

THE UNIVERSITY OF HONG KONG
HKU BUSINESS SCHOOL

IIMT3643 Data visualization and visual analytics
2022-2023, Semester 2, Subclass 2A

General Information

Instructor: Dr. DENG, Yipu
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Office location: KK Leung Building Room 1308
Consultation times: Wednesday, 1:30-3:30 p.m.

Teaching Assistant: TAM, Eric
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Tutor consultation times: TBA (check MOODLE course page)

Course Website: Moodle

Pre-requisites: None

Textbook (optional): *Data visualization: exploring and explaining with data*, by Camm, J., Cochran, J., Fry, M., & Ohlmann, J. Cengage Learning, 2021.

Practical tableau: 100 tips, tutorials, and strategies from a Tableau zen master, by Sleeper, R., O'Reilly Media, Inc., 2018

Course Description

Data visualization is an essential skill required in today's data driven world. With its foundations rooted in statistics, psychology, and computer science, practitioners in almost every field use visualization to explore and present data. This course shows you how to better understand your data, present clear evidence of your findings to your intended audience, and tell engaging data stories that clearly depict the points you want to make all through data graphics. The skills learned in this course offer enormous value for creatives, educators, entrepreneurs, and business leaders in a variety of industries. Whether you are a seasoned visualization designer or just learning about it now, this course will serve as an introduction and reference to becoming visual with data.

The course involves individual homework, exams, and projects. You will demonstrate your mastery of the material by applying what you learn. Some assignments will be well specified; others may be purposely less specific or less structured because an objective of these assignments is for you to not only solve the problem posed, but also to learn how to be creative in visualizing data.

Class sessions will comprise 1) lectures/discussions of various data visualization concepts, 2) instructor laboratory demonstrations, and 3) student lab sessions. The purpose of this pedagogical approach is to introduce and reinforce ideas and skill sets so that students can master these on their own after class hours. You will be a critical element in class sessions, which will usually be interactive. You are strongly encouraged to ask questions to clarify and expand the covered material. Each class will provide important information. ***It is your responsibility to get this information if you are unable to attend a class.*** Class materials and discussions will often supplement the textbook and other readings.

Course Objectives			
<p>The course aims to provide students with the foundations necessary for understanding and extending the current state of the art in data visualization. Upon successful completion of the course, you should be able to do the following:</p> <ul style="list-style-type: none"> • Present data with visual representations for your target audience, task, and data; • Experiment with and compare different visualization tools; • Create multiple versions of digital visualizations using various software; • Employ cutting edge tools and technologies to analyze Big Data; • Identify appropriate data visualization techniques given particular requirements imposed by the data; • Apply appropriate design principles in the creation of presentations and visualizations; and • Analyze, critique, and revise data visualizations. 			
Faculty Learning Goals (FLGs)			
<p>FLG1: Acquisition and internalization of knowledge of the programme discipline FLG2: Application and integration of knowledge FLG3: Inculcating professionalism FLG4: Developing global outlook FLG5: Mastering communication skills FLG6: Cultivating leadership</p>			
Course Learning Outcomes (CLOs)		Aligned FLGs	
CLO1	Understand the key concepts about visualization techniques and visual analytics.	1 & 3 & 6	
CLO2	Identify and evaluate the key issues in the application of visualization techniques.	2 & 3 & 6	
CLO3	Demonstrate effective use of visualization tools for data analysis.	1	
CLO4	Learn how to obtain and present insights from data visualization.	2 & 5	
CLO5	Develop problem solving skills through data visualization and visual analytics.	2	
Course Teaching and Learning Activities (T&L)		Expected contact hours	Study load (% of study)
T&L1. Interactive lectures and discussions		25	29%
T&L2. In-class quizzes		5	6%
T&L3. Assignments		15	18%
T&L4. In-class practice		25	29%
T&L5. Self-study and self-training		15	18%
Total		85	100%

Assessments	Brief Description	Weights	Aligned CLOs
A1. Participation	Interactions and discussions.	10%	1 & 2
A2. Quizzes	In-class quizzes.	10%	1 to 3
A3. Assignments	Take-home assignments.	30%	1 to 4
A4. Midterm exam	One midterm examination.	25%	1 to 5
A5. Project	One Group Project.	25%	1 to 5
	Total	100%	
Course Grade	Grade Descriptors		
A+, A, A-	The student is able to apply all the methods learned in the course to new, unexpected situations, independently and in a novel manner that goes beyond expectations of a good student. Student has achieved an impressive mastery of course content.		
B+, B, B-	The student is able to apply the methods learned in the course, but only under partial guidance. Student has achieved a basic mastery of course content, and thus meets expectations.		
C+, C, C-	The student understands conceptually most of the methods learned, but cannot apply them all, even under guidance. Performance is that of an average student and content knowledge is that of a novice, which is below expectations.		
D+, D	The student has shown some effort but has a highly limited understanding of course content. Performance and content knowledge are poor and not to the level expected for a future data analytics professional.		
F	The student has shown little effort or understanding toward course content. Performance and content knowledge are completely unacceptable.		
Course Policies			
<p>A. Lectures</p> <p>I will present the fundamental concepts and the related business examples. However, I intend the lectures to be highly interactive to motivate active learning and continuous participation. You will learn the class topics by following the presentation as well as interjecting with your questions and responses to the questions I pose. A portion of class time will involve demos of Excel and Tableau. You will build your data visualization skills by following my demos.</p> <p>B. Quizzes</p> <p>To reinforce the class topics, I will provide in-class problems. This is a chance to check your knowledge. The idea of these exercises is to allow you to immediately apply the skills presented in lectures to relevant business problems; and the interactive classroom environment invigorates the learning process.</p>			

C. Exam

One exam will be administered during the semester. If an exam will be missed because of a University-excused absence, you must notify the instructor **BEFORE** the exam. When an exam is missed due to a University-excused absence (and prior notice is provided), the exam will be rescheduled by the instructor. The format of the make-up exam may vary from the formats of regularly scheduled exams. The instructor has the sole right to make determinations concerning the potential for make-up exams.

D. Individual Homework and Tutorial Sessions

There will be three individual assignments and answers will be given at the tutorial sessions. The assignments will require you to work with data and use various technologies to create data visualizations. All assignments should be submitted online through Moodle before the specified deadlines. Late assignments are not accepted. Assignments will be graded for both effort and accuracy, and you should devote considerable time to solving these problems and showing detailed steps of the solutions. Practicing the problem-solving skills is essential for truly acquiring them. The tutorial sessions are valuable complements to the practice questions, as you will learn through active participation in the discussion carried out by Mr. Eric Tam. Additional problems may also be discussed every week during the tutorial. Tutorial participation will be assessed based on students' performance.

E. Group Project

You will form or be assigned to a team **with** three to four **people to** work on the project. This project is an opportunity for you to create a series of data graphics based on data that you select. You will create **data** visualizations based on your defined audience, data, and tasks. You will present visualizations to the class in the form of a compelling story. Each part of the project must be submitted online through Moodle before the specified deadlines.

In order to assess the contributions of individual group members in different parts of the project, peer evaluation forms will be supplied near the end of the semester. You are required to provide feedback on the contributions made by the other members of your group using these forms. The filled-out forms are due by the end of **Apr 28**. ***Failure to turn them in by this due date will result in a 25% reduction in your own peer evaluation grade.***

F. General Course Policies and Expectations

- Any student in this course who has a disability that may prevent him or her from fully demonstrating his or her abilities should contact the instructor personally, as soon as possible, so accommodations necessary to ensure full participation and facilitate your educational opportunities can be discussed.

Students who are having problems with test taking (or any activities) in this class are highly encouraged to contact their instructor for help as soon as they recognize that there is a problem to obtain the necessary guidance.

- Exams, project deliverables, and individual assignments will be considered for re-grading **only if a request is made** to the instructor and the tutor, along with a written explanation, **within five business days** since the graded items are returned.
- Students are expected to arrive in class on time and stay through the entire class. If a student must be late coming to a class or must leave a class early for unavoidable reasons, he or she **should notify the instructor in advance.**

- Students are expected to respect the rights of their classmates by exhibiting courteous and professional behavior that is conducive (or not disruptive) to the learning environment of the classroom. ***Cell phones should be turned off or put on silent ring or vibrate.*** Phone calls should not be made or taken during the class period (this includes text messaging or instant messaging). If there is an emergency situation that prevents you from adhering to this policy, please see your instructor to discuss it as soon as possible.
- Students are strongly encouraged to collaborate with their group members while working on the project. In fact, the ***capability to work in a group and learn from one another in the group is an important objective of this course.*** On the other hand, ***any type of collaboration during an exam is strictly prohibited.***
- The highest academic integrity is expected of all students. ***Any deviation from this will be treated harshly.*** For details concerning academic integrity, please check: [Handbook for Undergraduates](#)
- As mentioned before, students are ***expected to take every exam at the scheduled time and location.*** In a case where serious emergency prevents a student from doing so, the instructor must be notified immediately. All emergencies and absences must be documented by the appropriate authority (e.g., the health-care provider concerned in the case of a medical emergency).
- All students in the course are expected to have (and frequently check) an e-mail account. ***Students are responsible for updating Moodle to reflect their current e-mail address and phone contact information.***
- In the event of a major campus emergency or severe weather condition, the university may decide to delay, dismiss, or cancel classes and/or other routine operations. Such decisions will be communicated to the university community by various means, including postings on the ***university's website.*** Information regarding changes in any requirements of this course necessitated by such decisions may be obtained from the ***course website*** or by ***contacting the instructor.***

Means/Processes for Student Feedback on Course

X Participation in SETL around the end of the semester.

Tentative Course Schedule*		
Week	Date	Topics
1	Jan 20	- Introduction to Data Visualization - Data Viz in Excel
2	Jan 27	- The Lunar New Year
3	Feb 3	- Data Viz in Excel
4 [#]	Feb 10	- Design of Data Viz - <i>Project group member list due on Feb 10</i>
5	Feb 17	- Basic Data Viz in Tableau
6 [^]	Feb 24	- Basic Data Viz in Tableau
7	Mar 3	- Basic Data Viz in Tableau
8	Mar 10	- Reading/Field Trip Week
9	Mar 17	- Basic Data Viz in Tableau
10 [#]	Mar 24	- Storytelling with Data Viz
11	Mar 31	- Storytelling with Data Viz
12	Apr 7	- General Holiday
13	Apr 14	- Advanced Data Viz in Tableau
14	Apr 21	- Advanced Data Viz in Tableau
15 ^{#^}	Apr 28	- Group Project Presentation
<i>Midterm Exam</i>		
<i>On Mar 18 (Sat)</i>		

* Due dates and exam dates are subject to change. Please check Moodle for updated information.

Individual assignment due in that week.

[^] Group milestone due in that week.