

## ISOM3400: Python Programming for Business Analytics

(Mixed Mode Lite – limited interactions with online students)

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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) Conduct programming with team members effectively

### Course description

Python has recently become 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 majoring in Information Systems as well as other related fields.

**This is a programming course. Students are expected to learn from online materials by themselves. In the course, students are required to Google Python syntax that may not be covered in course materials but are required for performing course tasks, e.g., assignments.**

### Types of Students and Teaching Mode

**In-HK students:** Those in-HK students who are physically in Hong Kong are expected to attend classes, in-class exercises, and the final exam **in person**. Those students are **NOT allowed** to access our Zoom meeting unless special approval is granted.

**Not-in-HK students:** Those not-in-HK students who have been approved by ARRO are allowed to attend classes online using Zoom.

### Teaching Mode (Tentative): Mixed Mode Lite with Active Learning

- Both groups of students are required to attend classes either in person or online using Zoom.
- Class recordings will be uploaded to Canvas when they become available (usually take less than 24 hours).
- There is no class attendance requirement in this course.
- **Final exam:** In-HK students are required to attend a physical final exam. There will be no different exam arrangements for in-HK students. Not-in-HK students will have a take-home final exam, which has different questions than those in the physical final exam. The take-home exam and physical final exam are of equivalent grading criteria.
- For the Mixed Mode Lite teaching mode, there will be **limited interactions** between the course instructor and not-in-HK students. The course instructor will check messages in the chatroom once or twice during the class and **may NOT be able to reply to all messages**.
- **Active learning:** There will be many in-class activities, including in-class exercises in this course, and students are required to work on tasks together during the class. This helps students learn the topics more effectively.

## Assessment scheme

An inevitable part of this end of any university course is the evaluation and the grade. In any course, the most important evaluation is a student's self-evaluation. How many new and useful ideas and skills did students learn from the course? Has the course changed student views about themselves, workgroups, and organizations? If so, student efforts here will have paid off. The student's course goals will be assessed in the following manner, and the percentage of grade may be broken down as below:

Components	Learning outcomes assessed	Percentage of the grade
A. Assignment	1, 2, 3	30%
B. In-class Exercise	1, 2	30%
C. Final Exam	1, 2, 3	40%
<b>TOTAL:</b>		<b>100%</b>

### A. Assignment (30%) (Individual and group)

There are **TWO** assignments, namely assignment 1, and assignment 2. Students are expected to apply Python programming skills to solve practical business analytics problems.

#### Assignment 1 (individual) - (15%)

This is an individual assignment. Each student needs to submit his/her program by the deadline. A sample program is given. Students are required to modify the given program to make it work. The detailed grading criteria will be stated clearly in the assignment document.

#### Assignment 2 (group) - (15%)

This is a group assignment. A pre-assigned group is required to write a Python program to collect data from Web sites. The details will be announced later in the course. Student groups are required to make a video presentation (not more than 10 minutes).

**(Warning: Peer evaluation will be conducted after the deadline. Students should make sure they make a fair contribution to the submitted assignment. An independent judgement is applied to review each case, and an appeal on the decision is **NOT** allowed.)**

### B. In-class Exercise (30%) (Individual)

There are **THREE** in-class exercises throughout the semester, and they are all individual exercises. Students are expected to apply their Python programming skills and knowledge to solve business problems in the class. **By the end of the class, student's answers will be collected and graded.** Deductions resulting from mistakes and the use of Python will be made at the discretion of the grader. So, each student will have THREE in-class exercise scores, but only the **BEST TWO scores** will be counted toward the final grade. **There will be NO makeup in-class exercises for whatever reasons.**

During the in-class exercise session, all students are required to comply with the following guidelines and requirements. Some are for students joining the class via Zoom. Fail to do so will result in a mark deduction penalty, e.g., a 10% reduction in the marks.

- Attend the entire lecture (arriving late and leaving early are not acceptable)
- (Zoom only) Set the display name as follows (e.g., James (jkwok-20202020))
- (Zoom only) Turn on the camera at all times and make sure we can see your face clearly
- Submit your work/answer to Canvas (or via email) before the submission deadline

**Note:** It is the student's responsibility to ensure his/her Python development tools, including VS Code, Google Colab, notebook computer and others work during in-class exercises.

Late submission (our time stamp ONLY): Any late submission will result in ZERO marks. Students may submit to Canvas or by email to both instructor and TA. **Failure to comply with the stated submission rules will result in 30%-mark reduction.**

### C. Final Exam (40%)

There is a Final Exam, which covers **ALL topics** taught in the semester. Further information will be provided in the last class.

### Grade appeal

All scores will be uploaded to Canvas when ready. It is the student's responsibility to check their scores and make sure they are correct. Any score appeal must be filed through email to [jkwok@ust.hk](mailto:jkwok@ust.hk). No score appeal shall be allowed after a checking/appeal period (e.g., 36 hours after a score is released) if applicable.

*[If a student cannot come to check his/her paper during the checking period, the student's score will be finalized by default. I am afraid we will not change/correct his/her score after the checking/appeal period.]*

### Student learning resources

#### Text and Reference Books

There are no specific textbooks and reference books required for this course. We will use assorted readings posted on Canvas.

#### Course Website

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

## Software Requirements

- Google Colaboratory
- Visual Studio Code (VS Code)
  - o Python 3.7+

## Course schedule

The course is offered in lecture sessions and laboratory sessions.

L1	Wed	15:00-16:20	LSK Rm 1011 / Zoom (965 5387 0910)
	Fri	15:00-16:20	LSK Rm 1011 / Zoom (965 5387 0910)
LA1	Mon	09:00-09:50	G021, LSK Bldg / Zoom (997 2544 0282)
LA2	Tues	16:00-16:50	G021, LSK Bldg / Zoom (997 2544 0282)
LA3	Tues	15:00-15:50	G021, LSK Bldg / Zoom (997 2544 0282)

Tentative Course Schedule. Please visit Canvas for updated schedule, readings, and assignments.

## Schedule of Lecture (Tentative)

Wk.	Date	Topics	Assignment Release/Due
1	4-Feb	Introduction to Course and Programming	
1	9-Feb	Introduction to Python and Business Analytics	
	11-Feb	Data, data types and operators	
2	16-Feb	Data structures: Lists and Tuples	
	18-Feb	Data structures: Dictionaries 1	
3	23-Feb	Data structures: Dictionaries 2	
	25-Feb	Control statements: if 1	
4	2-Mar	Control statements: if 2	
	4-Mar	Control statements: for, while	
5	9-Mar	Control statements: try-except	
	11-Mar	<b>Class Practice</b>	Asg.1 Release (11-Mar)
6	16-Mar	<b>In-class exercise 1</b>	
	18-Mar	Functions and Classes 1	
7	23-Mar	Functions and Classes 2	
	25-Mar	Functions and Classes 3	
8	30-Mar	Functions and Classes 4	Asg.1 Due (30-Mar)
	1-Apr	Web automation – Selenium 1	
9	6-Apr	<b>In-class exercise 2</b>	
	8-Apr	Web automation – Selenium 2	Asg.2 Release (8-Apr)
	13-18 Apr	Mid Term Break	
10	20-Apr	Web automation – Selenium 3	
	22-Apr	Data Exploration 1 - pandas	
11	27-Apr	Data Visualization 1 - pandas	
	29-Apr	<b>In-class exercise 3</b>	
12	4-May	Data Exploration 2 - matplotlib	Asg. 2 Due (3 May)
	6-May	Data Exploration 2 - matplotlib	
13	11-May	Revision	

## Schedule of Laboratory (Tentative): LA1 – LA3

Wk.	Date	No.	Topics
1	7,8 Feb	LA01	Use of Colab, Setup of VS Code & Anaconda
2	12,14 Feb	LA02	Use of VS Code, virtual env., Python Package
3	21,22 Feb	LA03	Data and data types: Lists & Tuples
4	28 Feb, 1 Mar	LA04	Data structures: Dictionaries
5	7,8 Mar	LA05	Control statements: if-then-else, for & while statement
6	14,15 Mar	LA06	Function: try-except
7	21,22 Mar	LA07	Functions and Classes 1
8	28,29 Mar	LA08	Functions and Classes 2
9	4 Apr	LA09	Functions and Classes 3 (Lab video will be shared with students in LA2&3.)
10	11,12 Apr	LA10	Web automation: Selenium 1
10	19 Apr	LA11	Web automation: Selenium 2 (Lab video will be shared with students in LA1.)
11	25,26 Apr	LA 12	Web automation: Selenium 3
12	3 May	LA 13	Data Visualization (Lab video will be shared with students in LA1.)
13	10 May	LA 14	matplotlib (Lab video will be shared with students in LA1.)

**Policies for using ZOOM**

For those students who join the class via ZOOM, they are required to comply with the policies.

- A Zoom meeting ID is already released on Canvas
- Login Zoom with your HKUST Email
- Students are required to install Zoom before coming to the class
- Students must enter their display names as the first name, ITSC account name, and student ID. (e.g., **James (jkwok-20202020)**). When groups are formed, students must display their group numbers. (e.g., **James (jkwok-20202020), Group 1**)
- **Students will be given a unique meeting password after add/drop period. A separate email will be sent to individual students regarding the unique meeting password of the lecture**
- We will reserve the right to remove any student from the meeting if the student does not follow the rules.

**Teaching staff contact details**

Prof. Kwok's office is LSK 4080, 4th floor. Students are more than welcome to drop by any time with any of their questions. For any urgent matters, students may contact Prof. Kwok by phone (2358-7652), but the best way is by email. Prof. Kwok will check email frequently. Our Teaching Assistant (TA) for this course will be available for any questions regarding subject materials. Our TA is also responsible for grading and other administrative formalities.

**Academic honesty**

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. Prof. Kwok has 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, Prof. Kwok is bound to report any unethical behavior or evidence of dishonesty in this course to the University. Please remember the current university rule: "If a student is discovered cheating however minor the offense, the course grade will appear on the student's record with an X, to show that the grade resulted from cheating. This X grade stays on the record until graduation. If the student cheats again and "earns" another X grade, the student will be dismissed from the University." Plagiarism is copying anything (text or ideas) from another source without citing that source. If students use another person's idea, students must cite it, even if students rewrite the idea in their own words. Extreme care must be taken to avoid the passing of other's work as one's own. Students are required to provide appropriate citations when students use ideas and arguments or otherwise draw on others' work. If students use research from another source or the Web students MUST cite the source. This is true even if students use only the general idea and not the exact words.

**Learning environment**

Prof. Kwok welcomes feedbacks on his teaching throughout the semester. Students are encouraged to contact Prof. Kwok or our TA any time students have any questions, suggestions, concerns, or would like to ask for advice. After student groups are formed, Prof. Kwok will ask for one volunteer from each group (optional) to serve on the student feedback committee. The purpose of this committee is to act as a feedback channel for Prof. Kwok to improve his teaching and enhance student's learning experience. Prof. Kwok will meet with this committee to gather their feedback periodically. It would be a good opportunity if students wish to take a more active role in class management rather than waiting to submit their comments after the course is over.