. Describe how to build and tune predictive models using software tools or programming languages.
- 7. Explain the concepts and principles of time series data and forecasting methods.
- 8. Discuss ethical considerations in predictive analytics, including bias and fairness.
- 9. Explain how to create reports and visualizations to convey the results of predictive analyses.
- 10. Discuss the need for lifelong learning to adapt to changing data and business needs.

Lecture Content

Predictive Analytics and the Data Analytics Lifecycle Linear Programming and Optimization Data Preparation and Preprocessing Sensitivity Analysis and Network Modeling Model Building and Tuning Exploratory Data Analysis Regression Analysis Data Mining Time Series Forecasting Ethical Considerations and Addressing Bias Decision Analysis Use Cases and Applications The Evolving Nature of Predictive Analytics

Lab Content

Hands-on projects using Tableau to solve business problems and provide an appropriate solution. Hands-on projects using Microsoft BI to solve business problems and provide an appropriate solution. Hands-on projects using practical applications for data preparation, data modeling, and time series analysis to solve organizational problems and provide an appropriate solution.

Method(s) of Instruction

- Lecture (02)
- DE Live Online Lecture (02S)
- DE Online Lecture (02X)
- Lab (04)
- DE Live Online Lab (04S)
- DE Online Lab (04X)

Instructional Techniques

This course will utilize a combination of lecture, hands-on guided laboratory assignments, classroom/discussion student interactions, quizzes, tests, and problem-solving and troubleshooting assignments to achieve the goals and objectives of this course. All instructional methods are consistent across all modalities.

Reading Assignments

Read textbook about the significance of using predictive analytics to solve business problems. Read case studies about using predictive analytics tools to solve business problems.

Writing Assignments

Research topics related to predictive analytics and the data analytics lifecycle Written assignments related to predictive analytics and data analytics tools Presentations related to predictive analytics and data analytics tools

Out-of-class Assignments

Quizzes Hands-on projects using data analytics tools Research topics related to predictive analytics Discussion forums related to predictive analytics topics

Demonstration of Critical Thinking

Students will develop data dashboards based on business scenarios using well-known data analytics applications discussed in class.

Required Writing, Problem Solving, Skills Demonstration

Skills will be demonstrated through hands-on assignments and presentations throughout the course. Presentations include PowerPoint slides and visual demonstrations of the materials that students have created.

Eligible Disciplines

Computer information systems (computer network installation, microcomputer ...: Any bachelors degree and two years of professional experience, or any associate degree and six years of professional experience. Computer service technology: Any bachelors degree and two years of professional experience, or any associate degree and six years of professional experience.

Textbooks Resources

1. Required Ragsdale, Cliff. Spreadsheet Modeling Decision Analysis: A Practical Introduction to Business Analytics, 9th ed. ISBN-10: 0357711025, ISBN-13: 9780357711026: Cengage, 2022

Other Resources

1. Coastline Library 2. OER - Open Educational Resources