SCHOOL OF BUSINESS
Course Syllabus
(rev 2.4, 410-23)

DATA VISUALIZATION & STORYTELLING
BUAN 630 (4 Credits)

Synchronous Webex Meetings will take place
on each Monday night from 6-8:30pm,
from March 6, 2023 to April 24, 2023.

INSTRUCTOR
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CATALOG DESCRIPTION
BUAN 630 (4 Credits): Evaluates the role of descriptive analytics, both statistical measures and visualization, in delivering organizational value to decision-making contexts. Includes use of spatio-temporal data for "story-telling" and the effective communication of results to organizational decision-makers.
Prerequisites: BUAN 615 & BUAN 620.

COURSE GOAL
Visualization is an essential aspect of descriptive analytics and descriptive statistics, including spatio-temporal aspects, to support organizational decision-making. With the increasing availability of diverse data, both internal and external, and easy-to-use sophisticated analytics tools, developing business intelligence using descriptive analytics is becoming an increasingly viable option for most organizations.
This course focuses on understanding how organizational decision-makers use, and could use visualization for decision-making support in a variety of business disciplines. The focus is also on narrative using data, i.e., effective communication through visualization of results of descriptive analytics to business professionals.

COURSE LEARNING OUTCOMES

Upon successful completion of this course, students will be able to:

1. Identify organizational decision-making situations where descriptive analytics could add value
2. Identify data needs for effective visualizations for any given organizational decision-making context and justify the need for the data identified
3. Articulate design principles used for developing effective visualizations for different decision-making contexts.
4. Select the right tool(s) for effective visualizations for any decision-making context
5. Develop coherent and integrated visualizations, using appropriate tools, for any given organizational decision-making context and justify how and what value is added through the visualizations
6. Effectively communicate the insights and organizational value developed through descriptive analytics to the relevant stakeholders.

COURSE OBJECTIVES

- Articulate design principles for effective visualizations
- Develop compelling visualizations of business data
- Create effective visualization and analytical reporting using spatio-temporal data
- Justify narratives and storytelling using maps
- Articulate and communicate what value is derived from good visualizations
- Explain the difference between visuals developed/communicated (by the designer) and business intelligence received/perceived (by the recipient)
- Develop descriptive and associative measures, including spatial measures
- Identify misuse and abuse of descriptive analytics

LEARNING MATERIALS AND RESOURCES

REQUIRED TEXTS:

1. Cairo, A. (2016). *The truthful art: data, charts, and maps for communication*. Indianapolis, IN: New Riders Publishing. ISBN-13: 978-0-321-93407-9; ISBN-10: 0-321-93407-5.
2. Knaflic, Cole Nussbaumer (2019). *Storytelling with data: Let's practice*. Hoboken, NJ: Wiley. ISBN-13: 978-1119621492; ISBN-10: 1119621496.

REQUIRED READING:

Please see the article by S. Berinato in *Harvard Business Review* listed on the page that follows the course outline. A .pdf of the journal article is available from the Armacost Library.

SUGGESTED BOOKS & READINGS

1. Tufte, E. (2006). Beautiful evidence. Cheshire, CT: Graphics Press. ISBN-13: 978-9613921-7-8.

2. Tufte, E. (2001). The visual display of quantitative information. 2nd ed. Cheshire, CT: Graphics Press. ISBN-13: 978-0961392147. ISBN-10: 9780961392147.
3. Jones, G. E. (2018). How to lie with charts. Santa Monica, CA: LaPuerta. ISBN-13: 978-0996543866; ISBN-10: 0996543864.
4. Wexler, S., Shaffer, J., & A. Cotgreave (2017). The big book of Dashboards. Hoboken, NJ: Wiley. ISBN-13: 978-1119282716.

REQUIRED SOFTWARE:
(To access the software for free, see "Technology instructions.")
[1] MS Excel
[2] MS Visio:
[3] Tableau Desktop with Tableau Story
[5] ArcGIS Online
[6] ArcGIS Story Map
[7] Gapminder
[8] Prezi Basics or EDU Plus. Optional.
[9] Esri Insights.   Optional.

Asynchronous and Synchronous course delivery. The course is designed to be delivered two thirds asynchronously and one third synchronously. There will be eight weekly synchronous 2.5-hour sessions on Mondays from 6-8:30pm.

ASSIGNMENTS
Please go through the syllabus with some care. Details will be discussed and clarified during first session.

Article Report Homework sets (Individual)
For the first session of BUAN 630, each student will find an article that emphasizes a visualization applied in an organization. You will describe the organization, the problem being addressed, the visualization solution, what its impact is on employees or customers, and what are the pluses and minuses of the visualization. Identify any ethical issues that may be involved in the data and/or visualization. Please put a full APA citation of the article and any other articles or books referred to. Be sure to copy and paste and image of the visualization into your report, citing the source of the image. The article report should be 3-4 pages in length.

Lab exercises (Individual)
Seven lab exercises are assigned in each of weeks 1-7, and all are due one week later, except for Lab 7 which is due on the Sun. of the 7th week. The labs emphasize practice to visualize descriptive statistics, eliminate visual clutter, map visually, convey the ideas in maps through accompanying narration and other media ("story map" and "Tableau story"), and visualize relationships between characteristics in 2, 3, and 4 dimensions.

The software used in the lab assignments includes Excel, Visio, Tableau, Esri Insights, ArcGIS Online, Esri Story Maps, and Gapminder.
For each lab exercise, a separate handout, available on Canvas, will give more details.

Quiz
The midterm quiz in week 6 will be an essay, open-book, take-at-home exam that will be made available in week 5 on Thurs. April 14 at 8:30pm. It will be due on Sun. April 17 at midnight.
In answering the essay questions, you'll need to do some of your own thinking, analyzing, and comparing, while you will be referring to concepts from the readings.

It will cover the Cairo readings for weeks 1-6, plus articles and powerpoints.
It will not cover the Cole Nussbaumer Knaflic book or the labs. I'll write the exam so it will take, on average, 1.5 hours to complete. You can take more time if you wish.

Project (Group)
The written group project is due on Sunday of Week 8 (May 1). It counts 28 points. It will test your ability to identify a business problem (or an opportunity) in an organization for visualization. You will utilize real data that can be drawn from the Internet to develop an analytics solution that provides valuable insights for the problem. You will identify an appropriate problem from a real business/organization, specify and collect the data needed which will usually be from an Internet source but can be custom gathered, perform appropriate analyses, visualizations, storytelling, and present your findings in the form of a report. Each team consists of two students, although with an odd number of enrolled students, one team will have three students.

The report will be 8-10 pages in length, not including illustrations. It will consist of sections on description of the organization, the problem to be addressed, the data gathering process, project design steps, data analytics such as descriptive statistics, the visualization(s), what characterizes the visualization impact in terms of the five qualities in the A. Cairo textbook (chap. 2), how storytelling is achieved, and description of the pluses and minuses of the visual approach. Discuss how the visualization obtains attention and what is the planned impact of the visualization on the organization.
The visualization(s) must be created using one or more of the data visualization software packages utilized in the course. Those packages are Excel, Tableau, ArcGIS Online, Esri StoryMaps, and Gapminder. In addition, Visio can be used to enhance the data visualization with diagrams, flowcharts, storytelling charts, etc. If you use Gapminder, it is recommended not to do the entire project based on Gapminder, but to combine its visuals with visuals from one of the four other visualization packages. The reason is that Gapminder has limited number of visualization features, although it has great data.

Project Data Sources
Data sources related to a business or organizational problem depend on the topic of interest. It is recommended you work with a data source of at least 500 records and preferably over 1,000. There are many great sources of downloadable data for free. Some of you have corporate data that you have obtained authorization to use for projects (often the data are anonymized).

Below are a several public, free sources, but you can use any data source you run across, as long as you determine it is truthful and accurate.

US Census. It is a very rich source of free, high quality data on the economy, population, social and educational characteristics, technologies, agriculture, etc. If you click on "Explore Data/Explore Data Main, there is a search window that you can enter your topic of interest. It will provide lists of tables of data and maps on that topic. (A caution that the "maps" option is new and hard to use). The tables you find are downloadable in Excel (.xls) or .csv format. Those files can be read into Excel and/or into Tableau.

Tableau. Varied public datasets for Tableau are recommended by Jacob Olsufka at https://www.tableau.com/about/blog/2019/2/public-data-sets-102221
It includes data from news sites and media outlets, community-led projects, twitter data, Netflix data, and other sites for public data (Kaggle, Data.world, Data.gov, Google dataset search, and r/datasets).
Free sample data in Excel suitable for Tableau can be found at
https://www.wisdomaxis.com/technology/software/data/for-reports/
Tableau Public provides many free datasets (https://public.tableau.com/en-us/s/resources). You simply fill out a "Create a Profile" to be able to sign in.

Esri Living Atlas (https://livingatlas.arcgis.com/en/home/)
In Lab Exercise 4 on ArcGIS Online, you have already been introduced to, and accessed data from the Esri Living Atlas. The URL above has a search box, with which you can access thousands of map layers, many of which have datasets associated with them. Look for a "Feature Layer" in which the description refers to the data being available.

Business Analyst Online. This is a Esri source of up to 8,000 business and government related spatial datasets. You can access Business Analyst Online by going to School of Business Portal at www.redlandsbusiness.maps.arcgis.com and logging in with your UofR login and password. Click on the "waffle" button in the upper right, and then click on Business Analyst Online. It will bring up the software, which is a simplified version of ArcGIS Online. You can easily Add a dataset on a wide variety of business and economic topics and load it into Business Analyst Online (BAO). (Note: you can export layers from BAO that are readable into ArcGIS Online, which can give added visualization features).

Airbnb. The company is exceptional in providing extensive datasets on its rental properties at worldwide locations and over many years.
You can find the data at http://insideairbnb.com/get-the-data.html

Project presentation (Group).
The presentation counts 6 points. Students present the findings from their final project in a 10-minute presentation during the final session of the course in Week 8 on April 28. All the students in a group will need to participate in presenting. The visualization your group has created should be shown as part of the presentation. Your talk will be following by a Q&A.

An assessment rubric will be used for the project presentation to evaluate effective communication of insights and value generated by descriptive analytics developed for the project. This assessment is part of the University of Redlands School of Business continuous quality and process improvement efforts towards maintaining ACBSP accreditation.

Course Assessment and Grading
Your grade will be determined as follows:

ASSIGNMENTS	Linkage of Assignment to Course Learning Outcome(s) #	Linkage of Assignment to **MSBA Program Learning Outcome(s)[1]#**	WEIGHT	SESSION DUE
Article Report	1, 2, 6	1, 5, 6	10%	
Lab #1	2, 3, 5, 6	2, 3	4%	2
Lab #2	2, 3, 4, & 5	2, 3	4%	3
Lab #3	2, 3, 4, & 5	2, 3	4%	4
Lab #4	2, 3, 4, 5, & 6	1, 2, 3	4%	5
Lab #5	2, 3, 4, & 5	1, 2, 3	4%	6
Lab #6	2, 3, 4, 5 & 6	1, 2, 3, 6	4%	7
Lab #7	2, 3, 4, & 5	1, 2, 3, 5	4%	7
Quiz			20%	5
Participation			8%	8
Project presentation	1 though 6	1 through 6	6%	8
Project*	6	6	28%	8

TOTAL			100%	

*This assignment will be also used for assessment-of-learning purposes.

Assignments should demonstrate that students have analyzed and are thinking critically about the key issues in the course and relevant materials. Assignments should be logically presented, adequately supported, and carefully reasoned.

Grades will be assigned according to the following **Number/Letter Grading Relationship Table:**

4.0 A	95% - 100%	2.0 C	73% - 76%
3.7 A-	90% - 94%	1.7 C-	70% - 72%
3.3 B+	87% - 89%	1.3 D+	67% - 69%
3.0 B	83% - 86%	1.0 D	63% - 66%
2.7 B-	80% - 82%	0.7 D-	60% - 62%
2.3 C+	77% - 79%	0.0 F	below 60%

The following is the University of Redlands grading criteria.

3.7, 4.0   A   Outstanding
Student displayed exceptional grasp of the material, frequently with evidence of intellectual insight and original thought.

2.7, 3.0, 3.3   B   Excellent
Work demonstrated a thorough grasp of the material with occasional errors and omissions. Assignments were thoroughly and completely done, with careful attention to detail and clarity, and with evidence of intellectual insight.

For Graduate Courses Only
Credit for a course graded below 2.0 cannot be applied toward a graduate degree. See the "Graduate Grading Section" in the UR Catalog.

1.7, 2.0, 2.3 C   Acceptable
The quality of the work was acceptable, meeting minimal course standards, but not exceptional. Performance on the examinations and other assignments was satisfactory and demonstrated that the student was keeping up with the material and attending to detail.

0.7, 1.0, 1.3 D   Poor

The quality of the work was not always satisfactory, but overall was passing. Assigned work was not always done, and when done was inadequate. Performance on examinations and other work was generally weak with regard to understanding of subject, proper formulations of ideas, and thoroughness.

0   F Failing

A grade of "F" indicates that the student failed the course. The quality and quantity of work was not of college level. A failing grade may be assigned for a variety of reasons such as failure to complete course requirements as outlined in the syllabus, inability to comprehend course material or ineptitude in dealing with it, consistently unsatisfactory performance on examinations and/or assignments, or excessive absences.

Grade of "Incomplete"

An "incomplete" is not given for poor or neglected work. A grade of "incomplete" is to be granted only for very special reasons and should occur only after a discussion between faculty and student, initiated by the student. The decision of whether or not to grant an incomplete is dependent on an emergency situation that prevents the student from completing (on time) the work necessary for the course. An incomplete grade will be converted to a permanent grade within eight weeks from the last night of the course. This means that the instructor must turn in the grade to the Registrar no later than the eighth week. Any incomplete work must be submitted to the instructor with enough lead time for the instructor to evaluate the work and issue a grade change. See U of R catalog for further guidance.

Citation Styles

Faculty may choose any recognized style for the correct and consistent citation of resources and must provide students with links to books or websites that provide details concerning their preferred style. Faculty may also instruct students to use an appropriate style of their own choice. Examples of appropriate styles include American Psychological Association (APA), Chicago Manual of Style (CMS), Modern Humanities Research Association (MHRA), Modern Language Association (MLA), and Turabian.

COURSE POLICIES
1. Please attend *all* class sessions and participate in class discussions. Descriptive analytics is difficult to learn from the text only. Lectures and class discussions are an integral part of your learning experience.
2. If you have to miss a class session, check with the instructor and classmates for missed information.
3. Please try to keep up with your assignments. This is a subject that cannot be learned merely by listening to lectures. You should work through examples and get involved in discussions.

4. Please type all your weekly assignments (questions, problems, and case analysis) and present them professionally.
5. Do not duplicate copyrighted software. This is software piracy.

Time Management

Each 4-unit (Carnegie Unit) graduate course is the equivalent of 180 hours. Thus an 8-week accelerated course is equivalent to 22.5 hours per week. Four hours are spent in class each week; the course has been designed with the expectation that homework will take about 18 hours per week. Although the amount of time that you spend studying may depend upon the subject matter, a student should expect to spend an average of 18 hours each week.

Disability Services

A student with a documented disability who wishes to request an accommodation should contact the School of Business Director of Student Services at (909) 748-8743 or SBStudentServices@redlands.edu for assistance.

Title IX

The University of Redlands is committed to providing a safe learning environment for all students that is free of all forms of discrimination, sexual misconduct, and sexual harassment, including sexual assault, domestic violence, dating violence, and stalking. If you (or someone you know) has experienced or experiences any of these incidents, know that you are not alone. The University of Redlands has staff members trained to support you in navigating campus life, accessing health and counseling services, providing academic and housing accommodations, no contact orders, and more.

Please be aware all University of Redlands faculty members are "responsible employees," which means that if you tell me about a situation involving sexual harassment, sexual assault, dating violence, domestic violence, or stalking, I must share that information with the Title IX Coordinator. Although I have to make that notification, you will control how your case will be handled, including whether or not you wish to pursue a formal complaint. Our goal is to make sure you are aware of the range of options available to you and have access to the resources you need.

Title IX Coordinator or Deputy Title IX Coordinator contact information is below:
1. Title IX Coordinator, Pat Caudle, pat_caudle@redlands.edu or 909-748-8171
2. Deputy Title IX Coordinator, Erica Moorer: erica_moorer@redlands.edu or 909-748-8916

If you wish to speak to someone privately, you can contact any of the following on-campus resources:

- Chaplain's Office (http://www.redlands.edu/student-life/campus-diversity-and-inclusion/religious-diversity/, 909-748-8368

For more information please visit: www.redlands.edu/titleix

Policy for Cell Phones and Laptops in the Classroom
Cell phones will be off or on vibrate during all class sessions (excluding the dinner break). Students should refrain from making or taking non-critical personal or business cell phone calls during class sessions. If a phone call must be taken, the student will exit the classroom.

Laptop use during class is limited to taking notes related to the lecture or class discussions and/or researching material directly requested by the instructor. Internet searches will not be used to support discussions or interaction during class time unless specifically requested by the instructor. Students will not use cell phones and/or laptops to surf the web, play games, read or generate personal or business email, or text others in class or outside of class for any reason during class time.

Academic Honesty
The University of Redlands Policy on Academic Honesty will be strictly adhered to and applied. The Procedures for Addressing Academic Honesty are set forth in the University of Redlands Catalog. It is expected that all students read and understand the Policy and the provisions outlined in the Catalog.

The highest standards of academic conduct are required. This is particularly true for the proper citation of course and research material in *all* written assignments. If you did not actually collect the data or independently arrive at the idea presented, then a proper citation must be used. Citations (in the form of parenthetical notes, endnotes or footnotes) must be used for quoted or paraphrased text and any time you borrow an idea from an author, the instructor, or your peers. Using someone else's sentence or organizational structure, pattern of argument and word choice, even if not exactly similar in every respect, warrants citation. It is students' responsibility to make sure that their citations and quotation marks **unambiguously** highlight the ideas, words, sentences, and arguments that they borrow from other sources. Paraphrasing is not simply changing one or two words in a sentence; it **completely** reconstructs someone else's idea in your own words. For guidelines on appropriate citation, quotation, paraphrasing, and plagiarism, see materials provided by the Indiana University's Writing Tutorial Center at http://www.indiana.edu/~wts/pamphlets/plagiarism.shtml or by the Purdue Online Writing Lab (OWL) at https://owl.english.purdue.edu/owl/resource/560/01/

Discussion with the instructor and your peers is encouraged before the composition of written work; however, all written work, unless specified by the instructor, is to reflect independent composition and revision. Students working on group or collaborative assignments are expected to contribute equally to all tasks necessary for completion of the assignment.

Students are expected to follow all written and verbal instructions provided by the instructor with regard to written assignments, quizzes and/or exams. In addition to plagiarism, other impermissible academic behavior includes, but is not limited to, collaboration without instructor consent, falsifying research data, illicit possession of exams, using study aids during exams, unauthorized communication about an assignment or exam, handing in others' work as your own, reusing assignments or papers from other courses, and impeding equal access to educational resources by other students.

Time constraints, the demands of work and family, failing to read the University's Policy on Academic Honesty, unintentional misuse of sources, or a lack of preparation do not excuse academic dishonesty or otherwise mitigate the appropriate penalty. Penalty for a first offense is at the discretion of the instructor.

If a student is uncertain about appropriate methods of citation or has a question about the academic honesty policy, it is his or her responsibility to seek guidance from the instructor, a University official, or another reputable source.

Armacost Library Services
Any time you see the word "research" or related concepts in your syllabus or on an assignment, there is a good chance that you will be required to locate, read, and incorporate information into your coursework from someplace other than Google. The University uses part of your tuition to pay for access to a wide variety of tools and resources located beyond firewalls on the web, undiscoverable or inaccessible to the casual searcher. Please visit library.redlands.edu/business in order to browse the many resources available to you. All links requesting a login can be accessed by entering your myRedlands ID (firstname_lastname) and the same, case-sensitive password you use for all other University applications.

Feel free to use the navigation on the webpage to explore the resources provided for many other disciplinary areas you may be interested in exploring. There are descriptions of which databases contain various types of information, and pictures and demos on how to most effectively use them. If you have a question regarding the research process or gaining access to or using a source, please contact your librarian, Janelle Julagay, by email at janelle_julagay@redlands.edu or by phone at 909.748.8083

anytime. Drop-in office hours are listed on the website, and she is generally in the library at the main campus Monday-Friday during normal business hours.

Code of Student Conduct
At the time of new-student orientation, all School of Business students were directed to read the University's Code of Student Conduct on the University's website. If you need access to the Code of Student Conduct at this time, please visit the University's website.

COURSE SCHEDULE (Planned)

Day/ Date	Topic	Readings/ Videos	Lab assignment (with software listed in bold)	Deliverables
1 March 6	Introduction to course Visualization Introduction to mapping with ArcGIS Online	**Read:** TTA: Chps 1,2; LP: Ch. 1,3 Data and descriptive measures discussion in any business statistics book. **Video**. Take free online Esri "ArcGIS Online Basics" (1 hour, 50 min.)	Lab 1 on Planning for and Visualizing Descriptive Data. **MS Word** notes. LP. Exercises 1.1 through 1.6. **Excel** LP. Exercises 3.1 and 3.2.	Report on article that uses data visualization Due 3/12
2 March 13	Principles of visualization Drawing of Objects Visualizing descriptive statistics	**Read:** TTA: Ch. 5,6 LP: Ch. 2, Ch. 4 pp. 99-112. **Video**:"The elements of visualization" A. Cairo (9.6 min) "Identifying encodings" A. Cairo (14.3 min.) **Video "**Microsoft Visio 2019: Full Tutorial for Beginners.	Lab 2. Descriptive Graphs and Drawings that communicate well and have impact, **Visio, Excel**	Lab 1. Due 3/19 Assignment – Questions on the Elements of Visualization (participation)

| 3

March 20 | Visualizing distributions
Dashboards | **Read:** TTA: Ch.7,8

Videos: Tableau training, "Getting started" (34 min) "Visual analytics (1 hour) "Dashboards and stories" (40 min)
. | Lab 3. Summarizing big data, focusing attention for decision-making on graphs, maps, and dashboards
Tableau | Lab 2 Due 3/26 |
|---|---|---|---|---|
| 4

March 27 | Mapping I. Mapping to have impact | **Read:** TTA: Ch. 10.

Article: "Visualizations that Really Work," S. Berinato, HBR, 6,2018.
Storymap: "The lines that shape our cities" Esri, 2020. | Lab 4. Mapping with ArcGIS Online.
ArcGIS Online | Lab 3 Due 4/2 |
| 5

April 3 | Mapping II
Narratives and story telling | **Read: 9 Articles** LP: Ch. 6 | Lab 5. Presenting Maps with Story Maps
Esri Story Maps | Lab 4 Due 4/10 |
| 6

April 10 | Narratives and storytelling Conveying truth.
Uncertainty | **Read:** TTA: Ch. 3; Ch. 4, pp. 112-116; Ch. 11;

Article: M.-B. Moser and E.I. Moser. Where Am I, Where am I going? Sci. Am., Jan. 2016.
Video: Modern cartography and the 3D revolution, R. Hwang, June, 2017. (16.3 min.) | Lab 6. Lab Assignment based partly on LP Practice Exercises 6.8 to 6.15.   Consider ethical aspects.
Esri Story Maps, Tableau Story, Powerpoint | Lab 5 Due 4/16

Quiz on TTA, article readings, and powerpoints (available in Canvas at start of class on Mon. April 10, due on Thurs. April 13. prior to midnight) |

7 April 17	Seeing relationships in data	**Read:** TTA: Ch. 9,10; LP: Ch. 10 **Article** TBA **Video**: "The best stats you've ever seen. H. Rosling, TED talk. 6, 2007 (19.5 min.).	Lab 7. Considering relationships of nations in 2, 3, and 4 dimensions. Consider value of the visualization. **Gapminder**	Lab 6 due on Saturday evening, April 22 Lab 7 due on Sunday evening, April 23
8 April 24	Term project (Will be used for assessment purposes)	**Read: Books:** None **Audio**: "Edward Tufte wants you to see better." NPR, Jan. 18, 2013.	Project report & presentations; Must use one or more of the following: **ArcGIS Online, Esri Story Maps, Tableau, Tableau Story.** Can supplement with Excel, Visio, Esri Insights, and/or Gapminder.	Project report & presentations; Oral report by the team is given on Mon. 4/24 in class. Written team report is due on Sun. April 30 at 11:59pm.

Note: TTA refers to the textbook *The Truthful Art* (2020) by A. Cairo. **LP** refers to the book *Storytelling with Data* (2016) by C.N. Knaflic.

Note: *This schedule may be changed at any regularly scheduled class meeting depending on class requirements/progress.*

Required readings: articles

1. Berinato, S (2018). Visualizations that really work. *Harvard Business Review*, June, 92-100. Week 4.

Required and optional videos, audio, and storymaps

1. ArcGIS Online Basics (optional). Web course available at https://www.esri.com/training/catalog/5d816c0255cf937306d2d3ef/arcgis-online-basics/ Note: you need to sign on with your UoR login and password.
2. Click on Esri Training. In the search field, type in "ArcGIS Online Basics." You can click on the course button to start the Web Course (1 hour, 50 minutes). You can leave and return to this button and continue with the course until you're finished. Week 1.
3. The elements of visualization (part 2). and identifying encodings (part 3) (required)   Alberto Cairo. Knight Center Courses. May 24, 2018. Module 1 video, part 2. 9.57 minutes. Module 1 video, part 3. 14.31 minutes. Available at
    a. https://www.youtube.com/watch?v=Y_fyspMAAnw&list=PL0tDk-f4v1ugEg01UdiXB9QL0AaSSsaYs&index=3 . Week 2.
4. Visio Training video on Microsoft Visio 2019-Full Tutorial for Beginners. April 2, 2019. (required) 13.04 minutes. https://www.youtube.com/watch?v=assTdjDzBs0
5. Tableau Training videos (optional) https://www.tableau.com/learn/training/20204?build=20204.20.1106.0321&edition=pro&lang=en-us&platform=windows&version=2020.4
    a. Getting started (3 videos, 34 minutes)
    b. Visual Analytics (10 videos, 1 hour)
    c. Dashboards and stories (8 videos, 40 minutes). Week 3.
6. The lines that shape our cities: connecting present-day environmental inequalities to the redlining policies of the 1930s. (required) Storymap. (1 hour) Esri team.
    a. https://storymaps.arcgis.com/stories/0f58d49c566b486482b3e64e9e5f7ac9?adumkts=product. Week 4.
7. Modern cartography and the 3D revolution. Rachel Hwang, TEDx Penn, June 19, 2017. (required)_ 16.32 minutes. Available at https://www.youtube.com/watch?v=kJOOoLzj-W8 . Week 6.
8. The best stats you've ever seen. Hans Rosling. TED talk. https://www.youtube.com/watch?v=hVimVzgtD6w . Jan. 16, 2007. Week 7.

9. **Audio.** "Edward Tufte wants you to see better." Heard on Talk of the Nation, NPR.

https://www.npr.org/2013/01/18/169708761/edward-tufte-wants-you-to-see-better 23-minute audio. January 18, 2013.

Technology instructions

Instructors will update this, just before the start of the course, as technology requirements/platforms change over time.

Instructions for accessing the required software for the course:

MS Excel:
We are assuming that you have Excel available in your personal laptops/desktops/tablets, and on most machines available at work.
Excel is available in the Apporto Virtual Lab at UoR. Login at https://uredlands.apporto.com using University of Redlands e-mail and password.
Also it is available on in the university physical computer labs, once they re-open.

MS Visio:
The software is available in the Apporto Virtual Lab at UoR. Login at https://uredlands.apporto.com using University of Redlands e-mail and password. The software is also available by downloading the free one-month trial version for students.
See: https://student-version.com/microsoft-visio-students/

Tableau Desktop:
You can obtain a free single-user license of Tableau Desktop for students at https://www.tableau.com/academic/students. The software is also available in the Apporto Virtual Lab at UoR. Login at https://uredlands.apporto.com using University of Redlands e-mail and password.

ArcGIS Online
You can obtain free access to it. Login at http://redlandsbusiness.maps.arcgis.com/home/index.html using University of Redlands e-mail and password.

ArcGIS Story Maps:
Login at http://redlandsbusiness.maps.arcgis.com/home/index.html using University of Redlands e-mail and password.

Gapminder:
Login free at www.gapminder.com

Prezi (optional):
Login free for student use Basic Prezi at www.prezi.com for up to 5 projects. The EDU Plus version at student rate of 3$/month offers unlimited projects.

Esri Insights (optional)

You can receive free access to it. Login at http://redlandsbusiness.maps.arcgis.com/home/index.html using University of Redlands e-mail and password.

<p style="text-align:center; color:red">MSBA Program Learning Outcomes</p>

<p style="text-align:center; color:red">Upon completion of the MSBA Program, graduates will be able to:</p>

Application of Business Analytics Knowledge
1. Formulate and scope organizational problems by applying the principles of business, analytics, and information systems.
2. Use appropriate data and analytical methods to improve decision-making throughout an organization's value chain.

Communication, Leadership and Teamwork Skills
3. Effectively communicate/articulate the value and outcomes of business analytics to diverse audiences using written, oral, and analytical expression.
4. Effectively manage and lead teams engaged in analytics projects within the organization.

Analytics Strategy and Implications
5. Appraise analytical maturity of the organization in terms of its focus, culture, people, and technology.
6. Evaluate ethical, legal, and locational implications of data and decisions for stakeholders, internal and external to the organization.