

Status: Ready

THE NEW SCHOOL  
PARSONS SCHOOL OF DESIGN  
MS DATA VISUALIZATION

## Data Visualization and Information Aesthetics

PGDV 5100  
CRN XXXX

SYLLABUS TEMPLATE

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MS DATA VISUALIZATION

## Data Visualization and Information Aesthetics

PGDV 5100  
CRN XXXX

[Faculty first and last name]

[GroupWise email address]

[Office phone number]

[Office hours (if held) or by appointment only or by email]

Class website: <https://canvas.newschool.edu/courses/XXXXXXX>

Credits: 3

Learning Envelope: Contact 3 / Task 6 / Total hours 9

Open to: Graduate students across the New School

### DESCRIPTION

This is a seminal course on information design and aesthetics. Students will study graphical theory, graph grammar, and investigate hierarchies, patterns, and relationships in data structures. Students will examine the role of scale, proportion, color, form, structure, motion, and composition in data visualization. Using computational methods, students will create drawings, graphs, indexes, and maps that explore the database as cultural form. The function of this course is to build a community among the students and orient them to the whole program.

### CONTEXT

This studio course is an introduction to data visualization, promoting data literacy and visualization competencies for visual artists, designers, and analysts. With a focus on social engagement, this course prepares students with the critical skills to advocate visually and the intellectual context to engage a world in which data increasingly shapes opinion, policy, and decision making.

Students will learn to curate and uncover insights from large and complex data sets. Using cloud-based web technologies, JavaScript, and Processing, students will create drawings, graphs, indexes, and maps. Software influences all aspects of visual media. Media theorist Friedrich Kittler argued that students today should know at least two software languages, “only then they'll be able to say something about what 'culture' is at the moment” (Manovich, 2013). The class will draw upon programming skills acquired in other classes. Basic coding and design knowledge are expected.

Students will familiarize themselves with the necessary vocabulary to communicate and collaborate with data visualization professionals in future contexts. Throughout the course, students work with Canvas to collect and share resources and submit assignments. A series of presentations, screenings, readings, and discussions exposes students to artists and designers working in the context of data visualization and the digital arts. Each student will select a research topic, and present a research report in conjunction with an in-class discussion. Assignments are invitations to invent and experiment. Creative and ambitious experiments are evaluated high, while obvious and easily attained solutions are evaluated low. The complexity of the assignments increases as the semester progresses. Students are required to document their iterative design process and have it available to present during each class session. Active contribution during class is required. All assignments must be completed to pass the course. Assignments are only considered complete when available on Canvas. Late assignments and attendance will reduce grades proportionally.

## COURSE OUTLINE

WEEK 1	DATE	Introduction, Syllabus Handed Out Syllabus review Overview of Data Visualization	Assignment: Reading for next class, Individual Research Reports
WEEK 2	DATE	Mapping Time Research Reports	Due: Reading Assignment: Exercise 1
WEEK 3	DATE	Review Exercise 1	Due: Exercise 1 Assignment: Exercise 2
WEEK 4	DATE	Mapping Quantities, Categories, and Summarized Data	Due: Research Reports
WEEK 5	DATE	Review Exercise 2	Due: Exercise 2 Assignment: Exercise 3
WEEK 6	DATE	Mapping Textual and Qualitative Data	Due: Research Reports
WEEK 7	DATE	Review Exercise 3	Due: Exercise 3 Assignment: Exercise 4
WEEK 8	DATE	Mapping Space	Due: Research Reports
WEEK 9	DATE	Review Exercise 4	Due: Exercise 4 Assignment: Final Project
WEEK 10	DATE	Mapping Hierarchies and Networks Review Final Project Sources	Due Final Project Sources, Research Reports

			Assignment: Final Project Proposal
WEEK 11	DATE	Review Final Project Proposal	Due: Final Project Proposal Assignment: Final Project Prototype
WEEK 12	DATE	Lab, Group Discussion	Due: Research Reports
WEEK 13	DATE	Review Final Project Prototype	Due: Final Project Prototype
WEEK 14	DATE	Lab, Individual Discussion	Due: Research Reports
WEEK 15	DATE	Review Final Project	Due: Final Project

## LEARNING OUTCOMES

1. Develop a deep understanding of the various methods and techniques of modern data visualization, as well as its historical context.
2. Develop skills to design effective visual communication and information displays, by learning a framework for educated exploration and invention.
3. Gain experience in describing, analyzing, and evaluating various data visualization approaches through recurrent presentations and critiques.

## ASSESSABLE TASKS

- Develop Exercise 1: Visualize Time (week 3)
- Develop Exercise 2: Visualize quantities, categories, and summarized Data (week 5)
- Develop Exercise 3: Visualize textual and qualitative Data (week 7)
- Develop Exercise 4: Visualize geospatial data (week 9)
- Present a research report on subject assigned during first class session (due on individually assigned date)
- Document research and design process in Learning Portfolio (due weekly)
- Collect sources for the final project (due: week 10)
- Develop a proposal for the final project (due: week 11)
- Create a prototype for the final project (due: week 13)
- Create and Demonstrate the final project (due: week 15)

## FINAL GRADE CALCULATION

10%: Exercise 1 – Mapping Time  
10%: Exercise 2 – Mapping Quantities, Categories, and Summarized Data  
10%: Exercise 3 – Mapping Textual and Qualitative Data  
10%: Exercise 4 – Mapping Space  
10%: Research Report  
10%: Learning Portfolio  
10%: Class Participation + Attendance  
30%: Final Project  
100%: Total

## REQUIRED READING

Manovich, L.: Software Takes Command (excerpt)

<https://getit.library.nyu.edu/go/9370312?umlaut.institution=NS>

## RECOMMENDED READING

Reas, Casey & Fry, Ben (2014) *Processing: A Programming Handbook for Visual Designers and Artists (Second Edition)*. London and Cambridge: The MIT Press. (excerpt)

<https://getit.library.nyu.edu/go/9375055?umlaut.institution=NS>

Reas, C., McWilliams C., LUST. *Form and Code: In Design, Art, and Architecture*. New York, NY: Princeton Architectural Press, 2010.

<https://getit.library.nyu.edu/go/9370313?umlaut.institution=NS>

Bohnacker et al: *Generative Design: Visualize, Program, and Create with Processing*

<https://getit.library.nyu.edu/go/9370313?umlaut.institution=NS>

Lima, M.: *Visual Complexity: Mapping Patterns of Information*

<https://getit.library.nyu.edu/go/9370308?umlaut.institution=NS>

Shanken, Edward A., ed. *Systems*. London and Cambridge, MA: Whitechapel Gallery and The MIT Press, 2015.

<https://getit.library.nyu.edu/go/9384459?umlaut.institution=NS>

Crary, Jonathan. *24/7: Late Capitalism and the Ends of Sleep*. London, New York: Verso Books, 2013.

<https://getit.library.nyu.edu/go/9384458?umlaut.institution=NS>

## SUPPLEMENTAL READING

Fry, Ben. *Visualizing Data: Exploring and Explaining Data with the Processing Environment*. Sebastopol, CA: O'Reilly Media, 2008.

Harmon, Katharine. *The Map as Art: Contemporary Artists Explore Cartography*. New York, NY: Princeton Architectural Press, 2010.

Harris, Robert. *Information Graphics: A Comprehensive Illustrated Reference*. New York, NY: Oxford University Press, 2000.

Klanten, Robert, Sven Ehmann, Nicolas Bourquin. *Data Flow: Visualising Information in Graphic Design*. New York, NY: Die Gestalten Verlag, 2008.

McCandless, David. *Information is Beautiful*. New York, NY: Harper Collins, 2012.

Playfair, William. *The Commercial and Political Atlas and Statistical Breviary*. Cambridge: Cambridge University Press, 2005.

Rendgen, Sandra. *Information Graphics*. Cologne, Germany: Taschen, 2012.

Rosenberg, Daniel, and Anthony Grafton. *Cartographies of Time: A History of the Timeline*. New York, NY: Princeton Architectural Press, 2010.

Staley, David J. *Computers, Visualization, and History: How New Technology Will Transform Our Understanding of the Past*. Armonk, NY: M. E. Sharpe, 2002.

Tufte, Edward. *The Cognitive Style of Powerpoint*. Cheshire, CT: Graphics Press, 2003.

Tufte, Edward. *Envisioning Information*. Cheshire, CT: Graphics Press, 1990.

Tufte, Edward. *The Visual Display of Quantitative Information*. 2nd Edition. Cheshire, CT: Graphics Press, 2001.

Tufte, Edward. *Beautiful Evidence*. Cheshire, CT: Graphics Press, 2006.

Tufte, Edward. *Visual Explanations*. Cheshire, CT: Graphics Press, 1997.

Tufte, Edward. *Envisioning Information*. Cheshire, CT: Graphics Press, 1990.

Thomas, James J., and Kristin A. Cook. *Illuminating the Path: The Research and Development*

Sauter, Daniel. *Rapid Android Development: Build Rich, Sensor-Based Applications with Processing*. Dallas, TX; Texas, NC: The Pragmatic Bookshelf, 2013.

Agenda for Visual Analytics. Richland, WA: National Visualization and Analytics Center, 2005.

Wong, Dona. *The Wall Street Journal Guide to Information Graphics: The Dos and Don'ts of Presenting Data, Facts, and Figures*. New York, NY: W. W. Norton & Company, 2010.

Yau, Nathan. *Visualize This: The Flowing Data Guide to Design, Visualization, and Statistics*. Hoboken, NJ: Wiley, 2011.

"A Layered Grammar of Graphics", Hadley Wickham, *Journal of Computational and Graphical Statistics*, Volume 19, Number 1, Pages 3–28: <http://vita.had.co.nz/papers/layered-grammar.pdf>

Tukey, John. "Some Graphic and Semigraphic Displays." *Statistical Papers in Honor of George W. Snedecor*, 293-316, 1972.

Cleveland, William S.; McGill, Robert. "Graphical Perception: Theory, Experimentation, and Application to the Development of Graphical Methods." *Journal of the American Statistical Association* 79(387), 531-554, 1984.

Cairo, Alberto. *The Functional Art: An introduction to information graphics and visualization*. San Francisco, CA: New Riders, 2012.

Aldersey-Williams, Hugh & Hall, Peter & Sargent, Ted & Antonelli, Paola (Ed.) (2008). *Design and the Elastic Mind*. New York: The Museum of Modern Art.

Abrams, Janet & Hall, Peter (2006). *Else/Where: Mapping New Cartographies of Networks and Territories*. Minneapolis: University of Minnesota Design Institute.

## GRADING STANDARDS (GRADUATE)

A	Work of exceptional quality
A-	Work of high quality
B+	Very good work
B	Good work; satisfies course requirements
Satisfactory completion of a course is considered to be a grade of B or higher.	
B-	Below-average work
C+	Less than adequate work
C	Well below average work
C-	Poor work; lowest possible passing grade
F	Failure
GM	Grade missing for an individual

Grades of D are not used in graduate level courses.

#### Grade of W

The grade of W may be issued by the Office of the Registrar to a student who officially withdraws from a course within the applicable deadline. There is no academic penalty, but the grade will appear on the student transcript. A grade of W may also be issued by an instructor to a graduate student (except at Parsons and Mannes) who has not completed course requirements nor arranged for an Incomplete.

#### Grade of WF

The grade of WF is issued by an instructor to a student (all undergraduates and all graduate students) who has not attended or not completed all required work in a course but did not officially withdraw before the withdrawal deadline. It differs from an "F," which would indicate that the student technically completed requirements but that the level of work did not qualify for a passing grade. The WF is equivalent to an F in calculating the grade point average (zero grade points), and no credit is awarded.

#### Grades of Incomplete

The grade of I, or temporary incomplete, may be granted to a student under unusual and extenuating circumstances, such as when the student's academic life is interrupted by a medical or personal emergency. This mark is not given automatically but only upon the student's request and at the discretion of the instructor. A Request for Incomplete form must be completed and signed by student and instructor. The time allowed for completion of the work and removal of the "I" mark will be set by the instructor with the following limitations: [You should include one the following standards, depending on the level of your course].

Work must be completed no later than one year following the end of the class. Grades of "I" not revised in the prescribed time will be recorded as a final grade of "WF" (for Parsons and Mannes graduate students) or "N" (for all other graduate students) by the Office of the Registrar. The grade of "N" does not affect the GPA but does indicate a permanent incomplete.

## CRITERIA FOR EVALUATION

### Communication

How well are the students able to express their ideas, both verbally and with other forms of communication such as: writing, drawing, mapping, modeling, and pre-visualization.

### Critical Thinking and Reflective Judgment

To what degree have the students demonstrated and developed critical thinking skills over the course of the semester? Reflective judgment not only asks the questions with concrete answers such as evaluative questions about form, methodology, materials, utility, aesthetics, cultural context, experience, research, and process critique, but also takes on difficult problems in the world that require research and evidence to support conclusions and advocacy.

### Design/Creative Processes

How do the students identify problems, brainstorm ideas, generate, analyze, and research solutions, write specifications and constraints, consider contextual factors, evaluate feasibility, test, iterate, evaluate process and form, integrate and adapt new processes, and pursue an iterative cycle?

### Contextualization, Conclusion and Evaluation

Have the students been able to connect their work and ideas to historical and contemporary precedents, and situate their work within the larger discourse surrounding ideas of data visualization? Can the students synthesize a problem and apply diverse approaches to design and visualization in support of a conclusion? Can the students evaluate project successes and failures?

### Integration and Appropriate Use of Technology

Are the students making good choices about the form and type of technology they are using to express her design concept? Are the students able to integrate technology into the conceptualization of their projects?

### Iteration, Production, Time Management

Are the students able to scale their project to the appropriate time frame within the technical and design resources at their disposal? Are the students recording their thoughts and processes on their website so that their knowledge can be shared with and discussed the rest of the class.

## DIVISIONAL, PROGRAM, AND CLASS POLICIES

### Responsibility

Students are responsible for all assignments, even if they are absent. Late assignments, failure to complete the assignments for class discussion and/or critique, and lack of preparedness for



in-class discussions, presentations and/or critiques will jeopardize your successful completion of this course.

### Participation

Class participation is an essential part of class and includes: keeping up with reading, assignments, projects, contributing meaningfully to class discussions, active participation in group work, and coming to class regularly and on time.

### Attendance

Faculty members may fail any student who is absent for a significant portion of class time. A significant portion of class time is defined as three absences for classes that meet once per week and four absences for classes that meet two or more times per week. During intensive summer sessions a significant portion of class time is defined as two absences. Lateness or early departure from class may also translate into one full absence.

### Canvas

Use of Canvas will be an important resource for this class. Students should check it for announcements before coming to class each week.

### Delay

In the rare instance that I may be delayed arriving to class, check Canvas for instructions for a minimum of thirty minutes.

### Electronic Devices

Use of electronic devices (phones, tablets, laptops) is permitted when the device is being used in relation to the course's work. All other uses are prohibited in the classroom and devices should be turned off before class starts.

### Academic Honesty and Integrity

The New School views "academic honesty and integrity" as the duty of every member of an academic community to claim authorship for his or her own work and only for that work, and to recognize the contributions of others accurately and completely. This obligation is fundamental to the integrity of intellectual debate, and creative and academic pursuits. Academic honesty and integrity includes accurate use of quotations, as well as appropriate and explicit citation of sources in instances of paraphrasing and describing ideas, or reporting on research findings or any aspect of the work of others (including that of faculty members and other students). Academic dishonesty results from infractions of this "accurate use". The standards of academic honesty and integrity, and citation of sources, apply to all forms of academic work, including submissions of drafts of final papers or projects. All members of the University community are expected to conduct themselves in accord with the standards of academic honesty and integrity. Please see the complete policy in the Parsons Catalog.

It is the responsibility of students to learn the procedures specific to their discipline for correctly and appropriately differentiating their own work from that of others. Compromising your academic integrity may lead to serious consequences, including (but not limited to) one or more of the following: failure of the assignment, failure of the course, academic warning, disciplinary probation, suspension from the university, or dismissal from the university.

*Student Disability Services (SDS)*

In keeping with the University's policy of providing equal access for students with disabilities, any student with a disability who needs academic accommodations is welcome to meet with me privately. All conversations will be kept confidential. Students requesting any accommodations will also need to meet with Jason Luchs in the Office of Student Disability Services, who will conduct an intake, and if appropriate, provide an academic accommodation notification letter to you to bring to me. SDS assists students with disabilities in need of academic and programmatic accommodations as required by the Americans with Disabilities Act of 1990 (ADA) and Section 504 of the Federal Rehabilitation Act of 1973.

<http://www.newschool.edu/student-services/disability/>.