COURSE INFORMATION

Course title:	**Data Visualization**		
Course code:	**BAIT 518**	Credits:	1.5
Session, term, period:	2022W1	Class location:	HA 133
Section(s):	302	Class times:	Sun 8:30am-4:00pm
Course duration:	Sept 11 & 25, Oct 16	Pre-requisites:	*(none)*
Division:	Marketing & Info Systems	Co-requisites:	*(none)*
Program:	PMBA		

INSTRUCTOR INFORMATION

Instructor:	Mark Chen		
Phone:	Contact via email	Office location:	Zoom link
Email:	mark.chen@sauder.ubc.ca	Office hours:	By appointment

Teaching assistant:	*(none)*
TA Contact:	*(none)*
TA Office hours:	*(please use Piazza discussion board and instructor's office hour for questions)*

COURSE FORMAT

- Class time will consist of in-class lectures, discussions, software demonstrations, and a small number of asynchronous pre-recorded step-by-step how-to videos
- Class discussions will be a key part of the course, where students are encouraged to leverage their diversity of past experiences to support and learn from each other
- **Due in part to its software focus, overall workload may be above average for this course.**

COURSE DESCRIPTION

The first portion of the course will explore general principles and examples of good/bad/ugly data visualization. We will categorize common business questions into four fundamental question types and discuss the best available options and tradeoffs to plot our data in order to address each question type. This portion will be software and industry agnostic, and cover concepts that should be relevant for all business environments, including hopefully yours.

The second portion of the course will involve hands-on tutorials in the use of two industry leading software: PowerBI (for data visualizations, reports, and dashboards) and PowerQuery (for data model preparations and the handling of various data sources). We will cover both tools in sufficient detail such that by the end of the course, all students should be able to:

- Independently build simple dashboards from scratch, as well as pursue advanced resources for building more complex dashboards
- Evaluate and manage the work of other dashboard creators, and to provide them with precise requirements and/or guidance for their dashboards and visualizations

LEARNING OBJECTIVES

By the end of this course, students will have a firm understanding of data visualization best practices and the ability to create effective data models and visualizations using the leading industry software products such as PowerBI and PowerQuery.

More specifically, students will:

1. **Understand the importance of data visualization in the business setting**, both as a communication and as an analytics tool
2. **Understand the key principles of visual perception and communication**, in order to select the most effective way to plot a dataset to address all type of business questions
3. **Understand the high level strengths and limitations of common industry software tools** (Excel, PowerBI, Tableau) in order to shape future company/team decisions on tool adoption
4. **Become familiar with the basics of data operations using PowerQuery**, in order to: import, join, append, and transform multiple dataset
5. **Be capable of creating an interactive report/dashboard from scratch using PowerBI** and to avoid common pitfalls in both dashboard design and rollout to users

ASSESSMENTS

Summary

Component	Weight
Class Participation & Professionalism	20%
Homework Assignments	50%
Final Assignment	30%
Total	**100%**

Details of Assessments

Homework Assignments (50%)
More details regarding each assignment will be provided when the assignments are introduced. Some assignments will need to be completed individually, while for others, debate and collaboration among peers will be encouraged. Majority of the assignments will involve creating and leveraging a data visualization in order to answer a set of business questions.

Final Assignment (30%)
More details regarding the final assignment will be provided toward the end of the course (format and delivery will partly depend on class size). The final assignment will likely involve the creation of a PowerBI dashboard in order to demonstrate the student's general understanding of, and the ability to apply, the concepts covered throughout the course.

Class Participation & Professionalism (20%)
Participation and professionalism will be assessed based on:
- Punctuality, adherence to RHL electronics lids-down rules, and general levels of engagement
- Respectful conduct towards peers, instructor, and TA, both in class and online
- Contributions to the learnings of the class through:
  - Asking high quality questions
  - Addressing peer questions in Canvas/Piazza
  - Sharing your relevant experiences from your current and past work place
  - Sharing examples of data visualization from the homework assignments

LEARNING MATERIALS
Required Textbooks: None
Reading Material: Will be posted on Canvas as the course progresses
Software Tools:
- Please download and install **PowerBI Desktop**: Download from Microsoft
  - Options for Mac users: PowerBI on a Mac?
  Please have this completed 1 week before the start of the course, so that we can troubleshoot without encroaching on your homework assignment time. Post problem to Piazza.
- *(Optional)* Sign up for **PowerBI Pro** to share and publish your dashboards as well as access to **PowerBI Services**: Free Trial
- *(Optional)* Try **Tableau** for a comparison to PowerBI: Download from Tableau

For additional background & future reference, the following resources are recommended:
- **Good Charts: The HBR Guide to […] Data Visualizations** by Scott Berinato (UBC Library, Amazon)
- **The WSJ Guide to Information Graphics** by Dona Wong (UBC Library, Amazon)
- **The Visual Display of Quantitative Information** by Edward Tufte (UBC Library, Amazon)
- **DataCamp**: Advanced PowerBI courses
- **LinkedIn Learning**: Advanced PowerBI courses

POLICIES APPLICABLE TO ALL COURSES IN THE ROBERT H. LEE GRADUATE SCHOOL
Missed or late assignments, and regrading of assessments
Late submissions will not be accepted and will receive a grade of zero.

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.
For additional background & future reference, the following resources are recommended:
- **Good Charts: The HBR Guide to […] Data Visualizations** by Scott Berinato (UBC Library, Amazon)

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.

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

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.

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ACKNOWLEDGEMENT

UBC's Point Grey Campus is located on the traditional, ancestral, and unceded territory of the xʷməθkʷəy̓əm (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 based on instructor discretion, pace of course, and/or student feedback. Majority of classes will be Synchronous (i.e. real-time, with students and instructor in-person). Asynchronous pre-recorded videos and material will mostly involve step-by-step how-to software instructions.

Class	Synchronous Or Asynchronous	Date	Topic	Readings or Activities	Assessments Due
1	S	Sept 11	• course & instructor intro • data visualization general principles • context, color, clutter, complexity • reports vs. dashboards • software overview (Excel vs. PowerBI vs. Tableau vs. others) • intro to PowerBI & PowerQuery (navigation, importing data sources, basic data prep & cleanup, plots) • [asynch.] guide for Assignment #2	TBD	**Assignment #1** *Assessing Examples of Data Visualization* **Assignment #2** *Hans Rosling's Life Expectancy vs Fertility Rate Visualization*
2	S	Sept 25	• PoweBI Part 2 (slicers vs. filters, tool tips, niche visualizations) • PowerQuery Part 2 (appending files, data types, data formats, unpivot, concatenate & de-concatenate) • class discussion on Assignment #1 • [asynch.] guide for Assignment #3	TBD	**Assignment #3** *Building an Interactive General Purpose Sales Dashboard*
3	S	Oct 16	• PowerBI Part 3 (user inputs, natural language visualization, sharing) • PowerQuery Part 3 (table joins, calculated measures, DAX intro) • dashboard rollout & change management considerations • class discussion on Assignment #3 • [asynch.] guide for Final Assignment	TBD	
4		Oct 30	*(Final Assignment deliverable and format will partly depend on class size)*		**Final Assignment**
			Additional topic if desired and time permits: • *Tableau Basics* • *Google BigQuery Basics* • *Advanced Excel (interactive dashboards using conditional formatting)*		*Please refer to Canvas and in-class announcements for Assignment due dates and requirements.*