Salisbury University Department of Mathematical Sciences

DSCI 218 : Introduction to Data Science
Syllabus (Tentative - Subject to Change)

Description: This course is an in-depth introduction to the principles of Data Science, with an emphasis on computational implementation in Python. Topics include: understanding types and organization of data, familiarity with Data Science tools, effective use of mathematics and algorithms in Data Science, and the ethics and responsibilities required in contemporary Data Science. This class meets 4 hours per week.

Spring 2026 Semester, 4 Hours Credit: **MTWF 11:00 – 11:50 a.m. in Room 127 Devilbiss Hall**

Instructor: Randall Cone (Professor/Dr. Cone)
Office: HS 116
Email: recone@salisbury.edu
Office Hours: MTWF 1:00 – 2:00 p.m., MW 3:00 – 4:00 p.m., or by appointment

Prerequisites: C or better in COSC 118 or program coordinator's approval (Note: COSC 117 or COSC 120 may count towards the prerequisite)

Intended Audience: This course is tailored for students enrolled in the Data Science Program and for those students with an interest in gaining insight into the fundamental practices of Data Science.

Objective: To introduce fundamental tools and practices used in the field of Data Science.

Textbooks: *"Data Science Foundations with Python", by Chan, Rissler, and Schwab-McCoy; zyBooks*

Topic	Weeks
What is Data Science? – Understanding the basics of Data Organization	2.0
How to effectively formulate well-defined questions about given data sets. Introduction to the organization and formats of data common to Data Science, such as CSV, text, JSON, SQL tables, and various binary formats.	
What are the Ethical Concerns in Data Science? – Responsible Data Science	1.0
Exploration of the ethical issues behind data use, data analysis, bias in models, issues of consent, and the impacts of big data on the modern world	
How do we Practically Implement Data Science with Modern Software Tools? – Tools of Data Science	2.0
Exploration of advanced data functions in Python; common Data Science packages for Python, such as: numpy, pandas, sklearn, and matplotlib; data wrangling; data pre-processing and exploratory data analysis. Use of AI as a tool and its implications may be introduced at the discretion of the instructor.	
What are the Foundations of Data Science? – Part I: Mathematics in Data Science	3.5
Introduction to the practical use of mathematical techniques in Data Science, including: linear algebra, set theory, descriptive and inferential Statistics, and calculus based optimization.	
What are the Foundations of Data Science? – Part II: Data Science Learning Algorithms	3.5
An introduction to supervised and unsupervised learning algorithms, interpretation of results, and model performance.	
How do we Implement Data Science Principles – Final Presentations	1.0
Students will present their results on a comprehensive Data Science project. This presentation will be based on the project that the students have proposed around mid-semester.	
Exams	1.0
Total	**14**

Evaluation

Homework, Quizzes, and Programming Assignments	25%
Final projects and presentations	20%
Midterm Exam(s)	40%
Final Exam	15%

A: 90-100 B: 80-89.9 C: 70-79.9 D: 60-69.9 F: Below 60

Student Learning Outcomes (SLO's): At the successful completion of the course, students should be able to:

1. Effectively formulate data related questions and how to obtain the relevant data
2. Describe the ethical concerns with the use and analysis of data for a data science project
3. Be able to use standard packages in python such as numpy, pandas, sklearn, matplotlib, etc. for data exploration and pre-processing
4. Apply techniques from linear algebra, set theory, calculus and statistics to analyze and interpret data.
5. Develop and apply appropriate learning model(s) to help answer data related question(s)

Attendance

Please attend class each day; classes are for your benefit. If you miss a class, you should request missed class notes from classmates. Please plan to ask questions during class time – it is honorable to ask questions.

Late Work

Work that is late without documented excuse will receive a 20% reduction in the grade for each class day it is late. Explanation documents with proper signature may be required for all reschedules.

Exercises and Activities

Students will have reading assignments from the Online textbook with practice exercises incorporated within the text. These will usually be due before class. Students will also have weekly Homework assignments from the text. These will give students practice with concepts and ideas talked about in class the previous week.

Programming Assignments and Challenge Quizzes

Programming Assignments will be assigned throughout the course. Challenge Quizzes on programming will be administered regularly throughout the semester and will be based on the Programming Assignments.

Midterm

Written midterm exam(s) will be given to assess students knowledge of concepts and implementation of tools. DH 127 computers will be available for use on indicated sections of these exams.

Final

A cumulative 2 part final exam will be given during the last week of classes.

Final Project

Students will investigate a dataset within the context of a comprehensive Data Science project, utilizing knowledge they have developed throughout the class. Students will develop a proposal for their project around mid-semester and work on it during the rest of the term. These activities will culminate in a final written report and an in-class presentation during the final week of classes.

Communication and MyClasses

MyClasses and email will be used extensively to make announcements and post course material. Please check your email at least once per day, and download and print the course material before the class. Additionally, if you want to share the material with anyone outside of this course, you must ask my permission — failure to do so violates copyright law.

Links to SU Course Policies and Procedures are provided via the sidebar in MyClasses.

Technology in Class

We will be using a computing lab for class once a week, but you may bring your own laptop. I ask that you use them in a way that does not distract your classmates. Please keep your cell phones in your bag or pocket. Python IDE, Jupyter notebooks, MyClasses, and the online textbook will be the only permissible items running on your computers during class time. Such software and access are available on all SU Lab computers. You can visit Academic Commons or Perdue Hall 141 for usage of Lab computers. We also have a dedicated lab Space in DH 127 that can be used outside of class time. If you need access contact **Kim Causey: kscausey@salisbury.edu**

Students with Disabilities

Any student registered with the Office of Access & Accommodations (OAA) who would like to utilize approved accommodations in their courses should contact their faculty members as soon as possible to arrange a meeting to coordinate any and all accommodations.

Students with disabilities can request reasonable accommodations, auxiliary aids and services, and/or modifications to University policies, through the OAA by following the OAA's procedures for Requesting Accommodations, Modifications, Aids, and Services. For more information, refer to the OAA page at https://www.salisbury.edu/administration/student-affairs/access-and-accommodations/ or contact the office at `accommodations@salisbury.edu` or the following address:

Office of Access & Accommodations
Guerrieri Student Union, Rm 229

Writing Across the Curriculum:

Students will be expected to communicate mathematics and mathematical ideas effectively in speech and writing. At the University Writing Center, trained consultants are ready to help you at any stage of the writing process. In addition to the important writing instruction that occurs in the classroom and during professors' office hours, the Center offers another site for learning about writing. **All students are encouraged to make use of these important services.**

NOTE:

Once a student has received credit, including transfer credit, for a course, credit may not be received for any course with material that is equivalent to it or is a prerequisite for it.