

ADES 5450 – DATA AND INFORMATION VISUALIZATION AND DESIGN

Instructor: Michael R. Gibson, Associate Professor

*Office Hours:*TBD

Course Description

This course emphasizes understanding and learning to utilize design-centric, conceptual and method-based approaches to guide the development, formal realization and functionality of interactive information systems, graphic displays and instructions. The design-based knowledge students will construct will guide their creation of user-centered, interactive, data visualizations and information design structures on behalf of specific audiences working within particular scenarios of use. Students will also learn to design visually communicative depictions of sequential and time-based data that helps audiences make effective comparisons between and derive contextualized understandings from key concepts and patterns at work within this data.

Prerequisites (for MA in Des w/ Con in IXD students): ADES 5410, ADES 5420; (for Com Sci students): permission of the instructor

Required Texts

Krum, R. (2013). *Cool Infographics: Effective Communication with Data Visualization and Design*. NY, NY, USA: Wiley

Meirelles, I. (2013). *Design for Information*. Beverly, MA, USA: Rockport Publishers.

Tufte, E. (1997). *Visual Explanations, Images and Quantities, Evidence and Narrative*. Cheshire, CT, USA: Graphics Press.

Recommended Texts

Few, S. (2009). *Now You See It: Simple Visualization Techniques for Quantitative Analysis*. Oakland, CA, USA: Analytics Press

Course Objectives

Through the completion of course assignments, *students will acquire competency in the following areas:*

- The ability to effectively analyze common data domains—text, cartography, networks, multivariate data—to discern essential patterns and relationships that could guide the development of particular data visualizations
- The ability to these interpretations of patterns and relationships from particular data domains to guide the development of data visualizations that function as analytical tools on behalf of given audiences
- Practical experience using iteratively structured design processes to create effective data visualizations from initial idea generation and rough-sketching to final realization as interactive entities
- Practical experience using visual narrative/visual storytelling principles and techniques to guide the design of effectively communicative data visualizations
- Practical experience using (primarily) HTML, CSS, Tableau (or R) and D3 to create web-based, interactive data visualizations

Through the completion of course assignments, *students will develop competency in the following areas:*

- Develop the capacities and competencies necessary to engage in visualization as both a means to a) *explore* relationships and patterns contained within data and as b) a means to *explain* these to a specific audience
- Understandings of how to iteratively structure, represent and communicate information across different media platforms in ways that allow periodic assessment by sample, persona-based users to affect design development
- Classifying information gleaned from data according to the following six structural rubrics: Hierarchical, Relational, Temporal, Spatial, Spatio-Temporal, and Textural
- The ability to iteratively design representative data sets that lack inherent spatial components in physical forms such as statistical charts, graphs, maps and diagrams
- The ability to iteratively design informational graphics in ways that combine various statistical expressions and visualizations with some form of narrative (including those are normative or polemic in nature)

Through the completion of course assignments, *students will continue to develop competency in the following areas:*

- Conceptual development, testing, revising, re-testing and implementing interactive design experiences
- The user-centered design process, and documentation and effective reportage of this
- Contextual inquiry-based approaches and methods for framing problematic interactive experiences
- Oral, written and graphic presentation and skills, combined with the ability to effectively pitch new ideas

- Interior project types including but not limited to corporate, hospitality, retail, healthcare, and residential
- Interior project scope requirements including but not limited to construction documents and working drawings (CD's), and furniture, furnishings, and equipment specifications (FF&E)
- Building codes and barrier-free requirements
- Interior building systems and interior environmental quality components including but not limited to wall systems, lighting systems, acoustics, wayfinding and surface treatments
- Sustainability and green design issues; universal design; sensory design
- Personal ethics and social responsibility

Course Structure

This course is offered in a design studiolab format, and will meet for two, two-hour class sessions per week (four contact hours per week total). Course content and studiolab etiquette during critically dialectic exchanges between fellow-students and students and faculty are all consistent with the requirements of pursuing a career in professional User Experience and Interaction Design environments. Students will schedule and facilitate user testing sessions with target user groups in person and remotely as necessary to analyze and assess responses as a means to inform design decision-making as they develop specific data visualization prototypes. Students will work in the studiolab as required, and participate in class discussions and critical dialogues during class hours. Students will submit their work on assigned course projects in iterative phases as stipulated by a per-project development schedule. The CVAD Computer Lab, the computing facilities in room 315 of Curry Hall and the Design Research Collaborative in Dallas, and the data visualization and simulation lab in the UNT New College at Frisco are available to students to work on assigned course projects outside of scheduled class time.

Evaluation

Each assigned project will be worth a specific number of total course points to individual students or students working in design teams. Each assigned project will be evaluated according to criteria articulated to all students on the day it is launched. How effectively each student/student team is assessed to have addressed specific project criteria will be recorded on an assessment document that each student will receive one to two weeks after the culmination of each project. The per-project course points each student earns as the semester progresses will be added together at the end of the semester to determine that student's final course grade. A final project and final project presentation must be completed by the final exam date and time for this course. There is no final exam for this course.

Project I	Identification of key design principles	5%
Project II	Discerning "principle narratives" from processes of data analysis	10%
Project III	Actuation of key design principles	15%
Project IV	Making effective marriages between key design principles and principle narratives	25%
Phase V	Using prototypes to facilitate useful and usable user feedback	10%
Phase VI	Final course project and presentation	35%

Attendance Policy

Attendance is mandatory. Students must sign the attendance sheet during the first (15) minutes of class. No student may sign for another. Every unexcused absence over two will result in a letter grade reduction of the final course grade beginning with the third unexcused absence. Each two instances of tardiness over an initial two of these will be counted as one absence. A student is tardy if he/she arrives after the first 15 minutes of class have elapsed. No make-up opportunities for a missed class session will be given to any student enrolled in this course *unless* that student presents the professor with a UNT-Approved Absence Verification form within 72 hours of the ending of the class session that was missed. Students are hereby notified that meeting with the Instructor of Record for this course during an office hours session does NOT make up/cannot be substituted for a class session that was missed.

Course Risk Factor

This class has been assigned a level 1 Risk Rating, a course in which students are exposed to some minor hazards (most particularly, repeated computer usage), but are not likely to suffer bodily harm.

American Disabilities Act

The College of Visual Arts and Design is committed to full academic access for all qualified students, including those with disabilities. In keeping with this commitment and in order to facilitate equality of educational access, faculty members in the College will execute reasonable accommodations for qualified students with a disability, such as making appropriate adjustments to the classroom environment, as well as to the teaching, testing, or learning methodologies

that are operated within the structure of the course, as long as actuating any of these adjustments does not fundamentally alter the content that must be delivered within the structure of the course.

If you have a disability, it is your responsibility to obtain verifying information from the Office of Disability Accommodation (ODA; <https://disability.unt.edu/>), and to inform the instructor of your need for an accommodation. Requests for accommodation must be given to the instructor no later than 5 pm CST on the final day of the first week of classes for students registered with the ODA as of the beginning of the current semester. If you register with the ODA after the first week of classes, your accommodation requests will be considered after this deadline.

Grades assigned before an accommodation is provided will not be changed. Information about how to obtain academic accommodations can be found in UNT Policy 18.1.14, at <https://disability.unt.edu/>, and by visiting the ODA in Sage Hall on the UNT Denton campus, room 167 (visit the UNT website for updated location information). You also may call the ODA at 940.565.4323.

Building Emergency Procedures

In case of emergency, an alarm will sound. If this occurs, please follow the building evacuation plans posted on each floor of your building and proceed to the nearest parking lot. In case of a tornado (campus sirens will sound), or other weather-related threat, please go to the nearest hallway or room on your floor *without exterior windows* and remain there until an all clear signal is sounded. Follow the instructions of your instructors and act accordingly.

Student Rights and Responsibilities

Each University of North Texas student is entitled to certain rights associated with higher education institutions. See www.unt.edu/csrr for further information.

Disclaimer

The instructor retains the right to change the course syllabus and schedule without notice.