CIV 355 - Data Analytics for Civil Engineering Systems

Current Catalog Description: An introduction to the fundamentals of descriptive and predictive analytics. Basic methods, models, and tools of data analytics for analyzing, understanding, and managing civil engineering systems in a data-driven approach

Prerequisite: CIV 305

Corequisite: None

Textbooks and/or Other Required Material: Required Texts:
No textbook is required.
Microsoft Excel, R.

This course is: Not Required

Topics Covered:
1. An introduction to data analytics in civil engineering
2. Data description
3. Data visualization
4. Modeling uncertainty using probability
5. Statistical inferences
6. Monte Carlo simulation
7. Regression analysis
8. Time series analysis
9. Clustering
10. Classification

Course Learning and Student Outcomes:

Course Learning Objectives	ABET Student Outcomes
Understand any given problem of study in the civil engineering context and from the perspective of data analytics	1
Identify appropriate methods of data analysis, formulate the solution approach, collect new data or select existing data, and prepare the data for analysis;	1
Perform data exploration, data description, data visualization, and data mining to develop an understanding of data;	6
Train, validate, and test predictive models to build the ability to predict or estimate the system measurements of interest;	6
Summarize and interpret analysis results to develop the final recommendation for system improvement.	3, 6

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