Course Outline

This outline provides an overview of the course and assignments by week. Please remember to check the calendar for specific due dates. Each course module runs for a period of seven (7) days, i.e., one week.

Module	Dates	Topics	Assignments
Module 1	Tu 09/01/2020 –Mon 09/07/2020	Introduction to Data Visualization	**New:** • Reading #1: Tufte, *"Visual and Statistical Thinking: Displays of Evidence for Making Decisions*" • Reading #2: Robinson et al., "*Representation and Misrepresentation: Tufte and the Morton Thiokol Engineers on the Challenge*" • Create Blackboard online profile • Online Discussion #1: Launch of the Challenger • **Project #1:** Visualization Critique
Module 2	Tu 09/08/2020 –Mon 09/14/2020	Introduction to Visualization Techniques	**New:** • Readings #1: Chapter 1 of *"Readings in Information Visualization: Using Vision to Think"*, Card, Mackinlay, and Shneiderman • Online Discussion #2: Find and describe and effective visualization **Due:** • Student Intro • Online Discussion #1
Module 3	Tu 09/15/2020 –Mon 09/21/2020	Human Visual Perception	**New:** • Readings #1: Healey et al. "*Attention and Visual Memory in Visualization*", IEEE TVCG, 18(7), July 2012 • Discussion: Find and describe an optical illusion • **Project #2:** Data Exploration and Design **Due:** • **Project #1:** Visualization Critique • Online Discussion #2
Module 4	Tu 09/22/2020 –Mon 09/28/2020	Visualization Design Principles	**New:** • Readings #1: Chapter 4: "*Data-Ink and Graphical Redesign"*, In The Visual Display of Quantitative Information. Tufte • Discussion: Provide links of Tutorials about how to use Tableau **Due:** • **Project #1:** Critique visualization used by a classmate in Project #1 • Online Discussion #3

Module	Dates	Topics	Assignments
Module 5	Tu 09/29/2020 –Mon 10/05/2020	Color in Visualization	**New:** • Readings #1: Maureen Stone: "*Choosing Colors for Data Visualization*", • Reading #2: Brewer, C. A. 1999. *"Color Use Guidelines for Data Representation*", Proceedings of the Section on Statistical Graphics, American Statistical Association • Discussion: Color • **Project #3:** Interactive Visualization using Tableau • **Project proposal announced** **Due:** • **Project #2:** Data Exploration and Design • Online Discussion #4
Module 6	Tu 10/06/2020 –Mon 10/12/2020	Interactive Visualization	**New:** • Readings #1: Ji Soo Yi et al. "*Toward a Deeper Understanding of the Role of Interaction in Information Visualization*", IEEE Transactions on Visualization and Computer Graphics 2007 • Discussion: Link to visualizations with interactions **Due:** • Online Discussion #5
Module 7	Tu 10/13/2020 –Mon 10/19/2020	Trees, Graphs, and Network Visualization	**New:** • **Readings #1:** *"Graph Visualization and Navigation in Information Visualization: A Survey".* Ivan Herman, Guy Melancon, M. Scott Marshall. IEEE Transactions on Visualization and Computer Graphics, 2000. • **Reading #2:** "Hierarchical Edge Bundles: Visualization of Adjacency Relations in Hierarchical Data". Danny Holten. InfoVis 2006 • **Discussion:** Provide links to tutorials about how to use D3 • **Project #4:** Interactive Visualization using D3 or R Shiny **Due:** • **Project #3:** Interactive Visualization using Tableau • Online Discussion #6

Module	Dates	Topics	Assignments
Module 8	Tu 10/20/2020 –Mon 10/26/2020	Maps and Cartography Visualization	**New:** • **Reading #1:** "Spatial Structures: Maps" (Chapter #4) in "Design for Information: An Introduction to the Histories, Theories, and Best Practices Behind Effective Information Visualizations", Isabel Meirelles, 2013 • **Reading #2:** Madhavan, J., Balakrishnan, S., Brisbin, K., Gonzalez, H., Gupta, N., Halevy, A. Y., ... & McChesney, R. (2012). Big Data Storytelling Through Interactive Maps. IEEE Data Eng. Bull., 35(2), 46-54. • **Reading #3:** Dykes, J., Wood, J. & Slingsby, A. (2010). Rethinking map legends with visualization. IEEE Transactions on Visualization and Computer Graphics, 16(6), pp. 890-899. • **Discussion:** Map Projectors and Cartography - Applications **Due:** • **Project Proposal Due** • Online Discussion #7
Module 9	Tu 10/27/2020 –Mon 11/02/2020	Text Visualization	**New:** • **Reading #1:** Textual Structures" (Chapter #6) in "Design for Information: An Introduction to the Histories, Theories, and Best Practices Behind Effective Information Visualizations", Isabel Meirelles, 2013 • **Reading #2:** Information Visualization for Text Analysis • **Reading #3:** Kostiantyn Kucher and Andreas Kerren. "Text visualization techniques: Taxonomy, visual survey, and community insights", IEEE Pacific Visualization Symposium (PacificVis), 2015 • **Bibliography Announced** • **Revised Project Announced** • **Discussion:** Describe a text analysis visualization tool **Due:** • Online Discussion #8

Module	Dates	Topics	Assignments
Module 10	Tu 11/03/2020 –Mon 11/09/2020	Temporal Visualization	**New:** • **Readings #1:** "Temporal Structures: Timelines and Flows" (Chapter #3) in "Design for Information: An Introduction to the Histories, Theories, and Best Practices Behind Effective Information Visualizations", Isabel Meirelles, 2013 • **Reading #2:** "Spatio-Temporal Structures" (Chapter #5) in "Design for Information: An Introduction to the Histories, Theories, and Best Practices Behind Effective Information Visualizations", Isabel Meirelles, 2013 • Discussion: Share Paraview tutorial • **Project #5:** Scientific Visualization using ParaView **Due:** • **Project #4:** Interactive Visualization using D3 • **Revised Project proposal due** • Discussion #9
Module 11	Tu 11/10/2020 –Mon 11/16/2020	Scientific Visualization	**New:** • **Readings #1**: Arie Kaufman and Klaus Mueller, "Overview of volume rendering", (Chapter 7) in The Visualization Handbook by Charles D. Hansen and Chris R. Johnson 2011 • **Discussion:** Share samples of scientific visualizations **Due:** • Online Discussion #10
Module 12	Tu 11/17/2020 –Mon 11/30/2020	Scientific Visualization II	**New:** • **Readings #1**: Arie Kaufman and Klaus Mueller, "Overview of volume rendering", (Chapter 7) in The Visualization Handbook by Charles D. Hansen and Chris R. Johnson 2011 • **Discussion:** Share sample 3D datasets **Due:** • Online Discussion #11 • **Bibliography due**
Mon 11/23/2020 – Sun 11/29/2020	Fall Break		
Module 13	Tu 12/01/2020 –Mon 12/07/2020	Isosurfaces and Flow Visualization	**New:** • **Readings #1**: J. Thomas and K. Cook, Illuminating the Path - The Research and Development Agenda for Visual Analytics, IEEE Press, 2005 • **Discussion:** Share link to online visual analytics tool **Due:** • Online discussion #12 • **Project #5 due:** Scientific Visualization using ParaView

Module	Dates	Topics	Assignments
Module 14	Tu 12/08/2020 –Mon 12/14/2020	Display Systems and Evaluation	**New:** • **Reading #1:** S. Carpendale, "Evaluating Information Visualizations", in Information Visualization: Human-Centered Issues and Perspectives **Due:** • Online Discussion #13 • **Final Project Due**