ENGL/FILM 143
Visualizing Knowledge: From Data to Images
University of Maryland
fall 2020

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Course meetings: TBD
Course ELMS site: TBD

Course description
This course pulls back the curtain on a ubiquitous feature of contemporary life—data visualization. We know that we live in an age of information, but what is less obvious is how visualization practices shape that information. This course examines the history of visualization practices, the theories of image-making that guide their production, and the current state of the art. We will take on the old adage that a picture is worth a thousand words by pursuing an understanding of how pictures can encompass millions of data points as well.

Visualizations do not show us things that are evident—visualizations make things evident. Visualizations, in other words, reveal something about the world that would not have been obvious without the work they do. "Visualizing Knowledge" will provide students an opportunity to engage critically with a wide range of information visualization practices, gaining an understanding of the work involved in producing them and their histories. We will discuss a series of case studies, and students will be expected to seek out contemporary visualizations, interact with practitioners who produce them, and produce their own visualization as a response and/or critique.

This course is forms the academic component of the Carillon Community: Visualizing Knowledge. The Carillon Community Mission is to create an inspiring and supportive living and learning environment for first year students. Carillon promotes an environment where students develop a sense of belonging and trust to support their academic success and <u>inn</u>ovative thought. In Carillon, students consider their own interests and knowledge, and become more active agents in their own education.

Course Questions
ENGL/FILM 143 fulfills the General Education requirements of both an I-Series and a Humanities course. In ENGL/FILM 143, the **I-Series question is: Is data beautiful?** In an I-Series course, students will encounter many of the ideas that make media studies an exciting discipline. The I of I-Series also suggests that each student is the agent of his/her own education. I-series courses are active-learning courses; you will learn by doing.

This course includes a semester-long team project. Teams will be assigned at the beginning of the semester. With your team, you will complete a contract that indicates how you will work to

achieve the project and team goals. Some of the work for the project will be assessed for a team grade and some will be assessed for an individual grade.

Learning outcomes
By the end of this course you will be able to:

1. Analyze a broad range of data visualizations in a variety of media, tracing their construction from the underlying data to the finished product and taking into account not only the methods used in their construction but also the accompanying constraints that the choice of method entails.
2. Synthesize the individual case studies into general insights about how data visualizations function, which will lead to an overarching sense of historical and generic characteristics of data visualization.
3. Write clearly and cogently about the case studies introduced in class. You will have an opportunity to write in a variety of modes, from academic analysis to reflections for a more general audience.
4. Use at least one method for creating a data visualization. While the aim of the course is not to train students how to work in any particular area of data visualization, it does require an engagement with the process of visualization in order to allow for an appreciation of the challenges and complexities of production.

Readings
Readings will be distributed via ELMS.
See the weekly schedule for specific assignments. Please read the assigned material before class and come prepared to discuss it.

Communication
- The official forni of communication for the University is via email. The University expects that your contact information is current in Testudo (www .testudo. umd.edu).
- For this course we will communicate via email, ELMS conversations and ELMS announcements. It is expected that you will regularly check your email and the course ELMS site. *Note that ELMS has options for notifications, configure your notification settings appropriately. Be sure to provide the most appropriate email in your student information in Testudo.*
- When communicating with the course instructor or other students, use an informative and appropriate subject (eg. COURSE NAME Your Name Absence From Class), and use salutations and a signature in all correspondence.

When communicating about course work and in the case of an extended UMD emergency closure, I will send the class an email announcement and post an announcement in ELMS

Course Expectations
1. Carefully read and follow the UMD Policies - see below.
2. Students are expected to attend classes regularly, come to class on time, participate fully by completing assignments according to the guidelines provided by the due date,

engaging in discussions by listening respectfully to others, sharing ideas and asking questions, and by being a strong contributor in team projects.
3. Students are expected to exercise professionalism and participate in an atmosphere of mutual respect.
4. In this course you will have team and individual work. Team work will be graded as indicated below and will reflect the collaborative effort of the team members. Individual work is expected to reflect your own words and work.

UMD Policies
All course policies support University Policies found in
http://www.ugst.umd.edu/courserelatedpolicies.htm1
Topics that are addressed in these various policies include academic integrity, student and instructor conduct, accessibility and accommodations, attendance and excused absences, grades and appeals, copyright and intellectual property.

It is your responsibility to understand your rights and responsibilities as expressed in these policies. This page also provides information about valuable resources to support your academic success, as well as overall health and well-being.

Course Policies
Attendance
   • As this is a class where in-class participation forms a significant part of the work of the course, it is expected that students will attend all course meetings. See Course Schedule regarding the graded work that will occur during class meeting times.

Absence from class or late work due to an excused absence
   • If you will be absent from class or are not able to meet a course deadline notify your course instructor as soon as feasible by sending an email with the subject line: *COURSE NAME Your Name* Absence From Class.
        o For planned absences, notify your instructor prior to the end of the Schedule Adjustment Period (See Testudo Schedule of Classes).
   • If your absence meets the criteria for an excused absence (see UMD policy on Excused Absences):
        o Depending upon the circumstance, you may be required to present documentation or in the case of a medical absence, a self-signed note.
        O You will be provided an opportunity to make up class work.
   • Students must meet with the course instructor following an unexcused absence from class.

Accommodations
   • Students who have approved academic accommodations from the Accessibility and Disability Service must schedule a meeting regarding the Acknowledgement of Student Request form prior to the end of the Schedule Adjustment Period (See Testudo Schedule

of Classes) or if accommodations are approved mid semester, as soon as possible after accommodations are approved.

Due Dates
Due dates for all assignments are listed in the Course Schedule. Each assignment will indicate the submission method required. Refer to the specific assignment. Only work submitted in the appropriate format on the due date/time will receive credit.

Course Grading
The final course grade consists of two components, the ten weekly assignments and the group project. The ten weekly assignments will be graded on a scale of 1-10, with five points awarded for timely completion of the assignment and the remaining points awarded according to a rubric. The team project will consist of three stages, each of which will be worth one third of the total of 100 points. The total points for the weekly assignments and the team project will be added together and divided by two to determine the final course grade.

Thus:
10 weekly assignments worth a maximum of 10 points = 100 points
1 team project, subdivided into three stages, each worth 33.3 points = 100 points

The course points will be recorded in ELMS. It is the student's responsibility to review course points in ELMS and inform the instructor if the recorded points do not agree with grades received on student work.

100 - 97: A+	89 - 87: B+	79-77:C+	69-67:D+	59 and below: F
96-93: A	86-83: B	76-73: C	66-63: D	
92-90: A-	82 - 80: B-	72-70: C-	62 - 60: D-	

Team work
You will work with an assigned team to complete the team project. Working in a team is a particularly useful configuration for this class, since most visualizations are produced by teams as well, so our collaboration will give us an opportunity to model and thus gain insight into how visualizations are created.

The team project will consist of three stages. Before we get started, we will generate an inventory of visualization units at UMD and in the area, which will form a list of projects to choose from for the group project. For the first stage, the team will perform a critical analysis of a visualization, building on the historical and critical framework elaborated in the first weeks of class. For the second stage, the team will conduct and publish an interview with a current visualizer. The third stage will involve the team creating their own visualization, probably using the underlying tools from the visualization analyzed in the first two stages of the project.

Teamwork will be assessed using the General Education learning outcomes for collaboration, which will evaluate teamwork in the areas of team process, accountability, and climate/culture.

The team process component involves planning, shared responsibilities, and the establishment of constructive norms for project management (regular meetings, attendance, deadlines, time for revision, defined roles, active listening, and open sharing of ideas). Team accountability involves learning, communication and synthesis, i.e., team members who can explain details of the project, timely communication, and individual accountability. Team climate/culture involves active expression of diverse viewpoints, constructive feedback, and the reconciliation of divergent perspectives. For your learning and for the success of the project it is expected that you will contribute fully to the work of the team. Over the course of the team project, you will have the opportunity to evaluate your peers. If peer review indicates that you have not contributed according to the expected level to the team project, upon instructor confirmation, you will receive a percentage of the team grade that reflects your level of participation.

Weekly assignments
The purpose of the weekly assignments is to aid with comprehension of that week's reading and viewing. Students will receive the assignments before the first meeting for the week, they will work on the assignment over the course of the week, and they will have a regularly scheduled time in class to go over questions about the assignments with the instructor and the TA.

Course Schedule
Announcement of changes will be posted on the ELMS site and announced in class.

Week 1
Introduction to Information Visualization: Issues and Methods

Michael Lynch, "The Externalised Retina: Selection and Mathematization in the Visual
Documentation of Objects in the Life Sciences," in *Representation in Scientific Practice*, ed.
Michael Lynch and Steve Woolgar (Cambridge, Mass.: MIT Press, 1990)
Jacques Bertin, *Semiology of Graphics: Diagrams, Networks, Maps,* trans. W. J. Berg (Madison:
University of Wisconsin Press, 1984), pp. i-13.

Week 2
Maps, Timelines, Trees

Reading:
Edward Tufte, ch. 2 "Visual and Statistical Thinking: Displays of Evidence for Decision
Making," [on Snow's cholera map] (Cheshire, CT: Graphics Press, 1997), 27-37.
Anthony Grafton and Daniel Rosenberg, *Cartographies of Time: A History of the Timeline*
(Princeton, NJ: Princeton Architectural Press, 2010) (selections)
Manuel Lima, *The Book of Trees: Visualizing Branches of Knowledge* (Princeton, NJ: Princeton
Architectural Press, 2014) (selections)
Nicholas Felton, *Photoviz: Visualizing Information through Photography* (Berlin: Gestalten,
2016) (selections)

Viewing: Slave-trade an i m ati on *;* ship map

Week 3
How to See Climate Change—Global Views

Weekly assignment #1 due

Reading: Paul N. Edwards, "Global Climate Science, Uncertainty and Politics: Data-Laden
Models, Model-Filtered Data," *Science as Culture* 8, no. 4 (1999): 437-72.
Naomi Oreskes, "The Role of Quantitative Models in Science," in *The Role of Models in
Ecosystem Science,* ed. Charles D. Canham, Jonathan J. Cole, and William K. Lauenroth
(Princeton, NJ: Princeton University Press, 2003)

Viewing:
An Inconvenient Truth (Davis Guggenheim, 2006)

Week 4
Seeing Disease—Visualizing Contagion

Weekly assignment #2 due

Reading:
Priscilla Wald, *Contagious: Cultures, Carriers, and the Outbreak Narrative* (Durham, NC: Duke University Press, 2008) (selection)
Kirsten Ostherr, *Cinematic Prophylaxis: Globalization and Contagion in the Discourse of World Health* (Durham, NC: Duke University Press, 2005) (selection)

Viewing:
The Story of Cholera (Yoni Goodman for Global Health Media Project, 2011)
Contagion (Stephen Soderbergh, 2011)

Week 5
Bio-Medical Visualization: The Visible Human Project and Molecular Movies

Weekly assignment #3 due

Reading:
Drew Endy and Roger Brent, "Modelling Cellular Behavior," *Nature* 409 (January 18, 2001): 391-95.
Eric Francoeur, "Gyms Levinthal, the Kluge and the Origins of Interactive Molecular Graphics," *Endeavour* 26, no. 4 (2002): 127-31.
Paula Treichler, Lisa Cartwright, and Constance Penley, "The Visible Woman: Imaging Technologies," *Gender and Science* (New York: New York University Press, 1998).
Lisa Cartwright, "The Visible Man," in *Processed Lives: Gender and Technology in Everyday Life,* ed. Jennifer Terry and Melodie Calvert (New York: Routledge, 1997).

Viewing:
Visible Human website (NEM)
The Inner Life of a Cell (Robert Lue, 2006)

Week 6
Paleovisualization: Walking with (and Running from) Dinosaurs

Weekly assignment #4 due

Reading:
Oliver Gaycken, "'Don't You Mean Extinct?': On the Circulation of Knowledge in *Jurassic Park,"* in *Special Effects: New Histories, Theories, Contexts,* ed. Michael S. Duffy, Dan North, and Bob Rehak (London: British Film Insitute / Palgrave Macmillan, 2015), 241-53.

Viewing:
Jurassic Park (Stephen Spielberg, 1992)

Week 7
Forensic Media

Weekly assignment #5 due

Reading:
Katherine Godden, "Cartoon Criminals: The Unclear Future of Computer Animation in the Minnesota Criminal Courtroom - State V. Stewart," *William Mitchell Law Review,* 2003.
Michael Lynch and Ruth McNally, "'Science,' 'Common Sense,' and DNA Evidence: A Legal Controversy about the Public Understanding of Science," *Public Understanding of Science* 12 (2003): 83-103.

Viewing:
9/11 report animations
Smithsonian network's *Air Disasters*

Week 8
Immersive media: CAVEs, AR, VR

Weekly assignment #6 due

Reading:
Jane McGonigal, "'This Is Not a Game': Immersive Aesthetics and Collective Play," *Melbourne DAC 2003 Streamingworlds Conference Proceedings.*
Henry Jenkins, *Convergence Culture: Where Old and New Media Collide* (New York: New York University Press, 2008) (selection)

Viewing:
Visit to Augmentarium

Week 9
Design Thinking—SF as Diegetic Prototype
Weekly assignment #7 due

Reading:
David Kirby, *Lab Coats in Hollywood: Science, Scientists, and Cinema* (Cambridge, Mass.: MIT Press, 2011) (selection)

Viewing:
2001 (Stanley Kubrick, 1968)
Blade Runner (Ridley Scott, 1982)
Minority Report (Stephen Spielberg, 2002)

Week 10
Digital Humanities and Data Visualization: The Case of *Frankenstein*

Weekly assignment #8 due

Reading:
Franco Moretti, *Graphs, Maps, Trees: Abstract Models for Literary History* (New York: Verso, 2007) (selection)
Johanna Drucker, *Graphesis: Visual Forms of Knowledge Production* (Cambridge, Mass.: Harvard University Press, 2014) (selection)

Viewing:
Aspects of the Shelley-Godwin Archive

Week 11
Business Aesthetics—Gilbreth's Media

Weekly assignment #9 due

Reading:
Florian Hoof, *Angels of Efficiency: A Media History of Business Consulting* (New York: Oxford University Press, 2018) (selection)

Viewing:
Tableau software
Gilbreth's motion studies (via NFPF website)

Week 12
Beautiful Evidence—Appropriative and Inherent Aesthetics

Weekly assignment #10 due

Reading:
André Bazin, "Accidental Beauty"

Viewing:
Group-curated examples of contemporary art engagements with data visualization

Week 13
Thanksgiving recess

Week 14
Group presentations

Week 15
Group presentations

Week 16