

# ISOM 3400 - Python Programming for Business Analytics

## Fall 2019

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**Class Schedule:** Monday 16:30 ~ 17:50 / Friday 12:00 ~ 13:20 at 2404

**Lab Schedule:**

LA1	Fri 13:30-14:20	LSK G021
LA2	Fri 15:00-15:50	LSK G021
LA3	Fri 16:30-17:20	LSK G021

**Course Website:** <https://canvas.ust.hk>

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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. In-class Exercises	10%
B. Assignments	40%
C. Final Exam	50%
D. <b>TOTAL:</b>	<b>100%</b>

### *A. Class participation (10%)*

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 (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 assignment early if there is any uncertainty about your ability to turn it in on the due date. Assignments up to 24 hours late will have their grade reduced by 25%; assignments up to one week late will have their grade reduced by 50%. After one week, late assignments will receive no credit.

### *C. Final Exam (50%)*

An open note final exam (without using computers) 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 [imcharles@ust.hk](mailto: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.

### **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://www-bcf.usc.edu/~gareth/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

### **OTHERS**

#### *Academic Integrity*

Academic integrity is a critical value of the university community. Integrity violations destroy the fabric of a learning community and the spirit of inquiry that is vital to the effectiveness of the University. We have absolutely no tolerance for cheating and there are no acceptable excuses. Anyone caught cheating, plagiarizing, and any other form of academic dishonesty will have their course grade lowered by at least one letter grade. In addition, we are bound to report any unethical behavior or evidence of dishonesty in this course to the University.

#### *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.

## TENTATIVE LECTURE SCHEDULE

WEEK (M.)	TOPICS	ASSIGNMENTS/ DUE DATES
1 Sep. 2 Sep. 6	Introduction to Python and Business Analytics Python Basics: Data, Data types, and Operators	
2 Sep. 9 Sep. 13		In-class exercise
3 Sep. 16 Sep. 20	Data Structures: Tuples, Lists, Dictionaries, and Sets	
4 Sep. 23 Sep. 27	Control Structures	In-class exercise
5 Sep. 30 Oct. 4		In-class exercise
6 Oct. 7 Oct. 11	<i>Holiday</i> Functions and Classes	
7 Oct. 14 Oct. 18		In-class exercise
8 Oct. 21 Oct. 25	<i>NumPy</i> : Arrays and Vectorized Computation	Asg. 1 Release In-class exercise
9 Oct. 28 Nov. 1	Data Wrangling with <i>pandas</i>	Asg. 1 Due In-class exercise
10 Nov. 4 Nov. 8	Data Visualization with <i>matplotlib</i> Data Mining with <i>scikit-learn</i> : Supervised Learning, Unsupervised Learning, and Model Selection and Evaluation	
11 Nov. 11 Nov. 15		Asg. 2 Release
12 Nov. 18 Nov. 22		Asg. 2 Due
13 Nov. 25 Nov. 29	Advanced BA topics Revision	

## TENTATIVE LAB SCHEDULE

WEEK (M.)	TOPICS
6-Sep	Software installation and programming environment
13-Sep	Data, data types and operators
20-Sep	Strings
27-Sep	Data structures: Lists and Tuples
4-Oct	Data structures: Dictionaries
11-Oct	Control statements: if
18-Oct	Control statements: for, while, try statements
25-Oct	Functions and Classes
1-Nov	Data Visualization with Pandas and Matplotlib
8-Nov	Business Analytics Example 1
15-Nov	Business Analytics Example 2
22-Nov	Business Analytics Example 3
29-Nov	Summary

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