



El Camino College
COURSE OUTLINE OF RECORD – Official

Subject:	CIS
Course Number:	171
Descriptive Title:	Introduction to Data Analytics
Division:	Business
Department:	Computer Information Systems
Course Disciplines:	Computer Information Systems
Catalog Description:	This course is an introduction to the fundamental concepts of data analytics. Students learn how to use tools for acquiring, cleaning, and analyzing data; make data-driven decisions to enhance business results; and effectively communicate results.
Prerequisite:	
Co-requisite:	
Recommended Preparation:	CIS 13 with a minimum grade of C or equivalent experience
Enrollment Limitation:	
Hours Lecture (per week):	2
Hours Laboratory (per week):	3
Outside Study Hours:	4
Total Course Hours:	90
Course Units:	3
Grading Method:	Letter Grade only
Credit Status:	Credit, degree applicable
Transfer CSU:	Yes
Effective Date:	propose
Transfer UC:	Yes
Effective Date:	propose
General Education ECC:	
Term:	
Other:	
CSU GE:	
Term:	
Other:	
IGETC:	
Term:	
Other:	
Student Learning Outcomes:	

	1. Data Analytics Concepts: Demonstrate an understanding of the theory and practice of data analytics. 2. Data Preparation: Apply the methods and tools to access, collect, and integrate data and metadata for use in analytics. 3. Data Analytics Problem-Solving and Decision-Making Analyze data for business decision-making and present results.
Course Objectives:	1. Describe data analytics and its applicability to business decision-making. 2. Compare and contrast the major types of analytics. 3. Apply basic data analytics methods to business decision-making. 4. Describe and perform data collection, manipulation, and preparation using standard data analytics software. 5. Describe standard data analytics techniques used to identify insights. 6. Present analysis insights based on standard data analytic practices.
Major Topics:	I. Introduction to Data Analytics (Lecture, 3 hours) A. Definition of data analytics B. Uses of data and data analytics in business C. The major types of data analytics D. Survey of popular data analytics tools II. The Data Pipeline (Lecture, 2 hours) A. Definition B. Designing a data pipeline III. Data Analytics Tools Fundamentals (Lecture, 6 hours) A. Programming environment B. Programming language basics C. Data structures and file formats D. Standard libraries for analytics IV. Data Preparation (Lecture, 9 hours) A. Integrating an external data source B. Transforming data C. Combining and reshaping data D. Handling missing and duplicate data E. Handling categorical data V. Exploratory Data Analysis (Lecture, 5 hours) A. Grouping and binning data B. Detecting outliers C. Descriptive statistics and aggregates

VI. Introduction to Modeling (Lecture, 6 hours)

- A. Basic models for estimation and classification
- B. Grouping data
- C. Time series

VII. Communicating Results (Lecture, 5 hours)

- A. Organizing results
- B. Reporting tabular data
- C. Basic data visualization and plotting

VIII. The Data Pipeline (Lab, 4 hours)

- A. Data pipeline tools
- B. Creating a pipeline

IX. Data Analytics Tools Fundamentals (Lab, 10 hours)

- A. Programming environment
- B. Programming language basics
- C. Data structures and file formats
- D. Standard libraries for analytics

X. Data Preparation (Lab, 10 hours)

- A. Integrating an external data source
- B. Transforming data
- C. Combining and reshaping data
- D. Handling missing and duplicate data
- E. Handling categorical data

XI. Exploratory Data Analysis (Lab, 10 hours)

- A. Grouping and binning data
- B. Detecting outliers
- C. Descriptive statistics and aggregates

XII. Introduction to Modeling (Lab, 10 hours)

- A. Basic models for estimation and classification
- B. Grouping data
- C. Time series

XIII. Communicating Results (Lab, 10 hours)

- A. Organizing results
- B. Reporting tabular data
- C. Basic data visualization and plotting

Total Lecture Hours:	36
Total Laboratory Hours:	54
Total Hours:	90
Primary Method of Evaluation:	2) Problem solving demonstrations (computational or non-computational)
Typical Assignment Using Primary Method of Evaluation:	Load data from the specified data sources into a data frame. Prepare the data for analysis, including at a minimum: handling null values and duplicate values; checking for and handling outliers; and handling categorical values. Provide a detailed description of the considerations that were uncovered and how they were handled in preparing the data
Critical Thinking Assignment 1:	Apply both the min-max and standardization methods to normalize the age values in the given data, both before and after filling in missing data. Discuss which method is better for the given data set and why.
Critical Thinking Assignment 2:	Create a model on the provided data set to predict the value of the target. Determine the accuracy of the predicted value on the test data set. Graph the predicted values against the actual values.
Other Evaluation Methods:	Homework Problems, Laboratory Reports, Objective Exam, Quizzes, Written Homework
If Other:	
Instructional Methods:	Demonstration, Discussion, Field trips, Group Activities, Lecture, Multimedia presentations
If other:	
Work Outside of Class:	Answer questions, Problem solving activity, Required reading, Skill practice, Study
If Other:	
Up-To-Date Representative Texts:	McKinney, W. Python for Data Analysis. 3 rd Edition. O'Reilly Media, 2022. Nelli, F. Python Data Analytics. 3rd Edition. Apress, 2023. Mount, G. Advancing into Analytics. O'Reilly Media, 2021.
Alternative Texts:	Mount, G. Advancing into Analytics. O'Reilly Media, 2021.
Required Supplementary Readings:	
Other Required Materials:	
Requisite	
Category	
Requisite course:	
Requisite and Matching skill(s): Bold the requisite skill. List the corresponding course objective under each skill(s).	
Requisite Skill:	

Requisite Skill and Matching skill(s): Bold the requisite skill(s). if applicable	
Requisite course:	CIS 13 Computer Information Systems
Requisite and Matching skill(s): Bold the requisite skill. List the corresponding course objective under each skill(s).	Successful completion of this course requires a fundamental understanding of computers and the Internet. The student should also be proficient in using a Windows PC including computer terminology, file management, and software usage; Computer literacy. CIS 13 - Solve common business problems using appropriate information technology applications and systems. Demonstrate an understanding of the development and use of information systems in business. CIS 13 - Explain the development and use of information systems in business.
Requisite Skill:	
Requisite Skill and Matching skill(s): Bold the requisite skill. List the corresponding course objective under each skill(s). if applicable	
Enrollment Limitations and Category:	
Enrollment Limitations Impact:	
Course Created by:	R. DELLACA
Date:	11/01/2023
Original Board Approval Date:	01/21/2026
Effective Term:	FALL 2026