

# ISOM 3400 - Python Programming for Business Analytics

## Fall 2020

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**Office Hours:** By appointment

### Class Schedule:

#### Lecture

Section	Date	Time	Venue
L2	Monday	13:30 ~ 14:50	Zoom
	Friday	9:00 ~ 10:20	
L3	Monday	16:30 ~ 17:50	Zoom
	Friday	12:00 ~ 13:20	

#### Lab

Section	Date	Time	Venue
LA1	Thursday	15:00 ~ 15:50	Zoom
LA2	Thursday	9:00 ~ 9:50	Zoom
LA3	Thursday	12:00 ~ 12:50	Zoom
LA4	Thursday	10:30 ~ 11:20	Zoom

**Course Website:** <https://canvas.ust.hk>. Course materials and announcements will be posted on this site. You are advised to check it regularly throughout the course.

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#### 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

Components	Percentage of the grade
A. Class Participation	5%
B. In-class Exercises	10%
C. Assignments	40%
D. Final Exam	45%
<b>TOTAL:</b>	<b>100%</b>

### ***A. Class participation (5%)***

Class participation is a critical component of the learning experience. Students are expected to attend all real-time online lectures and labs (via Zoom), or watch Zoom video recording afterwards if attending real-time sessions are impossible. Students who have difficulty attending real-time sessions on a regular basis (e.g., due to time differences) shall contact the professor and the TA before Sept 21<sup>st</sup>. For those who are allowed to substitute watching video recordings for attending real-time sessions, you need to review all Zoom video recordings within one week after it is released on canvas in order to receive full credit for class participation.

### ***B. In-class Exercises (10%)***

There are about 6 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. 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.**

### ***C. Assignment (40%)***

There are **TWO** individual assignments, each counting towards 20% 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 the university administration.

All students 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.

### ***D. Final Exam (45%)***

An online proctored exam (open note) will be administered during final exams week. 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 [imsyeung@ust.hk](mailto:imsyeung@ust.hk). No appeal to a particular score is allowed 72 hours after its release.

### ***F. 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.

## MATERIALS

### 1. MAIN READING

This course has no required textbook. Lecture notes and extra exercises (either in pdf or ipynb format) 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. SOFTWARE

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

## OTHERS

### *Zoom Etiquette*

- **Turning on your camera** would be most appreciated. Your facial expressions and gestures are important sources of cues that could help me know what you have learned or what you have trouble with, so I could adjust my teaching accordingly. Using virtual background to protect your privacy is a good practice, but please note that it may cause delay when connection speed is low.
- Mute yourself upon entry to reduce background noises.
- Raise your hand at any time if you wish to speak or have a question.
- Using the chat function for course related discussion is encouraged.
- Please contribute as actively as you could during lectures and labs. Maintaining good interaction between you and me is the key to the success of online teaching and learning.

## LEARNING ENVIRONMENT

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

## TENTATIVE LECTURE SCHEDULE

WEEK (M.)	TOPICS	ASSIGNMENTS/ DUE DATES
1 Sep. 7 Sep. 11	Introduction to Python and Business Analytics Python Basics: Data, Data types, and Operators	
2 Sep. 14 Sep. 18	Data Structures: Lists, Tuples, and Dictionaries	
3 Sep. 21 Sep. 25	Control Structures: if, for, while, and try statements	In-class exercise
4 Sep. 28 Oct. 2	<i>Holiday</i>	
5 Oct. 5 Oct. 9		In-class exercise
6 Oct. 12 Oct. 16	Functions and Classes	
7 Oct. 19 Oct. 23		In-class exercise Asg. 1 Release
8 Oct. 26 Oct. 30	<i>Holiday</i> Web Scraping	
9 Nov. 2 Nov. 6		Asg. 1 Due In-class exercise
10 Nov. 9 Nov. 13	<i>NumPy</i> Arrays and Vectorized Computation Data Wrangling with <i>pandas</i>	
11 Nov. 16 Nov. 20		In-class exercise Asg. 2 Release
12 Nov. 23 Nov. 27	Data Visualization with <i>matplotlib</i> and <i>seaborn</i>	
13 Nov. 30 Dec. 4	Revision	In-class exercise Asg. 2 Due

## TENTATIVE LAB SCHEDULE

WEEK (M.)	TOPICS
Sep. 10	Software installation and programming environment
Sep. 17	Data, data types and operators
Sep. 24	Data structure: List, Tuples
Oct. 1	<i>Holiday</i>
Oct. 8	Data structures: Dictionaries
Oct. 15	Control statements: if
Oct. 22	Control statements: for, while statements
Oct. 29	Functions and Classes 1
Nov. 5	Functions and Classes 2
Nov. 12	Web scraping: Selenium 1
Nov. 19	Web scraping: Selenium 2
Nov. 26	Data Visualization: pandas
Dec. 3	Data Visualization: matplotlib

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