



Data Visualization

SHORT COURSE DESCRIPTION

This course explores the field of data visualization. Topics cover the expanse of visualization from data preparation and cleaning to visualization types such as time-series, box plots, and violin plots. Included in our study are visualization tools, online interactive visualizations, and other issues related to the display of big data.

READING MATERIALS

Reading materials will be provided in advance during the course. All the lecture notes and other course materials will be provided in the class. Background readings include:

1. The Truthful Art: Data, Charts, and Maps for Communications, Alberto Cairo, 1st Edition, New Riders, ISBN-10: 0321934075
2. Interactive Data Visualization for the Web: An Introduction to Designing with D3, Scott Murray, 2nd Edition, O'Reilly Media, ISBN-10: 1491921289

COURSE REQUIREMENTS AND GRADING

This course consists of readings, tutorials, and hands-on visualization activities. Students will be exposed to readings, videos, and tutorials on key principles and concepts within the field of data visualization. Students are then asked to apply these concepts in a variety of hands-on activities.

To obtain a deep understanding of data visualization it is imperative that students create and explore their own visualizations. To this end, we will use several programming languages and visualization tools in this course. No prior understanding of programming is required. Visualizations for this course require a minimal amount of programming, which will be covered in tutorials, examples, and readings. Moreover, all visualization tools used in this course are freely available on the Web.

Grading will be done as follows:

Discussion Forum:	28%
Assignment:	42%
Final Analysis Presentation:	20%
Attendance & Participation:	10%

[All ISS classes are pass/fail based on the student academic achievement evaluated by grades on a scale of 100 points (grade of 60 or above is Pass). **SKKU regulations require students to attend at least 80% of all classes.**]

COURSE SCHEDULE

– WEEK I –

Day 1. Monday (27 June)

Why Data Visualization?
The Five Qualities of Great Visualization
Discussion Forum 1

Day 2. Tuesday (28 June)

The Truth Continuum

Assignment 1: Visualization Critique

Day 3 . Wednesday (29 June)

Truthfulness: Of Conjectures and Uncertainty
Discussion Forum 2 – Box Whisker Plot

Day 4. Thursday (30 June)

Principles of Data Visualization
Assignment 2: School System Box Plot Activity

– WEEK II –

Day 5. Monday (4 July)

Know Your Data: Exploring Data with Simple Charts

Day 6. Tuesday (5 July)

Visualizing Distributions
Assignment 3: Visualization Tools Paper

Day 7. Wednesday (6 July)

Tools for Data Visualization Introducing tools for visualization
R, D3, Tableau, Gplot2, HiCharts, Echarts
Discussion Forum 3: D3

Day 8. Thursday (7 July)

Revealing Changes
Assignment 4: R Activity – Violin Plot

– WEEK III –

Day 9. Monday (11 July)

Online and Interactive Visualizations Web Basics: HTML, CSS, JavaScript

Day 10. Tuesday (12 July)

Creating Online and Interactive Visualizations
D3: Interactive Data Visualization for the Web
Assignment 5: D3 Visualization Activity

Day 11. Wednesday (13 July)

More D3 Hands On
Discussion Forum 4: Discussion on TED Talks

Day 12. Thursday (14 July)

Additional Data Considerations: Uncertainty and Significance

Day 13. Friday (15 July)

Additional Data Considerations: Seeing Relationships
Assignment 6: Confidence Intervals Activity

– WEEK IV–

Day 14. Monday (18 July)

Advanced Data Considerations: Mapping Data

Day 15. Tuesday (19 July)

Final Presentation: Analysis of School System Data