

### COURSE INFORMATION

Course title:	Data Visualization	Credits:	1.5
Course code:	BAIT 518	Class location:	HA 133
Session, term, period:	2022W2	Class times:	Tue & Thu 14:00-16:00
Section(s):	001	Exam:	Feb 6 – 11, 2023
Course duration:	Jan 3- Feb 3, 2023	Pre-requisites:	n/a
Division:	Marketing & Behaviour Scien	Co-requisites:	n/a
Program:	MBA		

### INSTRUCTOR INFORMATION

Instructor:	Laurel Xiao, DBA (She, Her)	Office location:	HA 351
Email:	<a href="mailto:Laurel.xiao@sauder.ubc.ca">Laurel.xiao@sauder.ubc.ca</a>	Office hours:	T&Th 16:30 -17:00

### COURSE DESCRIPTION

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, software tutorials, and assignments. 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>
In-Class Quizzes	30%
Assignments	20%
In-Class iClikier Questions	10%
Active Engagement: Class participation*	10%
Dashboard Presentation	<u>30%</u>
Total	<u>100%</u>

\* Attendance does not equal active engagement. Attendance is necessary but not sufficient to earn these marks.

### Details of Assessments

#### In-class Online Quizzes

With the goal of providing a more active learning experience in the classroom, you will complete regular in-class online quizzes to test your understanding of the lecture content.

#### Assignments

There will be in-class/take-home assignments to test your ability to conduct data analysis and data visualization.

#### In-class iClikier Questions

During the lecture, you will be asked to answer questions using iClikier. Make sure you set up your iClikier Cloud account and click on the link to sync your account with Canvas.

#### Active Engagement: Class participation

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 are expected attend all the classes and actively participate in class discussions. Developing business professionalism means learning to listen actively, think critically, communicate effectively, and work as a positive and productive contributor – and these skills will be evaluated through your active engagement in class. To earn participation marks, you must actively engage in classes by:

- thoughtfully asking or answering questions;
- drawing connections between concepts;
- sharing relevant experiences or points of view; or
- building on (and not merely repeating) points raised by others.

Keep in mind that quality beats quantity. You should not simply speak for the sake of it; rather, look for ways to add value to everyone's learning in class. **NOTE:** Attendance does not equal oral participation; you must actively speak and contribute in classes to earn these marks. However, you must be present to participate in class activities. Please arrive on time for class and stay for the duration. Participation points will be deducted if you are late to the classes.

#### Dashboard Presentation

The final delivery of the course is a group dashboard presentation. You will be given a case, analyze the data, and create a dashboard. Each team will spend 10 minutes presenting the dashboard. Instructions on the presentation will be given in class.

## LEARNING MATERIALS

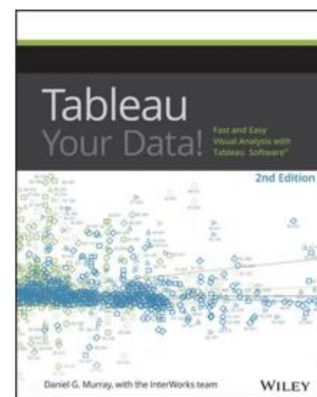
### Textbooks

The following book serves as an optional textbook for this course (highly recommend you getting a copy). 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.

The following book is recommended as a technical reference to Tableau Software (You can get free access through UBC Library).

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



### Other Required Learning Resources

- **UBC Canvas** for accessing class preparation instructions, additional readings and multimedia, online quizzes, and assignment resources.

### Software Tools

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

**Tableau:** Please install the software (Tableau Desktop) on your computer before the first day of class.

- Download URL: <https://www.tableau.com/academic>
- For more information: <https://it.ubc.ca/services/desktop-print-services/software-licensing/tableau>
- Other resources: Tableau website.

**BigQuery:** Please register an account for Google Cloud before the first day of class.

- URL: <https://cloud.google.com>.
- Other resources  
<https://cloud.google.com/bigquery/docs/introduction>  
<https://cloud.google.com/bigquery/docs/reference/standard-sql/query-syntax>

## 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. There are no make-ups for any missed in-class assignments and iClicker questions. You must attend your registered section to earn those marks. If you miss a class due to illness, please make sure to email the instructor BEFORE the class so the weight of the missed assignment can be moved to the rest assignments.

### *Group Policy*

You will be assigned a group. 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](#). 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](#).

### *Code Plagiarism*

Code plagiarism falls under the UBC policy for [Academic Misconduct](#). Students must correctly cite any code that has been authored by someone else or by the student themselves for other assignments.

Cases of "reuse" may include, but are not limited to:

- the reproduction (copying and pasting) of code with none or minimal reformatting (e.g., changing the name of the variables)
- the translation of an algorithm or a script from a language to another
- the generation of code by automatic code-generations software

An "adequate acknowledgement" requires a detailed identification of the (parts of the) code reused and a full citation of the original source code that has been reused.

Students are responsible for ensuring that any work submitted does not constitute plagiarism. Students who are in any doubt as to what constitutes plagiarism should consult their instructor before handing in any assignments.

## 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.

*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*

It is recommended that students bring their laptop to classes each day; however, 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. 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.

*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>

*Grading Policies*

**Weighting of Assignments:** The instructor reserves the right to re-weight course assignments if required. These changes are very rare and would affect all students equally. Re-weighting of course elements does not occur for individual students except in situations of extreme medical or personal emergency.

**Scaling:** Per [UBC policy](#), instructors, Faculties, departments, and schools reserve the right to scale grades in order to maintain equity among sections and conformity to University, faculty, department, or school norms. You should therefore note that an unofficial grade given by an instructor might be changed by the faculty, department, or school. **Grades in Canvas are not final and are subject to change.** Grades are not official until they appear on a student's academic record.

**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.

### *Respectfulness in the Classroom*

Students are expected to be respectful of their colleagues at all times, including faculty, staff, and peers. This means being attentive and conscious of words and actions and their impact on others, listening to people with an open mind, treating all UBC Sauder community members equally, and understanding diversity. Students who act disrespectfully toward others will be asked to leave the class and will be marked as absent for the day. They may also either be removed from a team, lose credit for in-class assessments and activities, or be asked to complete a group assignment individually.

### *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. For example, it is prohibited to: share your past assignments and answers with other students, including on websites such as Course Hero and Chegg; work with other students on an assignment when an instructor has not expressly given permission; or spread information through word of mouth, social media, websites, or other channels that subverts the fair evaluation of a class exercise, or assessment. 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 – including on websites such as Course Hero and Chegg – 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 x<sup>w</sup>məθk<sup>w</sup>əy̓əm (Musqueam) people, who for millennia have passed on their culture, history, and traditions from one generation to the next on this site.

**COURSE SCHEDULE (SUBJECT TO CHANGE AT INSTRUCTOR'S DISCRETION)**

Week	Date	Topic	Readings/Preparation
1	Jan 3 & 5	<ul style="list-style-type: none"> <li>- Course Introduction</li> <li>- Effective Data Visualization</li> <li>- Introduction to Tableau</li> </ul>	Berinato: Good Charts.. Introduction & Part One Murray: Tableau.. Ch 1
2	Jan 10 & 12	<ul style="list-style-type: none"> <li>- A Closer Look at Charts</li> <li>- Tableau Basics Practices</li> <li>- Tableau Intermediate</li> </ul>	Berinato: Good Charts.. Part Two Murray: Tableau.. Ch 3
3	Jan 17 & 19	<ul style="list-style-type: none"> <li>- Spatial Data Visualization</li> <li>- Tableau Advanced</li> <li>- Level of Details</li> </ul>	Berinato: Good Charts.. Part Three Murray: Tableau.. Ch 4 Murray: Tableau.. Ch 5
4	Jan 24 & 26	<ul style="list-style-type: none"> <li>- Tableau Dashboards</li> <li>- BigQuery Introduction</li> </ul>	Berinato: Good Charts.. Part Four Murray: Tableau.. Ch 7 GCP: <a href="https://cloud.google.com/bigquery/docs/introduction">https://cloud.google.com/bigquery/docs/introduction</a>
5	Jan 31 & Feb 2	<ul style="list-style-type: none"> <li>- BigQuery Con't</li> <li>- Course Summary</li> </ul>	Murray: Tableau.. Ch 8