**New York City College of Technology
The City University of New York

School of Technology and Design
Department of Architectural Technology** 

**ARCH 1205 – Interdisciplinary Information Design ID2**

**Course Description**

Every day, we are overloaded with a seemingly endless flow of information — social media feeds, news, advertising, emails, text messages. How do we know which information to pay attention to? Information design helps us navigate and understand our data-rich world. This interdisciplinary course explores how the information design process transforms data into meaning. Through hands-on, collaborative projects that highlight approaches from Computer Science, Communication Design, and Architecture, students will investigate the history and theory behind effective information design while employing user-centered practices.

2 lecture, 2 lab hrs, 3 cr

WI - Writing Intensive



 *Fig. 1. Minard’s* ***Napoleon’s March*** *is a strong example of a graphic that represents data over time.*

**Prerequisites:**

Pre- or Co-Requisite: ENG 1101

**Course Objectives**

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| **INSTRUCTIONAL OBJECTIVES** | **ASSESSMENT**  |
| **For the successful completion of this course, students should be able to:** | **Evaluation methods and criteria:** |
| Theory and Concept: Demonstrate knowledge of history and theory of information design | Demonstrate knowledge through research blog posts, reflective journal entries, and/or short quizzes and assignments  |
| Theory and Concept: Exhibit an understanding of different views and definitions of information and information design as well as between data, information, and knowledge | Visually and verbally express abstract concepts and feelings |
| Physical: Understand concepts related to storage, transfer, and retrieval of information  | Demonstrate knowledge through research blog posts, reflective journal entries, assignments, and/or short quizzes |
| Semantic: Understand principles of design for communication | Critique own work independently; develop and grow intellectually. Demonstrate knowledge through research blog posts, reflective journal entries, and/or assignments |
| Behavioral: Exhibit concepts of narrative, structure and storytelling –how information affects conduct  | Demonstrate knowledge through research blog posts, reflective journal entries, and assignments |
| Project Design: Conduct research that includes data and survey collection  | Demonstrate knowledge through organization and verbal communication for solving communication challenges |
| Project Design: Analyze, organize, and assess findings | Demonstrate knowledge through organization, visual storytelling, and verbal communication  |
| Project Design: Define, design, and deliver final project | Demonstrate knowledge through organization, visual storytelling, and verbal communication  |

**General Education Outcomes**

<https://facultycommons.citytech.cuny.edu/wp-content/uploads/2014/09/General-Education-Learning-Goals_March-2013.pdf>

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| **General Education Outcome:** | **How the outcome is covered:**  |
| **Oral Communication**Speaking: Demonstrate the ability to articulate ideas using relevant discipline-specific language | Evaluate through class discussion and critique, and presentations, if students use appropriate nomenclature to demonstrate creative, critical and technical decisions in project concepts and development |
| **Thinking Critically**Demonstrate the ability to evaluate evidence and apply reasoning to make valid inferences | Evaluate through class critique a determination of how well students were able to advance project concepts by applying evidence and using logic to make decisions |
| **Application**Manifest an ability to successfully apply concepts into both in-class and long-term assignments | Evaluate how well students absorbed and consequently applied the learning through oral and written critiques of projects |
| **Social Interaction**Demonstrate an understanding of professional ethics. | Evaluate through class discussion and written tests if students have developed a sensitivity and awareness of professional ethics. |

**Writing Intensive**

This course is designated “Writing Intensive.” Students will be writing every week, in class and on the OpenLab via weekly blog posts, peer-to-peer comments, and journal entries. Part of this practice will be presenting thoughtful reflections on their learning process in order to demonstrate a comprehension of relevant concepts. The instructor will provide timely feedback and guide students as they develop their project proposals and final presentations. Students will also submit critical written analyses of information design examples and readings leading to 1-2 page exploratory papers that use standard citation guidelines.

**Research Project**

The final project will cover material from lectures, class activities, weekly project work. Students will work in groups to implement data and research, explore tools, and create interactive design solutions that introduce the COMD, ARCH, CST Departments and the College to other students.

Deliverables: a final presentation that presents data, research, and a design solution/prototype

* **Data--** Find interesting data sets that tell a story, providing students a way to explore the three departments and City Tech.
* **Research--** Think about information design questions to improve an understanding of the similarities and differences between departments, as well as what knowledge would help improve students’ college experience. Then use these ideas to design research, gather, and analyze data.
* **Design Solution--** Building upon methods learned throughout the semester, explore creative information design solutions and present a prototype that communicates data to the audience

**Teaching/Learning Methods**

**The course will be co-taught with lectures from professors from the ARCH, COMD, and CST departments, as well as others periodically from disciplines that use data analytics, like the social sciences and math. Learning methods will include:**

* Lectures and readings
* Discussion and critiques
* OpenLab Discussion Posts/Comments
* Peer-to-peer critique
* Research Journal
* Examples / Reference
* Formal Presentations
* Class and individual projects

**Recommended Texts**

Meirelles, Isabel. *Design for Information : An Introduction to the Histories, Theories, and Best Practices Behind Effective Information Visualizations*, Quarto Publishing Group USA, 2013. *ProQuest Ebook Central*, <https://ebookcentral.proquest.com/lib/citytech-ebooks/detail.action?docID=3399922>.

Floridi, Luciano. *Information : A Very Short Introduction*, Oxford University Press, 2010. *ProQuest Ebook Central*, <https://ebookcentral.proquest.com/lib/citytech-ebooks/detail.action?docID=737413>.

Specific books, magazines, and periodicals will vary with selected assignments. Instructor will provide a materials list.

**Required Materials**

Sketchbook

External drive or Dropbox account

ArcGIS Online Account

**Grading**

All projects, homework, in-class assignments, and discussion posts will be graded assignments. Research, independent preparation, class participation, and verbal analysis of precedent information design work and concepts will also be taken into consideration. There will be no final examination.

**Grade Distribution**

The following grade scale is recommended for use in this course. The exact distribution of percentages will be determined by the individual section instructor.

In this writing-intensive course, students are expected to write between 20-30 pages in total.

Posts / Discussion Comments 20% (1 page weekly)

Exploratory Papers 15% (1-2 pages each)

Research Journal 10% (1 page weekly)

Research Project & Presentation 25% (2-3 pages)

Assignments 15%

Productivity & Participation 15%

**Academic Integrity Standards**

Students and all others who work with information, ideas, texts, images, music, inventions, and other intellectual property owe their audience and sources accuracy and honesty in using, crediting, and citing sources. As a community of intellectual and professional workers, the College recognizes its responsibility for providing instruction in information literacy and academic integrity, offering models of good practice, and responding vigilantly and appropriately to infractions of academic integrity. Accordingly, academic dishonesty is prohibited in The City University of New York and at New York City College of Technology and is punishable by penalties, including failing grades, suspension, and expulsion.

**Course Schedule**

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| **WEEK/****LEAD** | **LECTURE/ DEMO** | **ACTIVITY** | **PROJECT MILESTONES** |
| **1****CST/****ARCH** | **Theory and Concepts: The Information Society**Topics Covered: What is information? What is Information Design?Students will explore definitions of information and information design and an overview of the history of information.Readings: Floridi, Luciano. [Information : A Very Short Introduction](https://ebookcentral.proquest.com/lib/citytech-ebooks/detail.action?docID=737413), Oxford University Press, 2010. Chapter 1Gleick, James. The Information: A History, A Theory, A Flood. Pantheon Books, 2011. Introduction. McLuhan, Marshall. Understanding Media: The Extensions of Man. 1964. Ch. 1&2 | Review course syllabus; course project is introduced via mapping exercise to learn about the college and departments (ARCH, COMD, CST)Students identify at least three problematic areas in how the College currently attempts to orient new students to campus, and consider elements that could improve their experience. Are students presented with enough information to enable them to make informed decisions about study in following departments ARCH, COMD, CST | Students review and compare findings of mapping exercise; Students write in research journal, discussion posts and comments.  |
| 2 **CST** | **Theory and Concepts: Data vs. Information vs. Knowledge**Understanding dataQuantitative and qualitative data; Transforming data into information; using information to make decisions and/or take actions.Readings: Floridi, Luciano. [Information : A Very Short Introduction](https://ebookcentral.proquest.com/lib/citytech-ebooks/detail.action?docID=737413), Oxford University Press, 2010. Chapter 2Gleick, Ch. 3, 7 | Students create survey/interview each other; collect data about student knowledge of the college and specific departments (CST, COMD, ARCH).  | Organize findings into categories and using tools presented in class; Students write in research journal, discussion posts and comments. |
| 3**CST** | **Theory and Concepts**Representing / Encoding/Transforming Information for Storage and CommunicationOral languageWritten language.SymbolsCodesInformation transformations and mediaModels of CommunicationReadings: Floridi, Luciano. [Information : A Very Short Introduction](https://ebookcentral.proquest.com/lib/citytech-ebooks/detail.action?docID=737413), Oxford University Press, 2010. Chapter 3DuBois, WEB. Data Portraits: Visualizing Black America. | Students create survey/interview each other (continued); collect data about student knowledge of the college and specific departments (CST, COMD, ARCH).  | Organize findings into categories and using tools presented in class; Students add to research journal; submit discussion posts and comments. |
| 4**CST** |  **Physical**Information design for storage and retrieval:Text formats: -ASCII-UnicodeImage formats: -Raster and vector formats-Bit depth-Compression algorithms: lossless and lossyData architecture and patterns: SQL and noSQL databases; CSV files.Data structures: trees | 1. Students will download and use *hexdump* to view the binary representation of files2. Students will create a text file (with Notepad or TextEdit) and understand its ASCII representation in a computer with *hexdump*.3. Students will create a PNG file (with [www.pixilart.com](http://www.pixilart.com)) and understand its binary representation in a computer with *hexdump*. | Students will design strategies to store the data that they are collecting and analyzing for the project.Students will analyze the representation of data files created for the project in electronic media.Students add to research journal; submit discussion posts and comments. |
| 5**CST** | **Physical** Information design for communication:-Converting a message to a signal: packets, headers and trailers-Signals and noise: error detection and correction codes (redundancies)-Communication channel capacityInformation design for privacy:-Brief history of ciphers-Privacy over the internet: public key encryption. | 1. Students will encrypt simple messages using the Cesar cypher.2. Students will read *The Gold Bug* by E. A. Poe and decode the cryptogram at the core of the story.3. Using a Network analyzer, students will understand how information is transferred reliably over a network.4. Students will understand the need of encryption for private communications. | Students compose a 1-2 page exploratory essay on topic related to concepts of Physical Information |
| 6**Guest** **Lecturer:****Social****Sciences** | **Behavioral/Ethics**(to be assigned guest lecturer from the social sciences)Precedent lectureDemographics, City Data, College Data (Precedents) | Students review (analyze) information they have collected from interviews and survey (week 1 and 2) * What conclusions can they make?
* What questions do they have?

Organize their findings and make available to the entire class.  | Students add to research journal; submit discussion posts and comments. |
| 7**ARCH** | **Behavioral/Ethics** (ibid) Story tellingHow to recognize patterns in information? And build a story. | Mid-Term:Presentations: Students present the Data they collected and share with the class how it has been stored and made available to all. | Students compose a 1-2 page exploratory essay on topic related to Behavioral Design |
| 8**ARCH** | **Semantic/Design**Qualitative Vs. Quantitative Exploration of four categories of graphic representation to help organize and structure quantitative information in ways that make concepts easier to understand.1. Inform: convey a single data point
2. Compare: categorical data
3. Transform: over time or location
4. Organize: arranging content by groupings, rankings, or process

Readings: Meirelles, Isabel | From the interviews and survey (week 1 and 2) distinguish what isQualitative Vs. QuantitativeStudents review the following website: <https://datavizcatalogue.com/search.html>Select a minimum of three charts that best visualize their findings from the interviews and survey (week 1 and 2)  | Students add to research journal; submit discussion posts and comments. |
| 9**ARCH/****COMD** | **Semantic/Design** Exploring the role of type in establishing a visual hierarchy. And an overview of the principles of design and their impact on visual perception. 1. Repetition2. Emphasis 3. Balance4. Proximity/Unity 5. Proportion 6. AlignmentReadings: Meirelles, Isabel | Intro to ArcGisexplore concepts of hierarchy of Information and related design decision making i.e. color palettes, type choices, etc. | Students compose a 1-2 page exploratory essay on topic related to Semantic Information |
| 10**COMD** | **Examples of types of media and tools**Introduction to Cartography via ArcGIS Online-locating places with geospatial coordinates-attaching data to maps with shape files-Visualizing data on maps with  - color, transparency, text, layers, and pop-up layers, symbols | In Class Project:-Create a map of the campus for a scavenger hunt-create symbols for different places on campus | Students add to research journal; submit discussion posts and comments. |
| 11**COMD** | **Examples of types of media and tools**Introduction to Tableau– visualizing analysis of data |  | Students add to research journal; submit discussion posts and comments. |
| 12**COMD** | **Project/Presentation work**Final project: students will work in groups drawing from the prior weeks’ material to implement data, research, explore tools, and create interactive design solutions that introduce COMD, ARCH, CST and the college to other students. Final presentation should: 1. Site what is currently lacking in enabling new students to make informed decisions about their choice of study during orientation.2. present a persuasive proposal with suggestions for addressing these inadequacies.  | Students start the first phase of their final project: **Research**. This is an opportunity to collect as much literature as possible related to student orientation; Catalog, Welcome Center, City Tech Website, Departments, Demographics, and collect additional information that can help inform, and support the final presentation.**Research-** This is an opportunity to think about information design questions to understand the similarities and differences between departments and what information would help improve students’ college experience.  | Students add to research journal; submit discussion posts and comments. |
| 13**COMD** | **Project/Presentation work**. Examination of findings from research in phase one. Sort data by:-Compare and contrast Departments -Categorize Physical resources vs. Digital resources | Continuing onto the second phase of the final project: **Data**. Students will use their research to examine and sort specific findings that would enable new students to make informed decisions about their choice of study during orientation. **Data-** Analyze interesting data sets that tell a story, providing students a way to explore the 3 departments and City Tech.  | Students add to research journal; submit discussion posts and comments. |
| 14**COMD** | **Project/Presentation work**This is the time to use the multiple methods that were discussed throughout the semester, create engaging creative solutions and visuals to help support a proposal and suggestions for addressing the diferent inadequacies. | In the third phase: Design Solution, students will take different creative approaches and plan visuals that present data in a friendly way that would be easily understood – using graphics packages, videos, AR, maps, and any visual aid. | Research Project:* Pinup reviews and discussions

Students add to research journal; submit discussion posts and comments. |
| 15**COMD****ARCH****CST** | **Final Presentations**Presentation Day showcasing the process:1. Research
2. Data
3. Design Solution and Prototype
 | Final presentation must find solutions to or provide suggestions for better informing new students and improving the overall orientation experience at CityTech.  |   |

**Bibliography**

Chandra, Vikram. *Geek Sublime: The Beauty of Code, The Code of Beauty.* Graywolf Press. 2014.

Charles, Daniel. “Do Maps Have Morals?” *MIT Technology Review*, 2 Apr. 2020,<https://www.technologyreview.com/2005/06/01/101244/do>-maps-have-morals/.

Christiansen, Jen. “Visualizing Science: Illustration and Beyond.” *Scientific American*, October 25, 2018.

Christiansen, Jen. “Illustrating Complex Science Stories,” (Chapter 11)<https://ksjhandbook.org/illustrating-complex-science-stories/>

Cukier, Kenneth and Viktor Mayer-Schonberger. *Big Data: A Revolution that Will Transform How We Live, Work, and Think*. Hodder and Stoughton. 2013.

Du Bois, W. E. B. *Data Portraits: Visualizing Black America*

Floridi, Luciano. *Information : A Very Short Introduction,* Oxford University Press, 2010.ProQuest Ebook Central,https://ebookcentral.proquest.com/lib/citytech-ebooks/detail.action?docID=737413.

Fresques, Hannah. “Visualizing Data” Data Institute 2018. *ProPublica,* October 1, 2018.(ProPublica)

Friendly, Michael. “Milestones in the History of Thematic Cartography, Statistical Graphics,and Data Visualization,” (Introduction, pp 1-3 ) Oct. 16, 2018.(Math.USA.Edu)

Gleick, James.*The Information: A History, a Theory, a Flood*. Fourth Estate, 2012.

Grimwade, John. “Maps Revisited” Ohio University,May 21, 2019. (VisCom at OhioUniversity)

Grimwade, John. “The Infographic Family”Ohio University,October 17, 2018. (VisCom atOhio University)

Hillery, Allen. “How Vignelli’s Design Still Influences NYC’s Subway Maps Today” *Medium,* Jul 25, 2019.

Koponen, Juuso and Jonatan Hildén. Data Visualization Handbook. Aalto University Press, 2019.

Lauren. Robert. “The 34 Best Interactive Data Visualizations from the New York Times” *Dolphins*, February 28, 2018.

Lucas, Jake. “Meet Amanda Cox, Who Brings Life to Data on Our Pages” *New York Times,*February, 28, 2019.

McLuhan, Marshall. *Understanding Media: The Extensions of Man*. MIT Press. 1994.

Meirelles, Isabel. *Design for Information :An Introduction to the Histories, Theories, and BestPractices Behind Effective Information Visualizations*, Quarto Publishing Group USA, 2013.ProQuest Ebook Central,https://ebookcentral.proquest.com/lib/citytech-ebooks/detail.action?docID=3399922.

Rendgen, Sandra, and Julius Wiedemann. *History of Information Graphics*.TASCHEN, 2019.

Tufte, Edward*. Envisioning Information*. 2nd ed. Graphics Press, 2018.

Tufte, Edward *The Visual Display of Quantitative Information*. Cheshire,Connecticut: Graphics Press. 1983. (ISBN0961392142.4)

Ware, Colin. *Information Visualizations.* Morgan Kaufman, 4th ed. 2020.

White, Richard. “What is Spatial History” February 1, 2010.(web.stanford.edu)