ISOM 3400 - Python Programming for Business Analytics
Spring 2020

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Class Schedule: Monday 15:00 ~ 16:20 / Friday 10:30 ~ 11:50 at 2404

Lab Schedule:

LA1	Wed 18:00-18:50	LSK G021
LA2	Thurs 16:30-17:20	LSK G021
LA3	Thurs 15:00-15:50	LSK G021

Course Website: https://canvas.ust.hk

COURSE GOALS

This course will provide students with skills and knowledge of Python programming and experience in designing and developing business analytics applications.

LEARNING OUTCOMES

By the end of this course, students will be able to:

(1) Acquire general programming knowledge with Python language
(2) Able to process data with Python language
(3) Build some statistical and machine learning models with Python language
(4) Conduct programming with team members effectively

COURSE DESCRIPTION

Python has recently becoming the most popular general-purpose programming language according to many polls among programmers. The scripting nature of Python allows fast development and easy maintenance of applications. More importantly, the unparalleled community support makes Python increasingly powerful. In this course, students will learn Python programming language in the context of business data analytics. With the explosion of electronic data available to organizations and the demand for better and faster decisions, data driven intelligence becomes a key source of competitive advantage for business organizations. We believe that the combination of Python programming skills and business data analysis will provide high practical value to students majored in Information Systems as well as other related fields.

TEACHING APPROACH

In general, the teaching approach of this course is based on the notion of sustained, deep learning by applying knowledge through programming, hands-on practices, and assignments.

Teaching & Learning Activities	Roles in the Course	Learning Outcomes addressed
Lecture	Explain key concepts to students using an active learning approach, in-class exercise, and after-class discussion of questions.	1, 2, 3
Laboratory	Apply concepts presented in lectures to hands-on exercises.	1, 2, 3
Assignment	It requires students to apply their knowledge and understanding in programming to solve business analytics problems.	2, 3, 4

EVALUATION

An inevitable part of this end of any university course is the evaluation, and the grade. Actually, in any course, the most important evaluation is a student's self-evaluation, e.g., how many new and useful ideas and skills did you learn from the course? Has the course changed your view about yourself, work groups and organizations? If so, student efforts here will have paid off.

The goals of this course will be assessed in the following manner, and the percentage of grade may be broken down as follows:

Components	Percentage of the grade
A. In-class Exercises	30%
B. Assignments	30%
C. Final Exam	40%
TOTAL:	**100%**

A. In-class Exercises (30%)

There are about 6 to 7 in-class exercises throughout the semester. They will give you hands-on practice in Python programming in a setting where you can ask questions and collaborate with other students. By the end of the class, students' answers will be collected and graded. Students may score 2 (max), 1.5 (very good), 1 (good), or 0 (no good or no submission) for each exercise. All scores will count towards the final grade. **There will be NO makeup in-class exercises for whatever reasons.**

Use of laptops and mobile devices: You are required to bring a laptop or tablet to all lectures for practicing coding. When we are using these devices in class, you are asked to exercise discipline and stay on topic.

B. Assignment (30%)

There are **TWO** individual assignments, each counting towards 15% of the final grade. Details of the assignments will be provided later in the semester.

Late policy: Turn in your work early if there is any uncertainty about your ability to turn it in at the due time. Submissions up to 24 hours late will have their grade reduced by 25%; those up to 48 hours late will have their grade reduced by 50%. They will not be accepted for credit after two days.

Collaboration: You are encouraged to discuss in-class exercise and assignment problems with your fellow students. However, **the work you submit must be your own**. You must acknowledge in your

submission any help received on your assignments. **That is, you must include a comment in your homework submission that clearly states the name of the student, book, or online reference from which you received assistance.**

Submissions that fail to properly acknowledge help from other students or non-class sources **will receive no credit**. Copied work **will receive no credit.** Any and all violations **will be reported** to Heinz College administration.

All student are expected to comply with the HKUST policy on academic integrity. This policy can be found online at http://ugadmin.ust.hk/integrity/student-1.html.

What constitutes plagiarism in a coding class? The course collaboration policy allows you to discuss the problems with other students, but requires that you complete the work on your own. Every line of text and line of code that you submit must be written by you personally. You may not refer to another student's code, or a "common set of code" while writing your own code. You may, of course, copy/modify lines of code that you saw in lecture or lab.

You may find a discussion from the Computer Science and Engineering Department at the University of Washington helpful in understanding the bounds of the collaboration policy.

C. Final Exam (40%)

An open note final exam (without using computers) will be administered during final exams week if the circumstances permit. It will cover all lecture and lab materials, together with other materials used in this course.

Make-up policy: There will be no make-up exams except due to extraordinary circumstances beyond your control such as medical emergencies. Students have to submit appropriate documentation issued by a registered medical practitioner in order to be considered for a make-up exam.

Grade appeal: All scores will be uploaded to Canvas when ready. It is always the student's responsibility to check the scores and make sure they are correct. Any appeal to score has to be filed through email to imcharles@ust.hk. No appeal to a particular score is allowed 72 hours after its release.

D. Labs

In addition to in-class exercises, this course also has a complementary lab component, which further exposes you to more programming exercises. Although lab participation will not count towards the final grade, you are highly encouraged to make good use of lab hours to solve your puzzles and hone your programming skills.

LEARNING ENVIRONMENT

We welcome feedbacks on our teaching throughout the semester. You are encouraged to contact me or my TA any time you have any questions, suggestions, concerns, or would like to ask for advice.

MATERIALS

1. MAIN READING

This course has no required textbook. Lecture notes and required readings will be posted on the course website.

2. SUPPLEMENTAL READING

An Introduction to Statistical Learning, by Gareth James, Daniela Witten, Trevor Hastie and Robert Tibshirani 2013, Springer, ISBN 978-1-4614-7137-0. (Winner of the 2014 Eric Ziegel award from Technometrics). Downloadable from http://faculty.marshall.usc.edu/gareth-james/ISL/.

Many useful resources are also available online, for example, an online book *Object-Oriented Programming in Python* (https://python-textbok.readthedocs.io).

3. COURSE WEBSITE

Updates of the course contents and other information will be posted on the course website - http://canvas.ust.hk/. You are advised to check this site regularly throughout this course.

4. SOFTWARE

- Anaconda Navigator (for Win-64, OSX-64, or Linux-64):
  - Jupyter notebook
  - Python 3
  - Visual Studio Code
- Google Colaboratory

TENTATIVE LECTURE SCHEDULE

WEEK (M.)	TOPICS	ASSIGNMENTS/ DUE DATES
1 Feb. 21	Introduction to Python and Business Analytics	
2 Feb. 24 Feb. 28	Python Basics: Data, Data types, and Operators	
3 Mar. 2 Mar. 6	Data Structures: Tuples, Lists, Dictionaries, and Sets	In-class exercise
4 Mar. 9 Mar. 13		In-class exercise
5 Mar. 16 Mar. 20	Control Structures	
6 Mar. 23 Mar. 27	Functions and Classes	In-class exercise
7 Mar. 30 Apr. 3		In-class exercise Asg. 1 Release
8 Apr. 6 Apr. 10	*NumPy* Arrays and Vectorized Computation *Holiday*	
9 Apr. 13 Apr. 17	*Holiday*	Asg. 1 Due
10 Apr. 20 Apr. 24	Data Wrangling with *pandas*	
11 Apr. 27 May. 1	*Holiday*	In-class exercise Asg. 2 Release
12 May. 4 May. 8	Data Visualization with *matplotlib* and *seaborn*	
13 May. 11 May. 15	Intro to Machine Learning with Python	In-class exercise Asg. 2 Due
14 May. 18		

TENTATIVE LAB SCHEDULE

WEEK (M.)	TOPICS
19/20 Feb	Software installation and programming environment
26/27 Feb	Data, data types and operators
4/5 Mar	Strings
11/12 Mar	Data structures: Lists and Tuples
18/19 Mar	Data structures: Dictionaries
25/26 Mar	Control statements: if
1/2 Apr	Control statements: for, while statements
8/9 Apr	Functions and Classes
15/16 Apr	Assignment help/Revision
22/23 Apr	Data Visualization
29/30 Apr	Business Analytics Example 1 *(30th is holiday)*
6/7 May	Business Analytics Example 2
13/14 May	Summary

** Note both the lecture, lab, and assignment schedules are tentative and subject to change without notice.*