Glendale College

Course Outline of Record Report

Course ID 010713

Created - May 2024

CS/IS270 : Python for Data Science

General Information

Author:	• Simon Mirzayan
Course Code (CB01) :	CS/IS270
Course Title (CB02) :	Python for Data Science
Department:	CSIS
Proposal Start:	Fall 2025
TOP Code (CB03) :	(0707.10) Computer Programming*
CIP Code:	(11.0201) Computer Programming/Programmer, General.
SAM Code (CB09) :	Clearly Occupational
Distance Education Approved:	No
Will this course be taught asynchronously?:	No
Course Control Number (CB00) :	CCC000648035
Curriculum Committee Approval Date:	05/08/2024
Board of Trustees Approval Date:	11/19/2024
Last Cyclical Review Date:	05/08/2024
Course Description and Course Note:	CS/IS 270 introduce students to the fundamentals of using Python for Data Science. Students learn Interactive Python and Jupyter Notebook fundamentals and become familiar with popular Python tools and libraries most commonly used in the field of Data Science. Students learn how to use Python libraries such as NumPy, Pandas and Matplotlib to analyze and visualize data.
Justification:	New Course
Academic Career:	• Credit
Mode of Delivery:	• In-Person • Remote • Hybrid • Online
Author:	• Simon Mirzayan
Course Family:	No value

Academic Senate Discipline

Primary Discipline:	• Computer Information Systems (Computer network installation, microcomputer technology, computer applications)
Alternate Discipline:	No value
Alternate Discipline:	No value

Course Development

Basic Skill Status (CB08)

Course is not a basic skills course.

☐ Allow Students to Gain Credit by Exam/Challenge

Course Special Class Status (CB13)

Course is not a special class.

Pre-Collegiate Level (CB21)

Not applicable.

Grading Basis

- Grade with Pass / No-Pass Option

Course Support Course Status (CB26)

Course is not a support course

General Education and C-ID

General Education Status (CB25)

Not Applicable

Transferability

Transferable to both UC and CSU

Transferability Status

Pending

C-ID	Area	Status	Approval Date	Comparable Course
ITIS	Information Technology and Information Systems	Pending	No value	ITIS 130 – Introduction to Programming Concepts and Methodologies

Units and Hours

Summary

Minimum Credit Units (CB07)	3
Maximum Credit Units (CB06)	3
Total Course In-Class (Contact) Hours	90
Total Course Out-of-Class Hours	72
Total Student Learning Hours	162

Credit / Non-Credit Options

Course Type (CB04)

Credit - Degree Applicable

Noncredit Course Category (CB22)

Credit Course.

Noncredit Special Characteristics

No Value

Course Classification Code (CB11)

Credit Course.

☐ Variable Credit Course

Funding Agency Category (CB23)

Not Applicable.

☐ Cooperative Work Experience Education Status (CB10)

Weekly Student Hours

	In Class	Out of Class
Lecture Hours	2	4
Laboratory Hours	3	0
Studio Hours	0	0

Course Student Hours

Course Duration (Weeks)	18
Hours per unit divisor	54
Course In-Class (Contact) Hours	
Lecture	36
Laboratory	54
Studio	0
Total	90
Course Out-of-Class Hours	
Lecture	72
Laboratory	0
Studio	0
Total	72

Time Commitment Notes for Students

No value

Units and Hours - Weekly Specialty Hours

Activity Name	Type	In Class	Out of Class
No Value	No Value	No Value	No Value

Pre-requisites, Co-requisites, Anti-requisites and Advisories

Advisory

CS/IS151 - Python Programming (in-development)

Objectives

- Use basic programming concepts.
- Acquire a vocabulary of Python commands.

Entry Standards

Entry Standards	Description
No value	No value

Course Limitations

Cross Listed or Equivalent Course	Description
No value	No value

Specifications

Methods of Instruction

Methods of Instruction	Lecture
Methods of Instruction	Discussion
Methods of Instruction	Laboratory
Methods of Instruction	Demonstrations
Methods of Instruction	Presentations

Out of Class Assignments

- Projects (data analysis)
- Labs (using Interactive Python)

Methods of Evaluation	Rationale
Evaluation	Labs (using Interactive Python)
Exam/Quiz/Test	Exams
Project/Portfolio	Projects (Data Analysis)

Textbook Rationale

No Value

Textbooks

Author	Title	Publisher	Date	ISBN

Jake VanderPlas	Python Data Science Handbook	O'Reilly Media	January 17, 2023	978-1098121228

Other Instructional Materials (i.e. OER, handouts)

Description	Python Data Science Handbook
Author	Jake VanderPlas
Citation	No value
Online Resource(s)	https://jakevdp.github.io/PythonDataScienceHandbook/

Materials Fee

No value

Learning Outcomes and Objectives

Course Objectives

Identify Python libraries used in data science and use cases for each library.

Describe Interactive Python and how it is used in data science.

Discuss computations on NumPy arrays.

Employ IPython and IPython shell commands.

Manage errors and debugging.

Construct and use Pandas objects.

SLOs

Use Interactive Python to analyze data.	Expected Outcome Performance: 70.0
Explain data indexing and selection.	Expected Outcome Performance: 70.0
Create data aggregations and groupings.	Expected Outcome Performance: 70.0
Demonstrate data merge and join.	Expected Outcome Performance: 70.0

Additional SLO Information

Does this proposal include revisions that might improve student attainment of course learning outcomes?

No

Is this proposal submitted in response to learning outcomes assessment data?

No

If yes was selected in either of the above questions for learning outcomes, explain and attach evidence of discussions about learning outcomes.

No Value

SLO Evidence

No Value

Course Content

Lecture Content

Introduction to IPython and Jupyter Notebooks (4 hours)

- IPython Shell
- IPython Magic Commands
- Input and Output History
- Errors and Debugging

Introduction to NumPy (4 hours)

- Data Types in Python
- The Basics of NumPy Arrays

Computation on NumPy Arrays (4 hours)

- Comparisons and Masks
- Boolean Logic

Aggregations and comparisons on NumPy Arrays (4 hours)

- Summing
- Min and Max
- Multi dimensional aggregates

Indexing and sorting of NumPy Arrays (4 hours)

- Fast Sorting
- Partial Sorts

Introduction to Pandas (4 hours)

- Operating on Data in Pandas
- Handling missing data

Pandas objects (4 hours)

- Pandas Series
- Pandas Dataframes

Data indexing and selection (4 hours)

- Hierarchical Indexing
- Data Selection in DataFrame

Aggregation and grouping, merge and join (4 hours)

- Split, Apply and Combine
- Filter, transform, apply

Total Hours: 36

Laboratory/Studio Content

Introduction to IPython and Jupyter Notebooks (6 hours)

- IPython Shell
- IPython Magic Commands
- Input and Output History
- Errors and Debugging

Introduction to NumPy (6 hours)

- **D**ata Types in Python
- The Basics of NumPy Arrays

Computation on NumPy Arrays (6 hours)

- Comparisons and Masks
- Boolean Logic

Aggregations and comparisons on NumPy Arrays (6 hours)

- Summing
- Min and Max
- Multi dimensional aggregates

Indexing and sorting of NumPy Arrays (6 hours)

- Fast Sorting
- Partial Sorts

Introduction to Pandas (6 hours)

- Operating on Data in Pandas
- Handling missing data

Pandas objects (6 hours)

- Pandas Series
- Pandas Dataframes

Data indexing and selection (6 hours)

- Hierarchical Indexing
- Data Selection in DataFrame

Aggregation and grouping, merge and join (6 hours)

- Split, Apply and Combine
- Filter, transform, apply

Total Hours: 54

Additional Information

Is this course proposed for GCC Major or General Education Graduation requirement? If yes, indicate which requirement in the two areas provided below.

Yes

GCC Major Requirements

No Value

GCC General Education Graduation Requirements

Communication and Analytical Thinking

Repeatability

Not Repeatable

Justification (if repeatable was chosen above)

No Value

Resources

Did you contact your departmental library liaison?

No

If yes, who is your departmental library liason?

No Value

Did you contact the DEIA liaison?

No

Were there any DEIA changes made to this outline?

No

If yes, in what areas were these changes made:

No Value

Will any additional resources be needed for this course? (Click all that apply)

- No

If additional resources are needed, add a brief description and cost in the box provided.

No Value