
TEACHING NEWS DESIGN AND DATA VISUALIZATION

Rebecca K. Britt, University of Alabama

INTRODUCTORY ESSAY

News Design and Data Visualization is a three-hour, upper level undergraduate course that addresses the role of data in delivering information to the public, informed by the visual practice of design and writing. For students who study journalism, it is crucial for them to have skills that reflect current industry practices. The course, part of the news editing sequence in the department, reflects an emphasis on the use of data to improve students' understanding to use and develop basic literacy skills with data sets. Additionally, it helps develop students' skills with mapping information (such as maps and graphs) in an aesthetically pleasing manner, as professionals in the field have asked our students to develop these skills as they enter relevant careers in communication and journalism-based industries. The course meets once per week, combining lecture and lab as per departmental requirements, and has approximately 15 students enrolled.

SKILLS AND CHALLENGES ASSOCIATED WITH THIS COURSE

Students who enter this class must have successfully completed two other courses: Visual Journalism and News Writing and Reporting. Those courses prepared students for skills such as basic news writing and reporting, an understanding of how the industry operates, and skills in writing proficiency. Likewise, students will have come prepared to this class with experience in visual design. As a result, while this course involves writing and design components, the amount of instruction necessary is less due to these prerequisites. Similarly, because there is both lecture and a lab component to this class, we have time dedicated to discussing and actively practicing the principles students learn in class. As such, I often ask students to carefully consider the choices they make for their assignments, and have time to work with them, given the smaller size of the class. However, that may not be possible in larger courses. For instructors who wish to adapt this syllabus, they may want to consider the skill level and prerequisites that are required of students.

A challenge with this class is that some students have varied experience in data analysis, though most understand the importance of data journalism (Treadwell et al., 2016) in a changing industry. While many have fundamentals of data analysis, not all share these experiences. To overcome this challenge, I provide students with in-lab exercises, resources and data sets that we work with collectively early in the semester (e.g., via GitHub and Kaggle), and practice cleaning data sets and with SPSS. It should be noted that the advantages to working with repository services like GitHub is that they are readily accessible and offer available code, geospatial data, and public data sets, with some directly developed via the organizations themselves towards students (e.g., GitHub Student Developer Program, 2018). Likewise, Kaggle is among the largest online data repositories for data science, with both sites being well-received by students.

Students have the option of working with other repositories as well (e.g., World Bank) to pair their data sets with news stories that they develop over the course of the semester. Notably, while the use of publicly accessible data sets comes with its own challenges, students learn about the best practices associated with selecting appropriate data sets and how to discern quality resources for their use. Throughout the use of these exercises, and work with these data sets, examples of practices of data journalism are given, be it those that apply to local practices within the community, or those on a broader scope (e.g. Krause, 2016, on the growing role of data journalism in *Nature*).

A second challenge to the class has been pairing the aforementioned role of data journalism with photo editing and layout principles, which are also required components of the course. To connect these principles in a meaningful way, students develop narratives to tell their stories using data journalism and combine these techniques with the importance of visual communication. Data journalism can help journalists tell complex stories in an engaging manner, often with visual graphics and text, and as such, it is important for students to learn what appeals their audience (Anderson, 2016; Gupta et al., 2016; Pentzold, Brantner, & Folsche, 2018). Students have responded well to this, and in the news stories they produce later in the units (see Unit 2, for instance), they have brought information from their previous exercises in the class to connect these very points. In some cases, students have built projects that they have shared on their personal web sites as exemplary work.

The following syllabus has been delivered to sections of the News Design and Data Visualization class. The goals of the class are, in brief, to help students develop basic competency in data visualization principles and working with data sets to be able to analyze relevant content. Subsequently, students must be able to creatively write news stories that pair data journalism with principles of design. This helps students as they construct broader narratives to deliver to an audience as they consider the rhetorical choices they make. Exercises, projects, and other details are outlined below. In my instruction of the course, I seek to foster a learning environment where students see how their ideas and practice with data journalism comes to fruition as they develop projects that are both newsworthy, well designed, and thoughtful.

COURSE STRUCTURE

In News Design and Data Visualization, the class meets once per week for three hours, which includes a combined lecture and lab. As mentioned, the class is capped at 15 students. The class meets in a lab equipped with iMacs. There are two textbooks assigned. One is *Data + Design*, an online textbook; the second is *The Design of Everyday Things*, an affordable, mass paperback book by Don Norman. The two books have worked in tandem; *Data + Design* reviews practices of analyzing data in the context of visualizing information, and *The Design of Everyday Things* is a practical book that outlines usable design practices, which has led our class to reflective conversations.

The class is split into three units, including 1) data visualization, 2) photo visualization, and 3) an integrated final project that brings together data visualization and design. Over the course of the semester, students complete exercises and projects. The first half of class periods is spent in a lecture-discussion format, where students discuss readings and participate in activities relating to our readings. We then take a brief break and transition to lab time, where I provide demonstrations and students work hands-on with software, data sets, Adobe CC, and so forth, to apply the principles they've learned as they work.

REFERENCES

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SYLLABUS: TEACHING NEWS DESIGN AND DATA VISUALIZATION

COURSE DESCRIPTION:

This class will familiarize students with basic data visualization and design principles as a method to communicate news stories. Students will learn to apply basic visual analytics in a journalistic context and relate those to design principles, such as color, balance, proximity, mapping, while practicing design skills. Students will consider the rhetorical choices they make in their data visualization, design practices, the news stories they write, the reflections they turn in, and the conversations held in class. Students will work with data sets to understand a range of the ways that data journalism can be useful in the professional world, and they will have gained experience producing and thinking about visual content and the choices they make in a creative manner. Finally, students will build projects that can serve them in their future classes and careers.

STUDENT GOALS:

By the end of the semester, students should gain:

- Skills in basic analytics and how those are applied to effective data visualization in a journalistic context. This will be assessed through exercises in the course and a major data visualization project.

- The ability to build data visualizations, photographs, and layout design through news stories developed during the semester.
- Portfolio pieces that can be presented to a potential employer. This should be evident in each project developed in the course.

REQUIRED TEXTS:

Please purchase the following text:

Norman, D. (2014). *The design of everyday things*, Revised and Expanded Edition. MIT Press.

The following text is required and is available online:

Infoactive.co (2018). Data + Design: A simple introduction to preparing and visualizing information. <https://infoactive.co/data-design>

All other readings will be distributed on Blackboard by your professor.

INSTRUCTIONAL METHODS:

This course includes both lecture and computer lab material, including hands-on exercises in lab, independent projects, and a service learning project.

GRADES AND COURSE ASSIGNMENTS:

Grades will be based on:

Data Visualization Project	15%
Photo Visualization Project	15%
Final Project	30%
Six Exercises	30%
Participation	5%
Attendance	5%

ASSIGNMENT DESCRIPTIONS

All projects should be designed to help build your professional portfolio and help make you competitive for the job market. I encourage you to pursue topics for these projects that are personally and professionally interesting to you. Please do not hesitate to come to me at any time, during lab time, office hours, or via email if you have questions. I am very happy to help you with your projects to ensure you have strong portfolio pieces that you can use as you prepare for your careers.

UNIT 1 DATA VISUALIZATION PROJECT

For this project, you will work with a data set and create a visualization using Adobe CC to illustrate the pragmatism of data journalism. This can be based on any number of topics and should be designed with a particular audience in mind. Consider, for instance, building an infographic or interactive PDF that takes a topic of public interest (e.g., the average costs of college for students in the state by school; the most popular fast food chains in 2018, and so forth). You have example data sets on Blackboard and links to resources (such as GitHub, Kaggle, and access to the Public Opinion Lab here at the university for data collection). You are visualizing information that is simple and clear.

UNIT 2 PHOTO VISUALIZATION PROJECT

In Unit 2, you are pairing photo editing with storytelling to provide a narrative. Use photo editing principles and draw upon the simple visualization techniques learned from Unit 1 to design a clean graphic that uses photos combined with a narrative—be it an interview, a news story, a writing prompt, or other creative approach, to design a graphic that integrates this content in a meaningful way. Students often take the topic they used in Unit 1 to bring into this second unit. You can, and are encouraged, to work with the data set you used as part of Unit 1 to help build a narrative. Please note that you are taking your own photographs for Unit 2, editing them, and writing that brief, so all work needs to be your own. I encourage you to turn in drafts of your work to me so that I can give you feedback and help you develop work that is helpful for your professional portfolio.

FINAL PROJECT

The final project is an integrated project that shows the knowledge you have gained, bringing together principles of storytelling, data visualization and photo editing to create a comprehensive project that you can use as a portfolio piece. For this project, you have the option of creating a web page, infographic, poster, postcard, social media page, or other media to build in principles of data visualization, photo editing, and writing to build a creative layout. In the past, students have conducted data analytics to analyze their audience to assist with building creative content. Other times, they create multiple graphics on a single topic that combine all three to tell a narrative in several ways. The choice is yours. You will submit your final project on Blackboard.

EXERCISES

You will complete 6 assignments over the course of the semester. You will have lab time to work on exercises, which is helpful for any questions that you have. Each exercise corresponds to the unit we are actively working in and should assist you as you work on the larger projects for Units 1, 2, and the Final Project, respectively. Individual rubrics are provided for each project along with specific examples on Blackboard. Brief descriptions of each exercise are provided below.

EXERCISE 1: DATA BASICS

This first exercise requires you to become familiar with accessing, using, analyzing, and visualizing data. You will work with a sample dataset from Blackboard, and in a brief one-page, single spaced write-up, build one table or image that shows the results of running descriptive statistics on the variables outlined in the examples given. As you work, address the questions: Who produced this dataset? What is the intent of this dataset? Is the data from a reputable source, and how do you know? How recent is the dataset? Is the data comprehensive? Is it missing information? Is the data locally sourced or is it sampled from a global population? Are there errors in the dataset or uncertainties that you came across?

EXERCISE 2: MAPPING

The second exercise requires you to represent data via maps, which are widely used to display information on a variety of topics. For instance, you might explore trends in weather, to budgets per area in a given country, among others, and display that information in a visually pleasing manner along with appropriate information that explains the importance of this map. This helps to explain two things: first, why the information you gathered is worthy of a visual map, is clear and legible. Second, that the text you write clearly conveys the context of your map. As such, your task is to create a simple map and export that file, then turn it in. Provide a brief paragraph explaining the data and tool you chose and your approach to mapping; reflect on both Norman and the Data + Design readings.

EXERCISE 3: GRAPHS

In this exercise, your goal is to create an effective graph based on the data you find. The task itself is simple, yet selecting the appropriate graph should be a very thoughtful process. For instance, if you are trying to show the composition of something (you might consider political unrest depicted by demographics; brands of cosmetics that earned cruelty-free status in 2018, and so on), you would create a pie chart, stacked bar, column, or waterfall. But if you were looking at the distribution of a product, you would use a scatter plot, line or bar chart. Carefully think about these considerations as you create your graph, based on our class discussions and lab time. The graph should be aesthetically pleasing, and you should consider the newsworthiness of any visual material and how it might be used in a greater context. These are just two examples—there are many others. Select one piece of data that is meaningful and build a graph that is aesthetically pleasing and uses the right type of graph to correspond to it. Turn in a brief reflection that explains the rhetorical choices you made associated with your graph and the data you worked with, and how this assists a narrative that is ultimately constructed.

EXERCISE 4: PHOTO EDITING AND VISUALIZATION

In this exercise, your task is to take 1-2 photos and edit them using Adobe Photoshop. You'll want to edit for items such as: red eye, appropriate cropping, blurriness, contrast, saturation, and other concepts that we review in class. Be sure to turn in both your raw photo and edited photo on Blackboard. It's often helpful to learn more about the decision behind your selection process. You may refer back to your projects that use data visualization as a topical selection and consider what images would supplement the choices about the data that would help tell a more cohesive narrative. Please turn in a reflection behind the selection process/concept behind the photo(s) used in your assignment. Explain the choices you made, why you made them, and how this editing process, paired with data visualization, helps to tell a cohesive narrative that can appeal to a wide audience today.

EXERCISE 5: CUTOUTS

In this exercise, you'll build from working in Adobe Photoshop from the last project by creating a photo cutout. You may use the photo(s) you worked with in the previous assignment or use entirely new images. Select a figure or portion of the image, and cutout the portion of the image to ensure you have removed the background. In class, we will work through this using several tools, as well as review when you should use a transparent versus solid background. Time will be provided in lab to work on photo cutouts. Depending on whether you choose to create a transparent PNG file or solid JPG, ensure that you have selected the right format for your image when you upload the file to Blackboard. Ensure you have also turned in the raw image. Write a brief reflection on the process and explain the choices you have made. For instance, we viewed several examples of vastly different cutouts in class with many different

approaches—each with a unique narrative associated with them. Consider, for instance, infographics, which commonly use cutouts paired with data visualization to tell a story you're your own designs, what choices did you make, and why?

EXERCISE 6: LAYOUTS AND DATA VISUALIZATION

The final exercise in class culminates the work you have done in previous exercises and considers the role of data visualization and analytics. In this exercise, you will build a layout in Adobe InDesign, and you are welcome to create elements for that layout in Illustrator or Photoshop. Ensure that you've considered the role of how visual analytics plays a part in this layout as you would insert text (e.g., perhaps the content from Unit 2) and what storytelling process data visualization would play in this layout. What practices would be helpful in this layout, and why? What choices have you made to ensure that the data shared in a layout like this would be meaningful? Refer back to your charts as examples and build a layout that could be used for a brochure, newsletter, web site, infographic, or other presentation/article of your choice. The layout can have mockup content within it or be clear but should demonstrate your ability to put together content in a meaningful way. Be sure to turn in both a raw .indd file and a .PDF file. See examples on Blackboard for reference.

PARTICIPATION

Each week, students will come prepared with a one page discussion preparation assignment. Please bring notes on the readings for the week with a summary of your thoughts, any questions, and takeaways. The format is up to you; bullet points are perfectly acceptable. This allows you to bring any questions or ideas to the class for discussion and help build an engaged classroom environment where all of us have a space to communicate.

GRADING CRITERIA

As an overview, all rubrics in the course generally include the following criteria under which they are graded: **Attention to Prompt, Content, Visuals, Organization and Structure, and Writing style and Grammar**. Pay close attention to each of these criteria and review each individual rubric as they are described on Blackboard.

COURSE POLICIES:

ETIQUETTE

This is an active learning environment. Please come to class with the following:

- *Read course materials.* All members of the class should come to class having read the materials for that day. Participation is difficult when class members have not read, and therefore contributes to a less successful classroom. You are responsible for reading the syllabus and knowing what readings to have read for a given week. If you ever have questions about a reading or materials for a given week, please do not hesitate to ask.
- *Please be prepared to ask and answer questions in class.* Many questions will be posed in class, which ask you to reflect on the readings, the exercises or projects you're working on, or a combination of them. Be prepared to talk about these experiences, ask questions yourself, and

answer questions in a reflective manner.

- *Class decorum.* During class, please turn your cell phones on silent, arrive on time, do not text during class, and be mindful of each other and your professor. We want to work together to build a classroom environment that is conducive to learning. We must be considerate of each other. Consider your behaviors in the classroom. Regarding potentially disruptive behaviors, a good way to think about these is this: If it's a behavior you would not conduct in a professional workplace environment, please do not engage in that here.

ATTENDANCE

We meet once per week in this course, meaning that if you miss one period, you'll miss the entire week. This means that attendance is crucial to understanding the materials in this course. The materials build off each week, so missing class will inhibit your chances to ask questions and actively get to know your classmates, along with building your knowledge. To that end, I do expect you to arrive to class on time. You are granted one unexcused absence. *Afterwards, the penalty is 5 percentage points per missed class.*

You will not be penalized for missing classes for medically documented reasons or personal emergencies, for religious holidays or other emergencies. Please email me in advance so that alternative arrangements can be made to complete any class work.

LATE WORK

Late work is not accepted except in extreme unforeseen circumstances. As this is a journalism class, if you were in the newsroom, if you turned in a story late, it would not be accepted there. The same holds true here. Assignments are always due to Blackboard at their given time and you have plenty of time to work on course projects. All project rubrics are up at the start of the semester, so you have all available materials to you. There should be no questions about when an assignment is due.

ADDITIONAL POLICIES:

SPECIAL CIRCUMSTANCES

No list of policies can account for every situation that may arise during the semester. I encourage you to speak to me if you have a question about a situation that you need to discuss. Please feel free to come to me during my office hours, or if I am in my office and you see my door open. If you cannot make my office hours, please make an appointment to see me.

PLAGARISM/SELF-PLAGARISM

All writing compositions turned in must be original work. To copy text or ideas from another source (including your own previously, or concurrently, submitted course work) without appropriate reference is plagiarism and will result in a failing grade for your assignment and possibly further disciplinary action.

ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES

If you need an accommodation based on a disability, please contact the Office of Disability Services. They will provide you with the accommodations that will be used in the classroom. Once you have verified your accommodation with their office, I will review the course requirements with you and ensure your requested accommodations are met.

ABOUT YOUR INSTRUCTOR

I enjoy data visualization and applying it to designing creative health campaigns. How can we promote important health information to the public using memorable visuals and narratives? The information we gain from data tells a story, and that story can make a difference in our lives. When I am not working on health campaign research, I enjoy video games and art.

COURSE SCHEDULE:

Please note: the class schedule is subject to change. Students are responsible for regularly checking the schedule.

Week/Dates	Class Topic	Assignment/Lab
Week 1	Course overview, principles and theories outlined in News Design and Data Visualization	Overview of necessary course materials Lab time to practice with datasets
Week 2	Introduction to data visualization Data and design Finding and researching datasets	Data + Design Readings: Chapter 1 (Basic Types), Chapter 2 (Data Aggregation), Chapter 7 (Data Preparation), Chapter 8 (Data Cleaning)
Week 3	Mapping in news design Human centered design; how design principles and data relate to journalistic practices today	Data Basics Exercise #1 Due Norman Chapter 1 (Focus on mapping, affordances, human-centered design) Data + Design Chapter 12
Week 4	Principles of Design Discussion of good vs. bad design Graphs in news and data visualization Introduction to Project 1 (Data Visualization)	Mapping Exercise #2 Due (Blackboard) Norman Chapter 5 (Focus on 'Designing for Error,' 'When Good Design Isn't Enough')

Week 5	Reviewing color, font, icons, designing for print vs. web Review of Project 1	Graphs Exercise #3 Due Data + Design, Chapter 14 (Anatomy of a Graphic), Chapter 15 (Importance of Color, Font, Icons), Chapter 16 (Print vs. Web)
Week 6	Project 1 work time; bring drafts and questions, review prior chapters for your respective work	Bring project drafts to class for review and critique
Week 7	Photo principles Ethical considerations in visual journalism	Project 1 Due Resources on Blackboard in "Project 2" folder titled 'News Values'- contains links to SPJ Code of Ethics, Creative Commons, National Press Photographers Association—Read for understanding and fair use
Week 8	Photo editing, narratives and news design practices Project 2 Reviewed	Work on Exercise 4 in class (Refer to Data + Design Ch. 16 and be cognizant of color and design for print vs. web)
Week 9	Photo cutouts	Photo Editing Exercise #4 Due
Week 10	Conceptualizing data visualization with best design practices and design affordances	Photo Cutouts Exercise #5 Due Norman Chapter 7
Week 11	Lab time to work on Project 2; bring drafts and questions, reference chapters 12, 16 and 18 for projects	Project 2 Due Data + Design Chapter 12 (Deciding how much to illustrate), reference Chapter 16, Chapter 18 (Common Visualization Mistakes)
Week 12	Blending data visualization with layout principles	Work on Exercise 6
Week 13	Discussion of 'Design Thinking' Lab time to work on final project	Layout Exercise #6 Due Norman Chapter 6 (Design Thinking)
Week 14	Review of design thinking and connections to data visualization practices	
Week 15	Finalize Project 3	Read Data + Design Ch.18

	Discussion of blending foundations of data and design as the cornerstones of the future of journalism	Work on Project 3
Week 16		Final Project presented and delivered in class