

ITIS 5434
Data Visualization for Business Analytics
Summer 2022

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Phone: -
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Office Hours: Right after a class for quick questions/comments or by appointment

Class Meeting: Aug 12-13, 2022, 8:35 am - 5:25 pm, Nicol Building 4030

Learning Modality:

Due to the pedagogy employed, this course will be delivered in-person only. In total, attending class for this course will require approximately 16 hours in-person commitment (excluding readings, assignments and project).

Course Calendar Description:

Principles, techniques, technology and applications of data visualization for decision making; cognition and visual perception; types of visual analysis; interactive dashboards; story telling; infographics.

Course Description:

This course provides an introduction as well as hands-on experience in data visualization. It introduces students to design principles for creating meaningful displays of quantitative and qualitative data to facilitate managerial decision-making.

Course Learning Objectives:

1. Provide an overview and brief history of the practice of data visualization
2. Introduce students to the key design principles and techniques for visualizing data
3. Develop an understanding of the fundamentals of communication and alignment around concepts that are required for effective data presentation
4. Develop an introductory level of competency on Tableau and Power BI
5. Develop the skills to choose and implement appropriate charts for a variety of different scenarios and contexts
6. Allow for project-based opportunities to identify, understand, analyze, prepare, and present effective visualizations on a variety of topics
7. Ability to collect and process data, create an interactive visualization, and use it to demonstrate or provide insight into a problem, situation, or phenomenon
8. Obtain basic knowledge needed to critique various visualizations (good and bad), and to identify design principles that make good visualizations effective
9. Have a basic understanding of some of the challenges present in making data understandable across a wide range of potential audiences

Course Prerequisites: ITIS 5431 or permission of school

Recommended Books:

1. Nussbaumer Knaflic, C. (2015). *Storytelling with Data*, Wiley
<https://www.wiley.com/en-us/Storytelling+with+Data:+A+Data+Visualization+Guide+for+Business+Professionals-p-9781119002253>
2. Wexler, Shaffer and Cotgreave (2017). *The Big Book Dashboards: Visualizing Your Data Using Real-World Business Scenarios*. Wiley.
<https://www.wiley.com/en-ca/The+Big+Book+of+Dashboards%3A+Visualizing+Your+Data+Using+Real+World+Business+Scenarios-p-9781119282730>
3. *Visual Analytics with Tableau*. 2019. Alexander Loth, Nate Vogel, Sophie Sparkes
<https://www.wiley.com/en-ca/Visual+Analytics+with+Tableau-p-9781119560227#content-section>

Other Good Books:

- Cairo, A. (2019). *How Charts Lie*. W.W. Norton.
Cairo, A. (2012). *The Functional Art*. New Riders.
Cairo, A. (2016). *The Truthful Art*. New Riders.
Few, S. (2013). *Information Dashboard Design: Displaying Data for At-a-Glance Monitoring*, O’Reilly Media.
Few, S. (2004). *Show Me the Numbers: Designing Tables and Graphs to Enlighten*, Analytics Press.
Few, S. (2004). *Now You See It*, Analytics Press.
Kirk, A. (2019). *Data Visualisation: A Handbook for Data Driven Design*, Sage.
Nussbaumer Knaflic, C. (2019). *Storytelling with Data Let’s Practice*, Wiley.
Tufte, E. (2001). *The Visual Display of Quantitative Information*, Graphics Press.

Required Software: Tableau Desktop, Power BI and MS Excel

Final Exam Date: -

Drop Course Policy: The deadline for academic withdrawal is the last day of classes (each term).

Grading Scheme:

Contribution to Class Discussion	10%
In Class Exercises	15%
Tableau Assignment	25%
Final Group Project	50%
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TOTAL	100%

Each component of your grade will be assigned a percentage score. Your final course grade will be a weighted average of each of these components. Note that the grading scheme is subject to change at instructor’s discretion.

Late Assignments:

To ensure fairness for all students, penalties will be applied to late assignments: Failure to submit an assignment on time will result in an initial penalty of five (5) percentage points, followed by an additional (2) percentage points per day thereafter. For example, an assignment that would normally merit a grade of 80% would receive a grade of 75% if submitted after the deadline on the due date, 73% if submitted the following day, and so on. Requests for extension will be considered in cases of illness, family emergency, or other exceptional circumstances.

Preparation and Participation:

Class attendance is expected and is necessary to successfully complete this course. Contribution to the discussions and performing the exercises during the class are separate grading items for this course. Students are expected to submit all course deliverables as scheduled according to this course outline.

Contribution to Program Learning Goals:

MBA Learning Goal	Not Covered	Introduced	Taught but Not Assessed	Taught and Assessed
MB1 Leadership and Collaboration <i>Graduates will be equipped for leadership and collaboration.</i>				✓
MB2 Communication <i>Graduates will be effective communicators</i>				✓
MB3 Critical Thinking and Problem Solving <i>Graduates will be skilled in critical thinking and problem solving.</i>				✓
MB4 Functional Knowledge <i>Graduates will have functional knowledge of all areas of business.</i>			✓	
MB5 Global Business <i>Graduates will have an appreciation of the global environment of business.</i>	✓			
MB6 Ethical Reasoning <i>Graduates will be skilled in ethical reasoning and decision-making.</i>	✓			

COURSE SCHEDULE

Day	Topic/Agenda	Pre-class Prep
1	Course Organization	-
1	Overview of Business Analytics and Business Intelligence	-
1	Data Preparation and Data Quality	-
1	Data Visualization	-
1	Dashboards and Story Telling	-
1	Introduction to Microsoft Power BI	Power BI Installation
2	Visualization with Tableau	Tableau Installation and Activation
2	In-Class Exercises with Tableau	-
2	Current Trends in Visualization	-
2	Big Data and Cloud Computing	-
2	Course Wrap-up	-
2	Discussion on Final Group Project	-

ADDITIONAL INFORMATION

Course Sharing Websites:

Materials created for this course (including presentations and posted notes, labs, case studies, assignments and exams) remain the intellectual property of the author(s). They are intended for personal use and may not be reproduced or redistributed without prior written consent of the author(s).

Recommended Calculator for Examinations:

If you are purchasing a calculator, we recommend any one of the following options: Texas Instruments BA II Plus (including Pro Model), Hewlett Packard HP 12C (including Platinum model), Staples Financial Calculator, Sharp EL-738C & Hewlett Packard HP 10bII

Group Work:

The Sprott School of Business encourages group assignments. They provide you with opportunities to develop and enhance interpersonal, communication, leadership, followership and other group skills. Group assignments are also an effective way to learn integrative skills for putting together a complex task. Your professor may assign one or more group tasks, assignments, or projects in this course. Before embarking on a specific problem as a group, it is your responsibility to ensure that the problem is meant to be a group assignment and not an individual one.

Peer Evaluation for Group Work

To deter social loafing and ensure fairness in grading, you will be asked to assess the contribution of your fellow group members. This information will be used when assigning the grade for the final project. The procedure is as follows: Each student should take 100 points and allocate those points to the various members of the group (including him/her/themself) to reflect the contributions made by each member. For instance, if there are four members in a group and everyone contributed equally, each individual would receive 25 points. Conversely, if an individual contributed relatively little, the remaining group members might allocate few points to that member. To ensure that these peer evaluation scores are reasonable and free from personal bias, you will be asked to provide a detailed written explanation for your point allocation.

Letter Grades:

In accordance with the Carleton University Undergraduate Calendar (p. 34), the letter grades assigned in this course will have the following percentage equivalents:

A+ = 90-100	B+ = 77-79	C+ = 67-69	D+ = 57-59	F = Below 50
A = 85-89	B = 73-76	C = 63-66	D = 53-56	
A - = 80-84	B - = 70-72	C - = 60-62	D - = 50-52	

Grades entered by Registrar:

WDN = Withdrawn from the course

DEF = Deferred

Academic Regulations:

University rules regarding registration, withdrawal, appealing marks, and most anything else you might

need to know can be found on the university's website, here:

<http://calendar.carleton.ca/undergrad/regulations/academicregulationsoftheuniversity/>

Requests for Academic Accommodation:

You may need special arrangements to meet your academic obligations during the term. For an accommodation request, the processes are as follows:

- **Pregnancy**

Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, visit the Equity Services website: <https://carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf>

- **Religious Obligations**

Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, visit the Equity Services website: <https://carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf>

- **Students with Disabilities**

If you have a documented disability requiring academic accommodations in this course, please contact the Paul Menton Centre for Students with Disabilities (PMC) at 613-520-6608 or pmc@carleton.ca for a formal evaluation or contact your PMC coordinator to send your instructor your Letter of Accommodation at the beginning of the term. You must also contact the PMC no later than two weeks before the first in-class scheduled test or exam requiring accommodation (if applicable). After requesting accommodation from PMC, meet with your instructor as soon as possible to ensure accommodation arrangements are made. <https://carleton.ca/pmc/>

- **Survivors of Sexual Violence**

As a community, Carleton University is committed to maintaining a positive learning, working and living environment where sexual violence will not be tolerated, and its survivors are supported through academic accommodations as per Carleton's Sexual Violence Policy. For more information about the services available at the university and to obtain information about sexual violence and/or support, visit: <https://carleton.ca/sexual-violence-support/>

- **Student Activities**

Carleton University recognizes the substantial benefits, to both the individual student and the university, that result from participating in activities beyond the classroom experience. Reasonable accommodation will be provided to students who compete or perform at the national or international level. Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. <https://carleton.ca/senate/wp-content/uploads/Accommodation-for-Student-Activities-1.pdf>

For more information on academic accommodation, please contact the departmental administrator or visit: <https://students.carleton.ca/course-outline/>

Academic Integrity:

Violations of academic integrity—presenting another’s ideas, arguments, words or images as your own, using unauthorized material, misrepresentation, fabricating or misrepresenting research data, unauthorized co-operation or collaboration or completing work for another student—are a serious academic offence, weaken the quality of the degree, and will not be tolerated. Penalties may include; a grade of Failure on the submitted work and/or course; academic probation; a refusal of permission to continue or to register in a specific degree program; suspension from full-time studies; suspension from all studies at Carleton; expulsion from Carleton, amongst others. Students are expected to familiarize themselves with and follow the Carleton University Student Academic Integrity Policy which is available, along with resources for compliance at: <https://carleton.ca/registrar/academic-integrity/>

Centre for Student Academic Support:

The Centre for Student Academic Support (CSAS) is a centralized collection of learning support services designed to help students achieve their goals and improve their learning both inside and outside the classroom. CSAS offers academic assistance with course content, academic writing and skills development. Visit CSAS on the 4th floor of MacOdrum Library or online at: <https://carleton.ca/csas/>

Other Important Information:

- Students must always retain a hard copy of all work that is submitted.
- All final grades are subject to the Dean’s approval.
- For us to respond to your emails, we need to see your full name, CU ID, and the email must be written from your valid CARLETON address. Therefore, in order to respond to your inquiries, please send all email from your Carleton cmail account. If you do not have or have yet to activate this account, you can do so by visiting <https://carleton.ca/its/get-started/new-students-2/>