**SYLLABUS – COP 1044 – DATA SCIENCE with PYTHON**

Section 2256

Spring, 2023

Live-Online Instruction

**INSTRUCTOR:**

**Name**: Professor Dawn Ellis

**Email**: Please use the communicate feature within the my|Courses framework to email me about the course.

**Office**: ES 213b, Clearwater Campus

**Office Hours:** Please see Instructor Course Page below

**Faculty Page** : <https://web.spcollege.edu/instructors/id/ellis.dawn>

**ACADEMIC DEPARTMENT:**

**Department: College of Computer & Information Technology (CCIT)**

**CCIT Dean:** Norene Kemp **Office Location:** St. Petersburg/Gibbs Campus, TE121

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**CCIT Assistant Dean:** John Long

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**Office Phone Number:** (727) 341-4620

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**Course Description:**

This course introduces the application of Python 3 modules to data science. Topics include Python for basic statistics, the NumPy module for manipulation of array-based data, Pandas for manipulation of heterogeneous and labeled data, Matplotlib for publication-quality visualizations, and IPython for interactive execution and sharing of code. Students will use Anaconda and Jupyter Notebooks software.

**Learning Outcomes and Objectives:**

1. **The student will demonstrate an ability to solve basic statistics problems with Python by:**
2. Coding programs that read text files and CSV (Comma Separated Values) files into Python data structures.
3. Writing code that uses Python data structures to calculate the mean, median, and mode.
4. Writing Python programs that calculate and plot frequency tables, variance, standard deviation, and quartiles.
5. Writing Python programs that calculate and plot the correlation between datasets.
6. Creating Python programs with Jupyter Notebooks and uploading them to Anaconda Cloud.

**2. The student will demonstrate a basic knowledge and use of NumPy arrays by:**

1. Writing programs that create and manipulate NumPy arrays and common attributes of NumPy arrays.
2. Writing Python programs using slicing and universal functions with NumPy arrays.
3. Writing programs that generate reports and plots from NumPy arrays and sharing them in the Anaconda Cloud.

**3. The student will demonstrate a basic knowledge and use of the Pandas module by:**

1. Coding Python programs that create Pandas objects by importing data from text files and CSV files.
2. Writing Python programs that view, select, and summarize data in Pandas Series and DataFrames.
3. Writing Python programs that clean and sort Pandas DataFrame data.
4. Creating statistical plots with matplotlib and seaborn modules and uploading them to Anaconda Cloud.

**REQUIRED TEXTBOOK:**

|  |  |
| --- | --- |
| Python for Data AnalysisAuthor: Scott McCoyPublisher: MurachISBN: 978-1-943872-76-3 |  |

**IMPORTANT DATES:**

Course Dates: 10/9/2023 – 12/8/2023

Other Dates: <http://www.spcollege.edu/academic-calendar/>

**COURSE OPERATIONS**

This is an introductory course in Data Science with Anaconda and Python 3. If you have questions or problems, **use the Course Forum**. Be specific when describing the issue. You can even paste in code that isn’t working for you. I will respond to Course Forum postings with tips and suggestions. You can do the same to help your classmates. Don’t fall behind. Get help right away to keep pace.

**Online Sections**
In online sections, students will meet the course objectives by reading the course text book and supplemental resources, trying example programs, watching instructional screen-capture videos, and completing Jupyter Notebooks assignments by specified due dates. Due dates can be seen in the Calendar, or by clicking Course Home. Students are advised to **set aside several evenings every week** for this course.

**Blended and Traditional (face-to-face) Sections**

In these sections, students meet the course objectives by attending computer lab sessions on campus and by studying at home. Your professor will manage learning activities during the computer lab sessions and provide instructions for home study duties. Home studies will include reading the course text book and supplemental resources, trying example programs, watching instructional screen-capture videos, and completing Jupyter Notebooks assignments by specified due dates. Due dates can be seen in the Calendar, or by clicking Course Home. Students are advised to **set aside at least six hours of own time weekly** for this course.

**OUR LEARNING MANAGEMENT SYSTEM**

Use your student ID number and password to login and access the resources for COP 1044. This course presents a sequence of modules that students work through in order. The modules are based on the Major Learning Outcomes for the course. Each module contains sub-tasks to be summarized in an original, creative Jupyter Notebook assignment.

A typical module has the following subtasks:

* Instructional content covering the skills and knowledge needed to meet the module objectives.
* A Jupyter Notebook with sample code and output that meets assignment requirements.

**Jupyter Notebooks**

All course assignments require students to develop a Jupyter Notebook using Anaconda software and JupyterLab. Students are encouraged to explore additional learning activities, too. For example, when studying example programs in the text book and examples, ideas for similar programs will often come to mind. Students are strongly urged to pursue these ideas and write their own original programs, and to share them with the class. There is no better way to learn. To become a proficient programmer, you must write computer programs. Lots of them!

**ATTENDANCE:**

Regular attendance is expected and will be taken at the start of every class in face-to-face and blended sections. In online sections, attendance will be based on progress as determined by the instructor. Attendance is crucial to keeping pace and eventual success.

**GRADING:**

This is a 100-point course, points being awarded according to the table below.

|  |  |  |
| --- | --- | --- |
| **ASSIGNMENT** | **DUE DATE** | **POINTS** |
| First Notebook | October 17 | 15 |
| Chapter 1 | October 24 | 20 |
| Chapter 2 | October 31 | 20 |
| Chapter 8 | November 14 | 20 |
| Chapter 10 | November 28 | 15 |
| Mybinder.org | December 5 | 10 |
|  | 100 points |

Grade Point Thresholds

|  |  |
| --- | --- |
| Grade A | 90 – 100 points |
| Grade B | 80– 89 points |
| Grade C | 70 – 79 points |
| Grade D | 60 – 69 points |
| Grade F | 0 – 59 points |

Note: A minimum grade of C is required for the A.S. Degree.

**ACADEMIC HONESTY:**

All students are expected to abide by the Honor Code <http://www.spcollege.edu/AcademicHonesty/>

**CODE OF CONDUCT:**

In addition to the academic honesty policy, all students are expected to adhere to the code of conduct.

* I will not share solutions to assignments unless invited to do so as part of the assessment.
* I will not take part in any activity that dishonestly enhances my own results, or dishonestly affects the results of other learners.
* I will use proper spelling, punctuation, and grammar in all course communications.
* I may engage in robust debate where appropriate to the learning experience, but I will not deliberately personally attack or offend others.
* I will not use racist, sexist, homophobic, sexually explicit or abusive terms or images, or swear words or language that might be deemed offensive.
* I will not participate in, condone or encourage unlawful activity, including any breach of copyright, defamation, or contempt of court.

**COLLABORATION RULE:**

As a rule, submitted programs must be entirely the work of the submitting student.

In comments in the drop box for each programming assignment, list:

* All collaborators, including SPC tutors.
* All written sources that you consulted, other than the *text* and course materials from this term.
* If you had no collaborators and consulted no written sources, then write, "I worked alone."
* If you somehow violate the collaboration policy, your best option is to tell us before we notice. Mistakes you confess are forgivable.

**GETTING HELP – STEPS TO TAKE**

1. There is a Course Forum where you can ask questions **abo**ut anything in this course. Your professor, or a classmate, will respond to help you.
2. You can email your instructor with a question. Attach the notebook you are working on.
3. You can seek out a tutor at a Learning Support Center. Look here: <http://www.spcollege.edu/tutoring/>
4. Your professor may also be available during office hours. Refer to your professor’s instructor page. Make an appointment and indicate the topic or part of the course for which you seek help.

**Above all, take action immediately to avoid falling behind! Do not procrastinate!**

At the 60% point of the course, students who are far behind might be dropped.

**GETTING TECHNICAL ASSISTANCE**

**Call 727-341-HELP (727-341-4357)**

Attendants are available at the number above from 7:00am to 12:00am (Midnight), 7 days a week, to assist you with technical issues related to MySPC, D2L, Student Email, and other technology related problems. You can also find help at <http://www.spcollege.edu/helpdesk/>

**SYLLABUS ACCEPTANCE POSTING:**

Students must make a posting to inform the instructor that they have read, understand, and will abide by the rules of the syllabus and all college policies. Adding a thread to the conversation opens the course modules.

**STUDENT SURVEY OF INSTRUCTION** (SSI):

The student survey of instruction is administered in courses each semester and is designed to improve the quality of instruction at St. Petersburg College. All student responses are confidential and anonymous and will be used solely for performance improvement. The SSI will show up near the end of the course. Please complete the SSI so we can improve our offerings.