Course Overview:

This course introduces students to the principles of data communication with a particular focus on how understanding and practicing visual communication aids in our ability communicate complex information. Working both graphically and textually, students will refine their writing and presentation skills for professional contexts through the iterative design of visuals, including data displays, slide decks and power points, interactive visual displays and written genres like reports and white papers. This project-based course engages students in application and practice that directly applies to their experience as professionals in both academic and industry contexts.

Corequisite: EAS 360 and (approved SEAS major or permission of the department)

Class times and location: Lecture - Tuesdays & Thursdays, 12:45pm-2pm, via Zoom. ***Please note that in EAS346 is a synchronous online course, meaning you are expected to be present for all class meetings. Classes will be recorded and uploaded for those in non-U.S. time zones.***

Zoom Class Meetings:

Join Zoom Meeting
https://buffalo.zoom.us/j/97199699323?pwd=em5LbmpWQmkvUEl4RkZmWE81WEtVZz09

Meeting ID: 971 9969 9323

Password: 899371

Class Objectives:

In this course you can expect to:

- Learn and implement best practices in visual communication.
- Understand the ways visual communication simplifies and communicates complex knowledge.
- Understand on be able to enact different data storytelling roles (data analyst, scripter, editor, presenter, etc.)
- Research and understand the conventions of data displays in your discipline or local learning contexts.
- Develop professional understanding of presentations formats (static, interactive, live audience, etc.) that employ visual communication.
- Identify ethical best practices in visual communication.
- Become a more effective writer (or linguistic designer).

You will meet these goals through:
- Frequent practice designing data displays and visual arguments.
- Engaging in iterative design practices.
- Conducting research with/about users and through artifacts.

By the end of this course, you will have:
- An ability to research and practice the conventions of data visualization/displays in real world contexts.
- An ability to learn and implement best practices in data visualization and visual communication across a number of mediums.
- An ability to communicate ethically and effectively about data in oral, written, and multimedia format.

Required Texts and Software*:*

Note all required texts will be made available by the professor. There is no required book or books for this course. We will read a selection of chapters from different books and a few articles for the course. Chapters and articles will be made available on the UB Learns page for the course.

Wicked, H. (2016). ggplot2: Elegant Graphics for Data Analysis. Chapter 4: Mastering the Grammar, pp 77-87.

Knaflic, C. N. (2015). Storytelling with data: A data visualization guide for business professionals. Chapter 6: dissecting model visuals, pp 140-150.

Duarte, N. (2008). Slide:ology The Art and Science of Creating Great Presentations
Ch 6: Arranging Elements & Chapter 7: Using Visual Elements Background, Color, and Text (pp 92-155).

Few, S. (2013). Information Dashboard Design. Chapter 1: Clarifying the Vision, pp. 1-33.

Pirolli, P. & Card, S. (2006). The Sensemaking Process and Leverage Points for Analyst Technology as Identified Through Cognitive Task Analysis.

All required software is open source for this class.

R Statistical Package: https://cran.r-project.org/

RStudio (IDE for R): https://rstudio.com/products/rstudio/download/#download

R Packages (we will have instructions on installing these throughout the course): ggplot2, rmarkdown & Shiny.

How You'll Be Graded & What You'll be Graded On

Effective design and visual communication skills are primarily gained through practice. As such, you will engage both with practice assignments, which ask you to practice visualization and design skills, and with polished deliverables, which ask you to create finalized projects that could be used in a portfolio, for publication, and in presentations.

Assignment	Points	Due Date
Practice Activities	40	Varied
Quiz 1	10	Feb 18
Project 1 – Data Viz Story	30	Mar 11
Quiz 2	10	Mar 23
Project 2 – Data Viz Research & Redesign	50	Apr 8
Quiz 3	10	Apr 22
Project 3 – Data Viz Presentation or Dashboard	50	Finals Week
Total Points	**200**	

Data Visualization Practice Activities 40 points (20%)
You will practice a transforming your data into visualizations through a series of an increasingly more complex approaches. You will start to develop writing and argumentation skills along with practicing visualization skills. Covers Activities 1-4.

Project 1: Data Visualization Story 40 points (15 %)
Building on the your practice with the practice activities, you will develop a data visualization and accompanying written argument. Depending on the data you use or collect in your visualization, these arguments may look very different, but you will be graded on your ability to identify and explain the ways you've engaged visual communication skills.

Project 2: Data Visualization Research, Design, and Redesign (25%)
This project is a written report of data displays used in your discipline (area of study), community, or local organization. The project has three main components:
- 500-750 word research report on data displays in your discipline, community, or a local organization, and the report should reference the next two pieces:
- Critical analysis of a data visualization, wherein you dissect and deeply analyze a data visualization used in your research site.
- Redesign of a Data Display, wherein you redesign that data display using data visualization
  best practices learned in class.

Project 3: Data Visualization Presentation or Interactive Visualization Dashboard (25%)
This project has two major tracks (you may choose either one):
- A presentation that incorporates multiple data visualizations, connected through a clear presentation structure with context, an argument and implications or takeaway points from the presentation.

- An interactive data visualization dashboard that opens the 'black box' of data, clearly laying out the context of the data, use of the interactive tool and supporting user learning (i.e., their takeaway points).

Quizzes (15%)
Quiz 1: Data Visualization Basics and Principles
Quiz 2: Understanding and Supporting Users
Quiz 3: Presenting Data Visualizations

Practice activities will be graded using a check, check plus, check minus scale. Each major project will have a rubric with criteria. Each rubric will be reviewed in class and returned with the graded assignment. Activities that involve writing will also include comments on the submission.

Final Grades:

Grade	Quality Points	Percentage
A	4.0	93.0% -100.00%
A-	3.67	90.0% - 92.9%
B+	3.33	87.0% - 89.9%
B	3.00	83.0% - 86.9%
B-	2.67	80.0% - 82.9%
C+	2.33	77.0% - 79.9%
C	2.00	73.0% - 76.9%
C-	1.67	70.0% - 72.9%
D+	1.33	67.0% - 69.9%
D	1.00	60.0% - 66.9%
F	0	59.9 or below

Incompletes (I): A grade of incomplete ("I") indicates that additional course work is required to fulfill the requirements of a given course. Students may only be given an "I" grade if they have a passing average in coursework that has been completed and have well-defined parameters to complete the course requirements that could result in a grade better than the default grade. An "I" grade may not be assigned to a student who did not attend the course. Prior to the end of the semester, students must initiate the request for an "I" grade and receive the instructor's approval. Assignment of an "I" grade is at the discretion of the instructor. For more information on "I" grade see the catalog explanation here:
https://catalog.buffalo.edu/policies/explanation.html

Policies and Procedures

Late Arrivals. Try not to be late to class. If you are late, please join quietly and hold questions about class until an appropriate time. Then, inquire from a colleague about what you missed.

Late Work. All late projects or activities will receive a one full letter grade penalty for every day it is late unless prior permission was given for late submission.

Technology requirements. A part of working in the digital age is being able to work effectively with technologies. You will be expected to check your email at least once a day. All documents submitted electronically should be saved YOURLASTNAME_ASSIGNMENTNAME. You can add, as needed, additional elements to this structure (v4, for example, or the date). The first assignment without this naming structure will receive a warning, the second a 25% deduction in grade, the third a 50% deduction in grade, etc. Proper and consistent naming of files is a project management skill that is both necessary for effective organization and for sharing your work with colleagues, managers, and clients. No manager wants a report that reads: REPORT.docx or HERMAN.docx. Begin from the first day to save documents for yourself in a way that is organized and thoughtful.

Technology fails. Prepare for technology malfunctions by saving multiple versions (at least one in the cloud somewhere) and by backing up all documents. Carry a flash drive with you.

Academic Integrity. Academic integrity is a fundamental university value. Through the honest completion of academic work, students sustain the integrity of the university while facilitating the university's imperative for the transmission of knowledge and culture based upon the generation of new and innovative ideas. See the link for more details:
 https://catalog.buffalo.edu/policies/integrity.html

Accommodations. I invite you to contact me during the first two weeks of class to discuss your any special needs or accommodations, if any, under the Americans with Disabilities Act. Explore services and responsibilities for students with special needs at Student Disability Services:

Accessibility Resources
60 Capen Hall
716-645-2608