

### COURSE INFORMATION

Course title:	Data Visualization	Credits:	1.5
Course code:	BAIT518	Class location:	HA 132
Session, term, period:	2021W	Class times:	Tue/Thur 2:00-4:00 PM
Section(s):	001	Pre-requisites:	
Course duration:	2022-01-04 – 2022-02-10	Co-requisites:	n/a
Division:	Marketing & Behavioural Science		
Program:	MBA		

### INSTRUCTOR INFORMATION

Instructor:	Chunhua Wu	Office location:	HA572
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Office hours:	Thu 10:00-11:00AM		
Teaching assistant:	Cindy Chen (MBA 2022)		
Email:	<a href="mailto:Cindy.chen@sauder.ubc.ca">Cindy.chen@sauder.ubc.ca</a>		

### COURSE DESCRIPTION

*For every leader in the company, not just for me, there are decisions that can be made by analysis. These are the best kinds of decisions! They are fact-based decisions.*

— Jeff Bezos

We live in the data age. Firms are increasingly relying on data-driven analytics in the decision process to stay competitive in the market. A data-driven mindset and solid analytical skills have become essential for today's managers.

Humans are visual animals. The first step towards data-driven decision making is the ability to "see" the data. Effective data visualization helps managers understand business operations, identify business problems, seize market opportunities, and enhance business performance.

Data visualization is the process of getting data, organizing data, exploring data, and presenting data in a visual way. It is not only about the databases, the software tools, the statistics, the tables, and the graphics; it is also fundamentally a form of communication that achieves purposes and delivers impacts.

This course outlines important data visualization topics in a business context. Throughout the term, we will review data, statistics, economics, and visualization concepts, practice efficient software tools, and more importantly, navigate the purpose-driven aspect of data visualization. The class will equip students with a thorough understanding of visual principles, practical frameworks in exploring business data, and solid skills in creating compelling data visualizations.

### COURSE FORMAT

The course consists of a mix of lectures, pre-recorded videos, software tutorials, assignments, and invited guest sessions. All class sessions will be interactive, requiring you to actively participate in and contribute to the class.

### LEARNING OBJECTIVES

By the end of the course, students are expected to be able to:

- Understand the importance of business data visualization as a communication tool.
- Understand the principles of visual perceptions and visual communications.
- Create effective data visualizations using tools such as Tableau.
- Design and execute database query languages such as BigQuery to perform data operations.
- Apply data visualization and business analytics frameworks to analyze a business situation.

### ASSESSMENTS

#### Summary

<u>Component</u>	<u>Weight</u>
Individual Assignments	30%
Group Assignments	35%
Final Exam	25%
Class Participation	<u>10%</u>
Total	<u>100%</u>

#### Details of Assessments

##### Assignments (65%)

You are expected to finish three individual assignments and two group assignments during the course period. You will have time to discuss and finish part of the group assignments in class. The five assignments account for 65% of the course grade. The assignments are designed to give you the opportunity to link the lecture contents with real-world practices and applications. Details of the assignments will be posted on Canvas.

- **Assignment 0 (optional, individual):** Self Introduction (0%)
- **Assignment 1 (individual):** Data Visualization in Life (10%), due by *January 5, 11:59pm*.
- **Assignment 2 (individual):** Visualize Summary Statistics (10%), due by *January 12, 11:59pm*.
- **Assignment 3 (individual):** Intermediate Visualization (10%), due by *January 19, 11:59pm*.
- **Assignment 4 (group):** Data Visualization Comprehensive (20%), due by *January 26, 11:59pm*.
- **Assignment 5 (group):** Yelp Review (15%), due by *February 5, 11:59pm*.

### Final Exam (25%)

You are expected to finish an in-person final exam during the exam week (TBD by RHL). It accounts for 25% of the course grade. The exam will be comprehensive, covering all the learning modules of the course.

### Participation (10%)

You are expected to attend all the synchronous classes and actively participate in class discussions. Class participation accounts for 10% of your final course grade and is used to reward students for contributing to the in-class learning environment. You earn the participation points only if you are an active participant and contributor to the learning. Participation points will be deducted if you are late to the classes.

## LEARNING MATERIALS

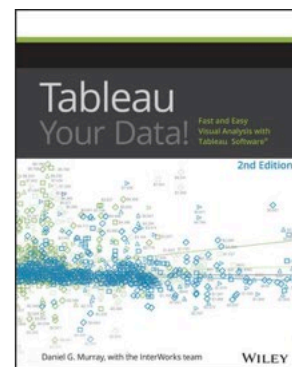
### Textbooks

The following book serves as an optional textbook for this course (highly recommend you getting a copy). The relevant chapters to read are marked in the preparation section of the course schedule below. In addition, we will use customized materials.

- Scott Berinato, 2006. [Good Charts: The HBR Guide to Making Smarter, More Persuasive Data Visualizations](#). Harvard Business Publishing.

I also recommend the following book as a technical reference to Tableau Software (You can get free access through UBC Library).

- Daniel Murray, 2016. [Tableau Your Data!](#). Wiley.



### Reading Materials

Other reading materials will be posted on Canvas.

### Software Tools

We will learn the basics of two software tools for this course: Tableau and Google BigQuery. You are required to install the software and get familiar with the interface by yourself.

**Tableau:** Please install the software (Tableau Desktop) on your computer by *January 10<sup>th</sup>, 2022*.

- Download URL: <http://www.tableau.com/tft/activation>.
- Student evaluation license: TBD
- Other resources: Tableau website.

**BigQuery:** Please register an account for Google Cloud by *January 25<sup>th</sup>, 2022*.

- URL: <https://cloud.google.com>.

### COURSE-SPECIFIC POLICIES AND RESOURCES

#### *Missed or late assignments, and regrading of assessments*

Per the standard for RHL courses, late submissions will not be accepted and will receive a grade of zero.

#### *Group Policy*

You will form a group based on your own preferences. Each group will have 3-4 members. Please contribute the best you can to the group assignments. In the case that you feel other members of your group are not pulling their weights, or are disrupting the functioning of the group, try to resolve the issue as a group. If you need further assistance you may always contact the instructor for help. We will conduct formal peer evaluations at the end of the course. Each member will have the opportunity to evaluate the efforts and contributions of others. In the case that the intra-group evaluations indicate a problem, the individuals who did not pull in their weights will receive discounted grades.

#### *Academic Concessions*

If extenuating circumstances arise, please contact the RHL Graduate School program office as early as reasonably possible, and submit an [Academic Concession Request & Declaration Form](#) <https://webforms.sauder.ubc.ca/academic-concession-rhlee>. If an academic concession is granted during the course, the student will be provided options by RHL, or by the instructor in consultation with RHL, per [UBC's policy on Academic Concession](#).

### POLICIES APPLICABLE TO COURSES IN THE ROBERT H. LEE GRADUATE SCHOOL

#### *Attendance*

Excepting extenuating circumstances, students are expected to attend 100% of their scheduled class hours. Absent students limit their own academic potential, and that of their classmates, and cause unnecessary disruption to the learning environment. Students missing more than 20% of the total scheduled class hours for a course (including classes held during the add/drop period) without having received an academic concession will be withdrawn from that course. Withdrawals, depending on timing, could result in a "W" or an "F" standing on the transcript.

#### *COVID-19 Policies for Attendance & Academic Concessions:*

If a student feels unwell, they should stay home and send a courtesy email to each impacted instructor and cc their program manager. The student should also submit an [Academic Concession Request & Declaration Form](#).

If a student suspects possible COVID-19 infection, they should use the BC Ministry of Health's [self-assessment tool](#), to help determine whether further assessment or testing for COVID-19 is recommended.

If a student is required to self-isolate (e.g., while waiting for test results), they should follow the steps above (stay home, email instructor(s) and program manager, submit an [Academic Concession Request & Declaration Form](#), and follow BC Health Guidance.

Students who are required to quarantine, should get in touch with their Program Manager to discuss the possibility of academic concessions for each impacted course. The Program Manager will work closely with your instructors to explore options for you to make up the missed learning.

*COVID-19 Safety in the Classroom:*

**Masks:** Masks are **required** for all indoor classes, as per the BC Public Health Officer orders. For our in-person meetings in this class, it is important that all of us feel as comfortable as possible engaging in class activities while sharing an indoor space. For the purposes of this order, the term “masks” refers to medical and non-medical masks that cover our noses and mouths. Masks are a primary tool to make it harder for COVID-19 to find a new host. You will need to wear a medical or non-medical mask for the duration of our class meetings, for your own protection, and the safety and comfort of everyone else in the class. You may be asked to remove your mask briefly for an ID check for an exam, but otherwise, your mask should cover your nose and mouth. Please do not eat in class. If you need to drink water/coffee/tea/etc, please keep your mask on between sips. Students who need special accommodation are asked to discuss this with the program office.

**Seating in class:** To reduce the risk of COVID-19 transmission, please sit in a consistent area of the classroom each day. This will minimize your contacts and will still allow for the pedagogical methods planned for this class to help your learning.

Visit the following website for the most recent updates regarding COVID-19 protocol on campus:  
<https://students.ubc.ca/campus-life/returning-to-campus>

*Punctuality*

Students are expected to arrive for classes and activities on time and fully prepared to engage. Late arrivals may be refused entry at the discretion of the instructor or activity lead. Students arriving later than halfway through a scheduled class will be treated as absent for that class.

*Electronic Devices*

Devices such as laptops, tablets, and cell phones are not permitted to be used in class unless directed by the instructor for in-class activities. Students who do not follow the School’s policy in this regard may be required to leave the room for the remainder of the class, so that they do not distract others. Research shows that students’ use of laptops in class has negative implications for the learning environment, including reducing their own grades and the grades of those sitting around them.

*Citation Style*

Please use the American Psychological Association (APA) reference style to cite your sources.

Details of the above policies and other RHL Policies are available at:  
<http://www.calendar.ubc.ca/vancouver/index.cfm?tree=12,199,506,1625>

**UNIVERSITY POLICIES AND RESOURCES**

UBC provides resources to support student learning and to maintain healthy lifestyles but recognizes that sometimes crises arise and so there are additional resources to access including those for survivors of sexual violence. UBC values respect for the person and ideas of all members of the academic community. Harassment and discrimination are not tolerated nor is suppression of academic freedom.

UBC provides appropriate accommodation for students with disabilities and for religious observances. UBC values academic honesty and students are expected to acknowledge the ideas generated by others and to uphold the highest academic standards in all of their actions. Details of the policies and how to access support are available on the UBC Senate website at <https://senate.ubc.ca/policies-resources-support-student-success>.

### *Respect for Equity, Diversity, and Inclusion*

The UBC Sauder School of Business strives to promote an intellectual community that is enhanced by diversity along various dimensions including status as a First Nation, Metis, Inuit, or Indigenous person, race, ethnicity, gender identity, sexual orientation, religion, political beliefs, social class, and/or disability. It is critical that students from diverse backgrounds and perspectives be valued in and well-served by their courses. Furthermore, the diversity that students bring to the classroom should be viewed as a resource, benefit, and source of strength for your learning experience. It is expected that all students and members of our community conduct themselves with empathy and respect for others.

### *Academic Integrity*

The academic enterprise is founded on honesty, civility, and integrity. As members of this enterprise, all students are expected to know, understand, and follow the codes of conduct regarding academic integrity. At the most basic level, this means submitting only original work done by you and acknowledging all sources of information or ideas and attributing them to others as required. This also means you should not cheat, copy, or mislead others about what is your work. Violations of academic integrity (i.e., misconduct) lead to the breakdown of the academic enterprise, and therefore serious consequences arise and harsh sanctions are imposed. For example, incidences of plagiarism or cheating may result in a mark of zero on the assignment or exam and more serious consequences may apply if the matter is referred to the President's Advisory Committee on Student Discipline. Careful records are kept in order to monitor and prevent recurrences.

### **COPYRIGHT**

All materials of this course (course handouts, lecture slides, assessments, course readings, etc.) are the intellectual property of the instructor or licensed to be used in this course by the copyright owner. Redistribution of these materials by any means without permission of the copyright holder(s) constitutes a breach of copyright and may lead to academic discipline and could be subject to legal action. Any lecture recordings are for the sole use of the instructor and students enrolled in the class. In no case may the lecture recording or part of the recording be used by students for any other purpose, either personal or commercial. Further, audio or video recording of classes are not permitted without the prior consent of the instructor. Students may not share class Zoom links or invite others who are not registered to view sessions.

### **ACKNOWLEDGEMENT**

UBC's Point Grey Campus is located on the traditional, ancestral, and unceded territory of the xwməθkwəyəm (Musqueam) people, who for millennia have passed on their culture, history, and traditions from one generation to the next on this site.

**COURSE SCHEDULE**

Below is the tentative class schedule. It is subject to change based on the learning progress and outcomes. “Berinato” refers to the “Good Charts” Book. “V” refers to pre-recorded videos, and “RM” refers to reading materials posted on Canvas.

Week	Date	Topic	Readings/Preparation	Due
1	Jan 4	Course Introduction Effective Data Visualization Data Visualization Canvas	V: History of Data Visualization V: Visual Principle Fundamentals	
	Jan 6	Introduction to Tableau Summary Statistics in Tableau	V: Charts: Good, Bad, and Ugly V: Tableau Introduction	Assign. 1
2	Jan 11	A Closer Look at Charts Tableau Basics Practices	V: Data Types and Chart Types	
	Jan 13	Tableau Intermediate	V: Dimensions & Segmentation	Assign. 2
3	Jan 18	Spatial Data Visualization Maps in Tableau Spatial + Time Series	V: Time Series Data Visualization	
	Jan 20	Tableau Advanced Level of Details		Assign. 3
4	Jan 25	Tableau Dashboards	RM: Muddy Water Research	
	Jan 27	BigQuery Introduction	V: BigQuery Setup	Assign. 4
5	Feb 1	BigQuery Practices		
	Feb 3	Guest Lecture Course Summary		Assign. 5 (Feb 5)