COURSE OUTLINE

COURSE NUMBER: DSA 5100

COURSE TITLE: Programming Foundations for Data Science and AI

SEMESTER HOURS: Three (3)

PREREQUISITE(S): CS 2030

SEMESTER: Fall 2023

INSTRUCTOR: Dr. Xiaodong Yue, GPEN, GWAPT

OFFICE HOURS: MT 12:00-2:30pm. Office hours will be conducted virtually through Zoom (https://ucmo.zoom.us/j/7824076722). In person office hours by appointment

OFFICE /PHONE: WCM 206C (Warrensburg) (660) 543-4847

E-MAIL: yue@ucmo.edu

LECTURE ZOOM MEETING LINK:

https://ucmo.zoom.us/j/99603970470?pwd=Y053WjNYQ1puTUh1TXp1bURBaUY5dz09

Meeting ID: 996 0397 0470
Passcode: dsa5100

CATALOG COURSE DESCRIPTION:

Introduction to Data Processing with Python. Topics include Data Crawling, Clearing, Reorganizing and Visualization using state-of-the-art Python Packages and Tools such as NumPy, Pandas, Matplotlib, Seaborn, Plotly, SciKit-Learn, etc.

TEXTBOOK:

Required: *Python Data Science handbook: Essential Tools for Working with Data (1st Edition). by Jake VanderPlas. ISBN-13: 978-1491912058 ISBN-10: 1491912057. Electronic book can be accessed at https://jakevdp.github.io/PythonDataScienceHandbook/*

Reference: *Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython (3rd Edition) by Wes McKinney. ISBN-13: 978-1491957660, ISBN-10: 1491957662. Electronic book can be accessed at https://wesmckinney.com/book/*

Python Tutorial: *https://www.w3schools.com/python/, https://docs.python.org/3/tutorial/*

COURSE GOALS:

Upon completion of this course, the student should be able to:

A. Build advanced Python scripts for processing and visualizing huge amounts of data.
B. Master Python programming language with a focus on data science and AI applications; understanding of basic syntax, programming, and commonly used packages for data manipulation and exploration.
C. Solve problems using an appropriate machine learning algorithm.

STUDENT RESPONSIBILITY:

1. Class attendance is **mandatory**.
2. All assignments must be turned in on the due date. Late assignments will **NOT** be accepted.
3. Any student found guilty of cheating is subject to disciplinary action, and may result in the grade of "F" for the course.

TOPICS:

I. Python Review
II. Intro. To NumPy
III. Data Manipulation with Pandas
IV. Visualization with Matplotlib, Seaborn and Plotly
V. Machine Learning with Scikit-Learn

METHOD OF INSTRUCTION:

The lecture format will be the basic mechanism used in the course. Computer demonstrations in the classroom will be used whenever appropriate.

Assessment of student performance will use a criterion-referenced model which will include programming assignments, written assignments, regular examinations, and a final examination.

EVALUATION:

Homework	30%
Midterm (October 6)	35%
Final (December 8)	35%
Total	100%

Letter grades are based on the following numeric scale:
A   90-100%
B   80-89%
C   70-79%
D   60-69%
F   0-59%

PLAGIARISM POLICY:

We believe in the free change of ideas. However, the transfer of ideas into written or machine format is the sole responsibility of the student submitting the work for grading. Therefore students are not to take credit for someone else's idea (where no mutual exchange occurred) nor

are they to take credit for someone else's written work. Any violation of this is considered a breech of professional computer science ethics. All parties collaborating in the plagiarism processes are equally liable.

Generative AI use (including, but not limited to, ChatGPT, Bard, Bing Chat) is not permitted in this course when you produce any work that it submitted for a grade. Unauthorized use of content produced by generative AI is considered plagiarism and is not therefore solely your own work. If you are found to have used generative AI to create or assist in the creation of work for this course you will be given a zero on the work and referred to academic affairs for potential further disciplinary action.

ACCESSIBILITY SERVICES

 Students with disabilities who are seeking accommodation should contact the Office of Accessibility Services at Union 222, 660-543-4421. If you want to share information about your needs that I should be aware of, such as emergency medical information or special arrangements for field trips or internships, please see me privately after class or during office hours.

SEXUAL DISCRIMINATION AND SEXUAL MISCONDUCT STATEMENT

The University of Central Missouri seeks to foster a safe and healthy environment built on mutual respect and trust. Sex discrimination, including sexual harassment, sexual violence, and other forms of sexual misconduct will not be tolerated. All faculty and most staff are considered mandated reports by the University and must disclose all information they receive about sexual misconduct to the Title IX Coordinator. As a faculty or staff member of the University, I am a mandated reporter. This means I am required to report information shared with me regarding sex discrimination and sexual misconduct.

If you, or someone you know, has experienced sex discrimination or sexual misconduct, please know assistance and options are available. UCM strongly encourages all members of the community to seek support and report incidents of this nature to the Title IX Coordinator. Anyone who wishes to report sexual misconduct, to learn more about the University process and options available, or to utilize a confidential resource, please visit ucmo.edu/titleix.

DIVERSITY, EQUITY, AND INCLUSION

The University of Central Missouri strives to develop a campus environment that welcomes and recognizes all dimensions of diversity and inclusiveness. What this means is that all students are welcomed in the classroom, and differences are to be recognized rather than erased or denied. Dimension of diversity can include sex, race, age, national origin, ethnicity, gender identity and expression, intellectual and physical ability, sexuality, income, faith, and non-faith perspectives, socio-economic class, primary language, family status, military experience, and more. Inclusive learning is facilitated by creative and innovative thought and mutual respect; being in this classroom means that you, your faculty member, and your peers pledge to foster a welcoming and equitable environment for all.