

De Anza College
Course Outline of Record Report
 09/05/2024

CISD011. : Foundations of Data Science for All

General Information

Faculty Initiator:	<ul style="list-style-type: none"> Clare Nguyen Pape, Mary
Attachments:	<p>ReqAdv_G_CIS_11_2025F_3.pdf</p> <p>ReqAdv_G_CIS_11_2025F_1.pdf</p> <p>ProgrammingPython_COA_CIS_11_2025F.pdf</p> <p>LowerDivision_CIS__11_2025F.pdf</p> <p>UCTransfer_DATAAC8_CIS_11_2025F.pdf</p> <p>ReqAdv_G_CIS_11_2025F_2.pdf</p> <p>Online_CIS_11_2025F.pdf</p> <p>Hybrid_CIS_11_2025F.pdf</p>
Course ID (CB01A and CB01B) :	CISD011.
Short Course Title:	No value
Course Title (CB02) :	Foundations of Data Science for All
Department:	CIS - Computer Sci and Info Systems
Effective Term:	Fall 2025
TOP Code (CB03) :	
CIP Code:	No value
SAM Priority Code (CB09) :	No value
Distance Education Approved:	Yes
Course Control Number:	No value
Curriculum Committee Approval Date:	06/18/2024
Board of Trustees Approval Date:	Pending
External Review Approval Date:	09/01/2025
Course Description:	This course builds the foundational concepts of data science for students in any major. By working with real-world data from a variety of disciplines such as economic, health, and social data, the course introduces students to basic statistical concepts and inferential thinking, as well as key programming concepts and analysis tools for exploring data.
Course Type (CB27) :	<ul style="list-style-type: none"> Lower Division
Mode of Delivery:	<ul style="list-style-type: none"> Online Hybrid
Faculty Initiator:	No value
Course Family:	Not Applicable

Associated Programs

Course is part of a program

Associated Program

No value

Award Type

No value

Active

Units and Hours

Summary

Minimum Credit Units	4.5
Maximum Credit Units	4.5
Total Course In-Class (Contact) Hours	66
Total Course Out-of-Class Hours	96
Total Student Learning Hours	162

Credit / Non-Credit Options

Course Credit Status (CB04)

Credit - Degree Applicable

Course Non Credit Category (CB22)

Credit Course.

Course Classification Code (CB11)

Credit Course.

Funding Agency Category (CB23)

Not Applicable.

Cooperative Work Experience Education Status (CB10)

Variable Credit Course

Weekly Student Hours

	In Class	Out of Class
Lecture Hours	4	8
Laboratory Hours	1.5	0
NA Hours	0	0

Course Student Hours

Course Duration (Weeks)	12
Hours per unit divisor	36
Course In-Class (Contact) Hours	
Lecture	48
Laboratory	18
NA	0
Total	66
Course Out-of-Class Hours	
Lecture	96
Laboratory	0
NA	0
Total	96

Learning Outcomes and Objectives

Course Objectives

Define data science concepts

Select the proper data types

Manipulate data in tables

Visualize and present data

Apply conditionals and iterations

Explore sampling and distributions

Examine inference, prediction, and models

CSLOs

Write short programs to collect data, apply statistical concepts, visualize, and analyze data

Expected SLO Performance: 0.0

Calculate and interpret basic statistics in a dataset and apply basic regression and classification techniques for predictions

Expected SLO Performance: 0.0

Outline

Course Outline

- A. Define data science concepts
 - 1. Uncertainty and causality
 - 2. Python and Jupyter Notebook
- B. Select the proper data types
 - 1. Numbers, expressions, functions
 - 2. Strings, arrays
 - 3. Tables
- C. Manipulate data in tables
 - 1. Functions for arithmetic
 - 2. Functions for creating and combining tables
 - 3. Functions for extracting data from tables
- D. Visualize and present data

1. Line plot
 2. Bar graph
 3. Scatter plot
 4. Histogram
- E. Apply conditionals and iterations
1. Boolean and conditional statements
 2. Repetition and iteration statements
 3. Randomness
- F. Explore sampling and distributions
1. Chance, iteration, and probability
 2. Sampling and empirical distributions
 3. Comparing two samples
 4. Percentiles, confidence intervals
 5. Mean, standard deviation
- G. Examine inference, prediction, and models
1. Correlation
 2. Regression: regression line, linear regression model
 3. Classification: k-nearest neighbor classification model

Lab Outline

- A. Use proper data types and expressions for calculations
- B. Read data into tables, compute and analyze statistical results
- C. Manipulate data in tables with groups, joins, pivots
- D. Use conditionals and iterations
- E. Use appropriate plots to visualize and interpret data
- F. Explore sampling and compare distributions
- G. Explore regression and apply linear regression model
- H. Explore classification and apply classification model