مركز الجودة والتطوير الأكاديمي

Course outline

الكلية الجامعية للعلوم التطبيقية
University College of Applied Sciences

Prerequisite
Computer Programming
Following Courses
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Textbook
Wes McKinney, "Python for Data Analysis Data Wrangling with Pandas, NumPy, and IPython", 2nd edition, 2018
Description
This course is concerned with the nuts and bolts of manipulating, processing, cleaning, and crunching data in Python. The student will learn building of various types of plots, and customizing them to be visually appealing and interpretable. Learn about the multi-dimensional array, an alternative to the Python list, and the pandas DataFrame. Creating and manipulating datasets, access the information from these data structures.

Essential Information	
Department	**Computer Engineering**
Major	**Data Science and Artificial Intelligence**
Course Title	**Data Science Programming**
Course Number	**DSAI 1303** **Lab: DSAI 1103**

Instructor Details	
Name	Dr. Shadi Abudalfa
Teaching Assistants	
Email	sabudalfa@ucas.edu.ps
Office Hours	9:30-11:00 Saturdays and Mondays

Recommended Readings
Charles R. Severance, "Python for Everybody, Exploring Data Using Python 3", 2016

References
https://www.w3schools.com/python/default.asp https://www.udemy.com/course/learning-python-for-data-analysis-and-visualization/ https://www.datacamp.com/tracks/data-analyst-with-python https://talentgarden.org/en/data/data-analysis-in-python-a-step-by-step-approach/ https://www.freecodecamp.org/learn/data-analysis-with-python/

Teaching Strategy	Evaluation Method	Weight	Objectives	Outcomes
• Traditional Method • Task -based learning • Project-Based Learning • Problem Based Learning • Case study	Quizzes	10	▪ Provide students with basic knowledge of data science in Python and problem solving. ▪ Use effectively a software development tool for Python programming. ▪ Provide comprehend theoretical concepts through practical examples. ▪ Strengthen programming capabilities to construct software systems of varying complexity. ▪ Enhance teamwork and communication skills. ▪ Engage in continuing professional development.	▪ Write python expressions. ▪ Use python's control structures in problem solving. ▪ *Learn to work with powerful tools in the NumPy array, and get started with data exploration.* ▪ *Building of various types of plots, and customizing them to be visually appealing and interpretable.* ▪ *Analysis, selection, and visualization techniques with Pandas DataFrames.*
	Attendance	5		
	Homeworks	15		
	Project	10		
	Midterm	20		
	Final Exam	40		
	Lab grades will be discussed with teaching assistants			

Lecture and Lab Schedule		
Lecture	**Lab**	**Week**
Overview of Python Programming Regular expressions Graphical User Interfaces	Overview of Python Programming	1
NumPy Basics	Regular expressions Graphical User Interfaces	2
Arrays and Vectorized Computation	NumPy Basics	3
Getting Started with pandas	Arrays and Vectorized Computation	4
Advanced pandas Quiz 1	Getting Started with pandas	5
Data Loading, Storage, and File Formats	Advanced pandas	6
Midterm		7
Data Cleaning and Preparation	Data Loading, Storage, and File Formats	8

Data Wrangling: Join, Combine, and Reshape Quiz 2	Data Cleaning and Preparation	9
Plotting and Visualization	Data Wrangling: Join, Combine, and Reshape	10
Data Aggregation and Group Operations Basic Statistics Manipulating Polynomials	Plotting and Visualization	11
Fundamentals of Database Machine Learning with Python	Basic Statistics	12
Data Analysis	Machine Learning with Python	13
Project Discussion		14
Final Exam (Practical)		15
Final Exam (Theoretical)		16

Course Policies

- ***Labs***: Lectures and labs are integrated and they complement each other. The requirements for the lab project will be discussed in the lab.
- ***Course Website & Participation***: Students are required to periodically check the course website on the Google Classroom and download course material as needed. Several resources will be posted through the website as well. Keys to exams are generally discussed during class as time permits but solutions will not be posted. A common Classroom will be

used for communication and interaction, posting and submitting assignments, posting grades, posting sample exams, etc. It is expected that you get benefit of the discussion board by raising questions or answering questions put by others. Your active participation and the usefulness of the material you share with other students will be rewarded.

- ***Attendance***: Regular attendance is an academic requirement; hence attendance will be checked each lecture and lab. Missing more than **6 lectures** or **three or more** unexcused labs will result in a Fail grade without prior warning. To avoid being considered as absent, an official excuse must be shown no later than one week of returning to classes.
- ***No makeup of tests will be given.***
- ***Re-grading policy***: If you have a complaint about any of your grades, discuss it with the instructor no later than a week of distributing the grades (except for the final). Only legitimate concerns on grading should be discussed.
- ***Office Hours***: Students are encouraged to use the office hours to clarify any part of the material that is not clear;
- ***Academic honesty***: Students are expected to abide by all the university regulations on academic honesty. **Cheating will be reported to the Department** and will be severely penalized. Although collaboration and sharing knowledge is highly encouraged, copying others' work (classmates, others or from the web) without proper citation, either in part or full, is considered plagiarism. Whenever in doubt, review the college guidelines or consult the instructor. **Cheating in whatever form will result in an Fail grade.**
- ***Courtesy***: Students are expected to be courteous toward the instructor and their classmates throughout the duration of this course. Students are expected to join the class on time. To contact your instructor, please use UCAS email whenever possible and avoid using phone calls or written notes.