

# VISUALIZING SCIENCE | ZOO 5890-4

Autumn 2018 | Wednesdays, 9:00-10:50 AM | 2 credits | S/U assessment\*

BC 227 (2nd floor conference room, Berry Conservation Center)

Office hours: To be determined in consultation with the class and by appointment

Instructor contact info: Bethann Garramon Merkle, MFA | bmerkle@uwyo.edu | BioSciences 16

Graduate students in this studio-style course will focus on communicating about science in visual formats, with emphasis on non-specialist audiences. Figures developed in this course will also be useful for academic outlets.

## Welcome!

I am excited to embark on this journey of thinking and communication with you! This course is predicated upon a widely held (though not unanimous) interpretation of the social contract scientists have with society – that is, that we as scientists have an obligation to engage with (not just talk at) those beyond our discipline. This won't be your typical academic experience. While you will do research, present ideas, and think carefully about how an audience will respond, you won't write standard academic research papers, and you won't be writing just to your course instructors.

Instead, ZOO 5890-4 will give you first-hand experience communicating science inside and outside your discipline. Collaboration and engagement through visual, written, and oral communication is how we learn about, connect with, and inform change in, the world. Whether or not your ultimate goals are to work in an academics, or even research, engaging people inside and outside of your field, and listening to people inside and outside of your field, is critical to professional and civic success.

And so, in ZOO 5890-4 you will continuously create, interpret, and share your writing, research, and thinking about how your science impacts what we think, what we do, and how we do it. Throughout the course, you will push the boundaries of your creativity and critical thinking; assets for any professional, any citizen. In order to do so, this course, including affiliated online spaces, supports an inclusive environment that respects the dignity of every person regardless of faith, heritage, sexual orientation or other expression of human identity and difference. In this learning community, we will welcome discourse and intellectual critique but reject harassment in all of its forms.

This course will operate like an art studio course or a writing workshop, in that most of our time in class will be spent creating and discussing our work. This might not be the easiest class you've ever been in. But that's okay. Authentic learning requires that we take risks, make mistakes, and learn from our experiences. Learning also requires flexibility, repetition, and exploration on our way to mastering skills and knowledge. In this class, we will all strive to contribute to a positive and productive learning environment for one another. This includes respecting and actively engaging with the people, ideas, topics, and issues in our course.

I really can't wait to get started! Thank for collaborating as we all together use ZOO 5890-4 to innovative and empower each other to enhance our science communication and engagement skills!

*Bethann*

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## **INCLUSIVE LEARNING COMMUNITY STATEMENT**

To reiterate, this course, including affiliated online spaces, supports an inclusive environment that respects the dignity of every person regardless of faith, heritage, sexual orientation or other expression of human identity and difference. In this learning community, we welcome discourse and intellectual critique but reject harassment in all of its forms.

## **SUPPORT**

### **Disability Statement**

If you have a physical, learning, sensory or psychological disability and require accommodations, please let us know as soon as possible. You will need to register with, and provide documentation of your disability to, University Disability Support Services (UDSS) in SEO, room 330, Knight Hall.

### **Writing and Oral Communication Support**

University of Wyoming data indicates students who seek additional support for their coursework tend to do better.

As your instructor, I am here to support your work, including your writing AND design efforts. I will be actively engaged in your work throughout the course, in class and in response to assignments. We will meet throughout the semester during one-on-one meetings dedicated to discussing your work as you progress through the course. I am also available for additional meetings during office hours or by appointment. I will provide regular feedback on your work, and I will bring in resources, suggest additional readings, etc., as I think you may find them useful.

### **UW Writing Center | 302 Coe Library**

Helps writers at any stage of the writing process. With a focus on teaching and learning, the Writing Center is not a "fix-it shop," but they help writers identify, articulate, and implement improvements and corrections to their writing. You can drop in to see if a consultant is available and/or schedule an appointment online at [www.uwyo.edu/ctl/writing-center/](http://www.uwyo.edu/ctl/writing-center/).

### **UW Oral Communication Center | 422 Ross Hall**

Helps speakers at any stage of the presentation process, including prep for proposal presentations and thesis defenses. Not a fix-it shop, but can help you practice responding to questions, identifying unclear aspects of presentations, etc. You can drop in to see if a consultant is available and/or schedule an appointment online at [www.uwyo.edu/cojo/occ/](http://www.uwyo.edu/cojo/occ/).

## **THE BASICS**

### **Course Description**

Through a studio-like format, this course emphasizes a) best practices in graphic design and b) the role of science visualizations in current and historical perceptions of societal relationships to nature, natural history, and science. Examples of the types of visualizations students may produce include infographics, maps, public-friendly figures, and web-based images.

Students are expected to come to class ready to discuss and work to visualize key concepts or results from their discipline and/or their own research. Through hands-on, project-based coursework, students will create images that convey these concepts.

Students will have opportunities to learn from (and possibly collaborate) with local artists, graphic

designers, consultants, and faculty from several units on campus within and beyond the sciences.

### Course Websites

- WyoCourses (<https://uwyo.instructure.com/courses/503506>); internal, for submitting assignments, etc.
- Public-facing site for sharing your work and practicing public/popular image curation and writing, etc. ([engagelaramiescience.weebly.com/](http://engagelaramiescience.weebly.com/)). See syllabus pages 6-7 for details.

### Course Objectives

- Learn about and practice essential skills of effective visual science communication
- Learn about and practice best practices for how to develop visuals for a range of audiences so your research can inspire and educate.

### Anticipated Skill Takeaways

- Experience with graphic design software and online apps
- Foundational illustration skills
- Experience refining science message/story for specific target audiences
- Experience relating science message/story to other topics
- Experience dealing with image curation and ethics of using images for scicomm
- "Branding" yourself and your science
- Social media experience (posting, planning, useful apps, science of scicomm for social media)
- Blog writing experience
- Experience integrating best practices in graphic design into figure plotting in R

### Anticipated Course Outcomes

- Understanding how public-facing design can enhance scientific figures and presentations;
- Understanding best practices in graphic design, including designing for accessibility; and
- Presentation-ready graphics about: a key concept, an ecosystem/study site, and at least one more of your choice. These will be portfolio pieces you can use to demonstrate to potential employers, collaborators, and funders how you're able to integrate traditional and 21st-century communication skills to make your research accessible and interesting to non-specialist audiences (and those within your field).

### Email and Staying in Touch

I am willing to help if you're having any difficulty, so please don't hesitate to schedule an extended meeting if you have questions, concerns, or difficulties with the class or beyond. I check email regularly weekdays from 9AM-5PM. Still, there are times when it may take a day or more to reply to your messages, so plan accordingly. Please check your e-mail daily so you can stay abreast of any ZOO 5980-4 course updates.

I will use WyoCourses as needed to revise our schedule of activities, as well as to archive supplemental readings and materials. To that end, be sure to check all your settings within WyoCourses, and adjust them to ensure you receive updates (via announcements, assignment postings, etc.) from within the course system. After the first week of classes, all announcements will be distributed via WyoCourses, *not* via emails.

## REQUIRED MATERIALS

### You!

Every day, you will be responsible for engaging in class discussion as an informed, thoughtful, and respectful classmate. In order to get the most out of class, and to be a valuable addition to your classmates' experiences, please arrive in class having engaged with the material assigned. Most importantly, strive to bring your enthusiasm, curiosity, and good will to class every day. But, I get it – life happens. We'll work together to mitigate.

### Course texts

All course texts will be provided. Most material will be posted on WyoCourses. If you wish to use e-versions of course readings, you may use personal technology in class. Audio or video recording in class is prohibited unless prior authorization is granted.

### Note-taking/drafting

Some research suggests that writing notes on paper helps you learn and study better. But if you have a need or preference to use a digital device, that's fine. Make sure to bring a writing utensil and assigned readings (printed and/or on a device) to class every day, as well as something to take notes on. A sketchbook or notebook with blank pages or gridded pages (vs lined pages) would be a great idea but is not required.

### Image production

You will choose the materials you use to create visuals in this class. Possibilities include traditional media (including pencils, pens, markers, crayons, colored pencils, and various types of paints, 3D medias including clay, etc.) and new media (including digital tablets, digital drawing software, online design apps, video, coding programs, etc.). We will discuss materials options in more detail during the second class. I am always happy to chat about materials, should you have questions or ideas.

### Technology

Whether or not you create digital images, you will need consistent access to a working computer and printer for this course. In the event your computer or printer is not functioning, plan ahead so you are prepared to arrange for your own access to university equipment or contact me well in advance of class, so we can figure out a solution. You will submit digital versions of your work for assignments. Clear photographs of your work done by hand will usually suffice. For 2D work, scanning may result in better-looking versions and will also enable you to access the image in software such as Photoshop or GIMP, should you want to make hybrid visuals. You are welcome to bring your computer/tablet to do and display class-related work.

### Assignments

In-class work will depend upon the design, drafting, writing, revision, research, and other project development work you do outside of class, please come to class with assigned work completed. We will use YOUR work every day for full-class activities, small-group workshops, and individual revision. Always bring a current draft of your work-in-progress to class which you will be able to share with a partner or in a small group. Written work should be printed and brought to class. Visuals can be printed or displayed in their analog or digital form.

## COURSEWORK

Coursework will often build upon previous work, so that you can create final visuals and prepare for presentations and other public-facing work. Thinking and communicating go hand-in-hand,

and thus revision is an essential aspect of the composition and design process. Therefore, most assignments will involve a combination of drafts, peer reviews, and instructor feedback. Demonstrated engagement in this process will be a key component of how your work is graded. You will receive rubrics and explanations of specific expectations, along with brainstorming, research, drafting, and revision assignments, at appropriate stages of each project.

### On-going Assignment Expectations

See "Major Assignments" for more details.

#### Texts (aka readings, videos, etc.)

Texts will be provided electronically. No required texts need be purchased, though I may suggest books you may find valuable as future references. Assigned texts will include a mix of peer-reviewed and popular writings, as well as multimedia (videos, podcasts, etc.). The subject matter will range widely and may include op-eds, research articles, examples of exemplary or problematic science communication, theory, tips or techniques, and so on. Brief written or visual reflections on the texts will often be assigned, to stimulate your own metacognitive thinking about how you are applying the material in the readings. Texts will be provided via links and/or files on WyoCourses. Files will be linked to in relevant assignment and project pages for your convenience. Files will be posted with the following naming style: YYYYMMDD[of class]\_Author\_Title/Topic. These files will be located in two folders on WyoCourses:

- Assigned Readings & In-Class Materials:  
<https://uwyo.instructure.com/courses/503506/files/folder/Assigned%20readings>
- Supplemental Materials:  
[https://uwyo.instructure.com/courses/503506/files/folder/Supplemental%20-%20resources%20\(not%20assigned\\_required\)](https://uwyo.instructure.com/courses/503506/files/folder/Supplemental%20-%20resources%20(not%20assigned_required)).

#### Course website

One student per week, on a rotating basis will work with me to curate and post content from the previous week's assignments. We will establish the schedule the second week of class.

#### Personal social media or blog

Weekly posts, minimum one post per week; I will provide prompts.

### Major Assignments

Please submit files using the following naming style: YYYYMMDD\_FirstLast\_AssignmentName\_1.

#### 1. Participation and Informal Assignments (15% of final grade, divided between Midterm and Final by 10% each):

Every day, you will be responsible for engaging in class discussion as an informed, thoughtful, and respectful classmate. In order to get the most out of class, and to be a valuable addition to your classmates' experiences, please arrive in class having engaged with the material assigned. Similarly, because much in-class work will depend upon the design, drafting, writing, revision, research, and other project development work you do outside of class, please come to class with assigned work completed. Written and visual work that will need to be shared during in-class peer review should be printed and brought to class. Informal assignments may include, but are not limited to: drafts, emails, designs, reflections, analyses, proposals, peer feedback, and practice presentations. Note: reference images, inspiration, and resources should be cited and treated as references for all informal assignment submissions.

## 2. Course Website/Blog and Social Media/Personal Blog (15% of final grade):

These assignments are meant to provide you with real-world experience curating a science-focused social media account and making editorial decisions about the content of a science outreach blog. Both are key aspects of the work of many publicly engaged scientists and professional science communicators. Furthermore, images are central to how these outlets operate, and these assignments will provide you with experience considering the ethics and accessibility of images used to visualize and communicate science.

### Public-facing course website/blog

<http://engagelaramiescience.weebly.com/>: This website is intended to host regular updates from course activities, including projects in progress, social media posts, reflections, plans, struggles, celebrations, etc. You will always have the option to indicate that you do not want your material (submitted homework) to be shared publicly/published on the blog. Each week, 1-2 students in the course will meet with me to curate material for the course blog/website. Students will draft the material, and I will handle posting. *If you want to learn about the back end of using a website, let me know. We can arrange that.*

Component of Complete Blog Post	Complete
Image & image credit/attribution	√
Alt text for image	√
Text to accompany image 100-300 words	√
Social media post sharing blog post	√
Byline (author attribution)	√

### Social media/personal blog:

You will start and/or post to a social media account (select from Twitter, Facebook, and Instagram) or a personal blog at least once per week throughout the semester. Your posts will focus on your work as a scientist but may certainly reveal other facets of your personality and lifestyle. See #scientistselfie on [Instagram](#), [Twitter](#), and [Facebook](#) (or #ScientistsWhoSelfie) for examples of how some scientists approach this balance. You will be shown apps and strategies for planning, scheduling, and strategically using social media as a science engagement mechanism.

You will be provided with weekly prompts to help you explore the potential of your chosen platform. All posts in response to prompts will be graded as complete/incomplete. Complete grades require all four post components outlined below. The expectation is that you will produce original content for these posts, meaning writing and images that are your creation. To put it another way, retweets, regrams, likes, etc., do not qualify as original content. Of course, I encourage you to be more active than a single post per week, and certainly, sharing others' content is a typical part of how you may do that. But, you will be assessed on your original content.

Component of Complete Post	Complete
Image & image credit/attribution	√
Alt text for image	√
Text to accompany image (length depends upon platform)	√
1-3 relevant hashtags &/or @ mentions	√

### 3. Individual Project: Applications of Science Visualizations (40% of final grade)

**Overview:** For the remainder of the semester, you will dedicate time outside of class to research and develop a project proposal, implement that project, and write a report that details your process and reflects on your goals versus outcomes. You should expect to invest significant time into all phases of this project. There will be a few scheduled check-in/update sessions in class, and there will be time to work on your project in class. However, your project will be self-directed, and you should plan to work on it outside of class.

#### **Objectives:**

- 1) Identify a science visualization skill and/or product that you want to pursue and bring to some level of completion by the end of the semester.
- 2) Familiarize yourself with the research literature on efficacy and science of science communication related to the skill/product you want to develop.
- 3) Practice planning, executing, and evaluating a science visualization effort you are invested in.
- 4) Practice developing a science visualization product/effort for a specific, non-specialist audience.

The big idea here is for you to succeed in developing something personally and professionally meaningful for you. So, of course, I will support you as best we can. This will, at a minimum, include 1) connecting you to relevant expertise on campus and beyond, 2) sharing my own expertise when it is relevant, and 3) meeting with you outside of class to discuss project progress, challenges, etc.

**Possibilities:** This project is the culminating project for the semester. You will create this project by selecting a skill and/or product you'd like to develop to communicate about your research. For example, you might draw a set of comics, produce a short video, design a video game, develop an interactive website, create artwork or music, write lesson plans, draft a grant proposal, etc.

**Project Proposal Expectations:** To ensure your project meets course expectations, is feasible within the time allotted, and is based upon the best available science and techniques for the type of product you propose to develop, you will create a proposal first. The proposal should include sections detailing 1) your concept; 2) identification and characterization of your target audience, including relevant background research; 3) background research (a meaningful but not necessarily exhaustive lit review) that informs both the type of visualization you have chosen to develop and your methods for developing it; 4) the research concept(s)/message(s) (max 2) you intend to convey; 5) a work plan; 6) explanation of motivation for focusing on the project you have chosen. I do understand that you may propose a project that lives beyond this semester - in the sense that its final version may not be possible to complete this semester. I applaud and will happily support projects that go beyond the semester. However, I do expect that you will identify a component of the proposed project that you can complete this semester.

**Final Report Expectations:** The final report should include sections detailing 1) your methods (including documentation of the work-in-progress), work plan, anything that may have had to change (from your proposal); 2) reflection on and additional characterization of your target audience, based on your efforts to develop your project; 3) a detailed lit review including material from your proposal and additional material you found as you worked on the project; 4) the research you communicated; 5) a reflection/self-assessment of the end results. You will be

provided guiding questions for the reflection sections of the report.

**Final Presentation Expectations:** During finals week, you will present your project to the class and invited viewers from within and beyond the department. While the project you present may be a work-in-progress, you should treat this presentation seriously. Practice, and be prepared to articulate and respond to questions on the key components of your final report. Ideally, you will select a target audience for your project which exists in Laramie, so that you can invite people from that audience to your final presentation. While the project you propose may be longer, these final presentations must take no longer than 5 minutes to watch, listen to, or interact with to a meaningful level. Each presentation will be followed by a brief Q&A discussion with your audience (class members, colleagues from your departments, and the people you invited who are “representative” of your intended target audience). Following the individual presentations, we will plan on a panel-type discussion based on the interests of the audience, if time allows. I will arrange for refreshments, and will certainly arrange for a bigger space than our regular classroom if necessary.

## GRADING

### Grade type

This is a pass/fail course. Grading Breakdown:

- Attendance, Participation and Informal Assignments (30%)
- Course Website/Blog (15%)
- Social Media/Personal Blog (15%)
- Public-facing Communication/Engagement Project (40% of final grade; failure to complete the required elements of this project will result in failure of the course.)

### Deadlines

I understand that life happens, and I am happy to be flexible in consideration of that. However, regular failure to complete assignments (informal or formal) and/or low investment/participation in class will be considered when assigning final grades. You are expected to turn in drafts of assignments on the dates they are due. Deadlines will typically be Mondays at 5:00 p.m. This time/date provides time for me to review your submission before our next class. It also respects that you have other things to do with your time in the evenings. Failure to submit assignments on time can result in a reduction in your grade on that assignment and/or in your final course grade. In extreme circumstances, failure to turn in assignments and/or participate in class can result in failure of the course. If you anticipate needing a deadline extension, please make such arrangements at least one week prior to the due date.

### Participation

Your participation in class exercises and discussion is critical to the quality of your experience in the course and the success of your fellow students. You should attend each class session prepared to actively participate in class discussions. Please make every effort to attend and actively participate in each class meeting. However, you are free to choose not to attend a class meeting if the circumstances warrant. Do realize, however, that you are responsible for classes you miss. If low attendance becomes a persistent issue, a more restrictive policy may be put in place. If you anticipate being absent, please plan ahead to turn in assignments, etc. I reserve the right to lower your course grade for poor attendance or routinely late work.

## ACADEMIC INTEGRITY

Participating regularly in discussions and staying up to date on coursework is an important aspect of academic integrity. In addition you must also follow UW's Academic Honesty Code (UW

Regulation 2-114; [bit.ly/uwyoreg-2-114](http://bit.ly/uwyoreg-2-114)), which prohibits acts of plagiarism. For the purposes of this course, plagiarism is presenting the writing, images, or other intellectual property of others as one's own without appropriate permission, attribution and/or citation. Just as you cite written sources, you are expected to attribute images with the same diligence. If you have questions about how to credit and/or cite sources and images in your work, please do not hesitate to seek my assistance.

## PRE/POST SURVEY FOR SCICOMM KNOWLEDGE AND ATTITUDES

Along with Dr. Kristin Landreville (Communication and Journalism Department) and Dr. Jamie Crait (Dir., Wyoming Research Scholars Program; Biology Department), in the graduate and undergraduate courses we are all teaching this academic year, we are tracking students' initial and final attitudes, capabilities, and motivations associated with several modes of public communication about science. To measure prior knowledge and attitudes, and to assess the efficacy of course design and implementation, we are conducting anonymous pre- and post-course surveys. Taking these surveys will be optional and will not affect your grade.

## COURSE SCHEDULE

Some of the semester is pre-arranged. The rest we will determine collaboratively. Everything in this schedule is subject to change. I will provide as much notice as possible if anything changes. Course readings, assignments, and contents will be adjusted to your needs as we move through this together. Such changes may include guest speakers as relevant and possible.

### Key schedule blocks to keep in mind

- Topic-specific office hours once/week, time/day TBD with students: \_\_\_\_\_
- WySCI SciComm Drop-In: Weekly, 2 hours; staffed by scicomm experts from around campus. Time TBA: Wyo Hall, room 245; \_\_\_\_\_
- Week 1- Overview & Introductory Exercises
- Weeks 2-6 (5 weeks)- Visualization Toolkit; product – a refined visual of a key concept, principle, or result from your research
- Weeks 7-11 (5 weeks)- Scenes, Landscapes, and Maps; product – a refined visual of a place or space
- Weeks 12-16 (5 weeks) – Independent Project: Applications of Science Visualizations; product – an individually motivated visual, along with a plan for utilizing it
- Week 16 – finals week; final peer review; see calendar below for details

## COURSE CALENDAR

	<p><b>1- 29 Aug</b></p> <p>Intro &amp; Welcome!</p> <p><i>Office hours theme: general</i></p>	<p><b>In-class</b></p> <ul style="list-style-type: none"> <li>● #SketchYourScience - interview &amp; introduce a partner</li> <li>● Syllabus, including course blog and social media expectations</li> <li>● Introduce scope of what we will consider in Visualizing Science + orientation to history of drawing/science visualization</li> <li>● Skills/capacity inventory</li> <li>● Collective goals</li> <li>● Prep for next week: Social media post, color theory handout, TED talk, your own #SketchYourScience; office hours Doodle poll; gives/gets</li> </ul>	
Concept visualization	<p><b>2 - 5 Sept</b></p> <p>Visualization Toolkit, I</p> <p><i>Office hours theme: Social media 101 (using social media dashboard apps, etc.)</i></p>	<p><b>Due</b></p> <p>Answer: Office hours Doodle poll; gives/gets</p> <p>Read/Watch 2+ (all &lt;10 min):</p> <ul style="list-style-type: none"> <li>● <a href="#">TED Talk: Why people believe they can't draw</a></li> <li>● <a href="#">YouTube: The Dot</a> by Peter H. Reynolds</li> <li>● <a href="#">Why scientists (even non-artists) should draw</a></li> <li>● <a href="#">Darwin wouldn't draw. Seriously.</a></li> </ul> <p>Make: 1. Conduct some research by looking at #SketchYourScience and #MSPaintYourScience on Twitter, Facebook, and/or Instagram. 2. Make your own! Incl. caption &amp; paragraph reflecting on aims for making sketch &amp; how you applied color theory. 3. 1+ paragraphs re your goals for yourself in this class. 4. 1+ paragraph re capacity &amp; skills you bring to this class.</p> <p>Share: Submit your platform/handle on WyoCourses. On selected social media platform, post your #SketchYourScience sketch.</p>	<p><b>In-class</b></p> <ul style="list-style-type: none"> <li>● Peer review: Your #SketchYourScience</li> <li>● Sketching for scientists 101</li> <li>● Prep for next week: social media post; read/watch myth-busting material re drawing; 3 concept sketches plus reflection on process</li> </ul>
	<p><b>3 - 12 Sept</b></p> <p>Visualization Toolkit, II</p>	<p><b>Due</b></p> <p>Read: <a href="#">"Color Theory: An Introduction"</a> handout and <a href="#">10 simple rules for drawing scientific comics</a>. Watch: <a href="#">TED Talk – Doodlers, Unite!</a> (&lt;6 min)</p>	<p><b>In-class</b></p> <ul style="list-style-type: none"> <li>● Concept collages (generating a visual out of lots of ideas)</li> <li>● Peer review: discuss color theory</li> </ul>

	<p><b>3 - 12 Sept (cont.)</b></p> <p><i>Office hours theme: Lines, dots &amp; points</i></p>	<p>Make: Pick a concept central to your research/discipline. 3+ sketches communicating the concept in different ways/&amp; exploring the sketching toolkit. Captions of 1-5 sentences for each sketch. 1+paragraph comparing choices made (e.g., using diff tools in toolkit, objectives of each sketch).</p> <p>Share: Social media post of 1 sketch+ caption from sketches assigned</p>	<p>applications &amp; last week's sketches</p> <ul style="list-style-type: none"> <li>• Prep for next week: social media post; revised concept sketches; read tips for digitizing drawings</li> </ul>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Concept visualization</p>	<p><b>4 - 19 Sept</b></p> <p>Visualization Toolkit, III</p> <p><i>Office hours theme: Shapes</i></p>	<p><b>Due</b> Read: <a href="#">4 tips for digitizing sketches</a></p> <p>Make: Pick one concept sketch to revise. Revise 3 ways using color and/or design strategies., including concept collage. Captions of 1-5 sentences for each. 1+paragraph (total) comparing choices made using diff tools in toolkit &amp; objectives of each sketch.</p> <p>Share: Social media post of one of your revised concept sketches + caption</p>	<p><b>In-class</b></p> <ul style="list-style-type: none"> <li>• Peer review: Concept iterations</li> <li>• Graphic design basics (guest: Brandon Gellis)</li> <li>• Prep for next week: social media post; schedule 10-minute, 1:1 meeting with me to discuss visualizations; refine concept visualization; watch short film &amp; read handout re colorblindness</li> </ul>
	<p><b>5 - 26 Sept</b></p> <p>Visualization Toolkit, IV</p> <p><i>Office hours theme: Color &amp; R</i></p>	<p><b>Due</b> Watch: <a href="#">Ishihara</a> (5.5 minutes)</p> <p>Read: <a href="#">Design considerations for color blind accessibility</a></p> <p>Make: Pick one of your 3 concept sketches from last week; revise/refine and incorporate use of Color Brewer and/or R if appropriate. Design should account for reading re color-blindness. Caption of 1-5 sentences. 1+ paragraph re process to produce it, choices made, etc.</p> <p>Share: Social media post of one of your figures made in R (if relevant)</p>	<p><b>In-class</b></p> <ul style="list-style-type: none"> <li>• Peer review: Semi-final visualizations</li> <li>• Using color in R: Color Brewer, hex codes, etc. (guest instructor)</li> <li>• Prep for next week: social media post, refine visualization, explore digital design &amp; drawing platforms</li> </ul>

Concept visualization	<p><b>6 - 3 Oct</b></p> <p>Visualization Toolkit, V</p> <p><i>Office hours theme: Contour drawings (review)</i></p>	<p><b>Due</b></p> <p>Explore: 2+ digital drawing/design platforms. Examples include: GIMP, Canva, Photoshop, MS Paint, Inkscape, Tableau, Piktochart, Infogram, Timeline from the Knight Lab, Zing Chart, etc.</p> <p>Make: Refine visualization + caption; 1+ paragraph re final decisions, etc.</p> <p>Share: Social media post about a reference image you plan to use, source info, how you know it is okay to use and/or reproduce, etc.</p>	<p><b>In-class</b></p> <ul style="list-style-type: none"> <li>● Peer review: Final visualizations</li> <li>● Digital design &amp; drawing 101</li> <li>● Prep for next week: social media post; read primer on ethical image uses; finalize digital <u>and</u> analog versions of final graphic</li> </ul>
Place/space/map visualization	<p><b>7 - 10 Oct</b></p> <p>Reference Images: Ethical Use &amp; What They're Good For</p> <p><i>Office hours theme: Digital drawing &amp; design programs</i></p>	<p><b>Due</b></p> <p>Make: Finalize digital and analog versions of your final graphic (i.e., make one using a digital program and make a version by hand).</p> <p>Read: Parts 1-4 of <a href="#">this series</a> on ethical use of images for science communication and education. Come to class with 3-5 ethically sourced reference images. Be prepared to talk about where you got them, what you will use them for, etc.</p> <p>Share: Social media post about shot list or draft sketch(es)</p>	<p><b>In-class</b></p> <ul style="list-style-type: none"> <li>● Peer review: digital &amp; analog versions of concept visualization</li> <li>● Shot list of your research</li> <li>● 3+ sketches or ideas for place/space or map (use reference images)</li> <li>● Prep for next week: 2+ draft sketches of place/space/map based on your reference images</li> </ul>
	<p><b>8 - 17 Oct</b></p> <p>Plotting maps in R</p> <p><i>Office hours theme: Size &amp; scale</i></p>	<p><b>Due</b></p> <p>Read: <i>How to Lie with Maps</i>, chapter ...</p> <p>Make: 3+ draft sketches of place/space or map using reference images, 1+ sentence captions. 1+ paragraph explaining intention, choices, questions, etc. Submit shot list (ideas &amp; images) from in class, too.</p> <p>Share: Social media post of 1 sketch+ caption from sketches assigned</p>	<p><b>In-class</b></p> <ul style="list-style-type: none"> <li>● Peer review: drafts</li> <li>● Plotting maps in R w/ guest (TBD)</li> <li>● Prep for next week: explore pudding.cool; iterate on PSM visual; social media post</li> </ul>

Place/space/map visualization	<p><b>9 - 24 Oct</b></p> <p>Refining visuals</p> <p><i>Office hours theme: Plotting maps in R</i></p>	<p><b>Due</b></p> <p>Explore: pudding.cool, to have a look at a wide range of approaches to data visualization</p> <p>Make: Pick one concept sketch to revise. Revise 3 ways using color and/or design strategies., including concept collage. Captions of 1-5 sentences for each. 1+paragraph (total) comparing choices made using diff tools in toolkit &amp; objectives of each sketch.</p> <p>Share: Social media post of one of your revised concept sketches + caption</p>	<p><b>In-class</b></p> <ul style="list-style-type: none"> <li>Peer review: concept sketches</li> <li>Prep for next week: 3+ examples of visualizations from your field; refine PSM visualization; social media post; schedule 10-minute, 1:1 meeting with me to discuss visualizations;</li> </ul>
	<p><b>10 - 31 Oct</b></p> <p>Refining visuals</p> <p><i>Office hours theme: Size &amp; scale Texture &amp; mark making (review)</i></p>	<p><b>Due</b></p> <p>Research: Research/bring to class 3+ examples of science visualizations (in your field) that are tailored to distinct public audiences (children, adults, special interest/demographic group). Be prepared to talk about how the communication is tailored for each group and to critique it (+s &amp; -s)</p> <p>Make: Pick one of your 3 concept sketches from last week; revise/refine and incorporate use of Color Brewer and/or R if appropriate. Design should account for color-blindness. Caption of 1-5 sentences. 1+ paragraph re process to produce it, choices made, etc.</p> <p>Share: Social media post of your graphic</p>	<p><b>In-class</b></p> <ul style="list-style-type: none"> <li>Discuss field- and audience-specific visuals</li> <li>Peer review: refined PSM visuals; social media post</li> <li>Prep for next week: draft project proposal</li> </ul>
	<p><b>11 - 7 Nov</b></p> <p>Indiv project examples</p> <p><i>Office hours theme: Contrast, value, variety &amp; focal points</i></p>	<p><b>Due</b></p> <p>Make: Refine visualization + caption; 1+ paragraph re final decisions, etc.; draft project proposal (1 page)</p> <p>Share: Social media post of your graphic</p>	<p><b>In-class</b></p> <ul style="list-style-type: none"> <li>Guests: Chelsea Duball, Melanie Torres, Dan Albrecht-Malinger, Michelle Mason</li> <li>Peer review: refined PSM visuals</li> <li>"Field trip" to the CAVE</li> <li>Prep for next week: schedule 10-minute, 1:1 meeting with me to discuss project proposal; social media post</li> </ul>

Individual project	<p><b>12 -14 Nov</b></p> <p>Science Visuals in Museums</p> <p><i>Office hours theme: Repetition</i></p>	<p><b>Due</b> Explore: UW Geology Museum (prep for discussion w/ Dr. Sarah Prather); complete related exercises/notes</p> <p>Make: Refine draft project proposal</p> <p>Share: Social media post of one or more of your project ideas</p>	<p><b>In-class</b></p> <ul style="list-style-type: none"> <li>• Discussion with guest: Sarah Prather (neuroscientist, science museum exhibit design specialist)</li> <li>• Prep for next week: peer review of project proposal; social media post</li> </ul>
	<p><b>13 -21 Nov - no class</b></p> <p><i>Office hours theme: Symmetry, asymmetry &amp; balance</i></p>	<p><b>Due</b> Make: Final project proposal</p> <p>Share: Social media post of your project idea</p>	<p><b>Thanksgiving Break - no class</b> Use this time to work on your individual projects.</p> <p>Prep for next week; social media post; report draft 1</p>
	<p><b>12 -14 Nov</b></p> <p>Science Visuals as Public Art</p> <p><i>Office hours theme: color theory review</i></p>	<p><b>Due</b> Make: Report draft 1</p> <p>Share: Social media post of something from your research/lit review</p>	<p><b>In-class</b></p> <ul style="list-style-type: none"> <li>• TENT.: Meg Thompson, Brandon Gellis (Topo projection project)</li> <li>• Prep for next week: social media post; schedule 10-minute, 1:1 meeting with me to discuss visualizations; outline for final presentation; report draft 2</li> </ul>
	<p><b>15 - 5 Dec</b></p> <p>Practice Presentations</p> <p><i>Office hours theme: Unity, harmony &amp; irregularity</i></p>	<p><b>Due</b> Make: Report draft 2; draft of final presentation</p> <p>Share: Social media post of your title slide for your presentation</p>	<p><b>In-class</b></p> <ul style="list-style-type: none"> <li>• Practice final presentations on individual projects</li> <li>• Post-course survey</li> <li>• Please provide your contact info for the 6-month survey. It's shorter, promise! :)</li> </ul>

Presentation	<b>16 – finals week*</b>  Final presentations	<b>Due</b> <ul style="list-style-type: none"> <li>● Final presentations on individual projects (Presentations will be open to the public.)</li> <li>● Final reports due</li> </ul>	<b>In-class</b> <ul style="list-style-type: none"> <li>● Final presentations/peer review</li> </ul>
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\*Since our course spans two time slots, we could potentially meet at either of the following times: We will discuss this as the semester progresses.

- Wednesday, December 12 8:00 am - 10:00 am
- Friday, December 14 10:15 am - 12:15 pm