

**Fall 2024**  
**EE520 Data Driven Analysis of Complex Systems**  
**Data Science for Science**

**Syllabus**

Professor Erik M. Bollt  
**Office:** Camp 322      **e-mail:** [bolltem@clarkson.edu](mailto:bolltem@clarkson.edu)  
**Web:** [www.clarkson.edu/~bolltem](http://www.clarkson.edu/~bolltem)

**Course Texts:**

1. Notes in Development.

The goal of this course will be an integration of concepts of complex systems with big data analysis. Methodology will be drawn from, statistical and Bayesian analysis, time-frequency analysis, image processing, linear algebra and principal component analysis, graph theory, transfer operators, machine learning and image recognition, dimensionality reduction for dynamical systems, system identification, data assimilation, compressed sensing, and equation free modeling. Applications may include PDEs such as advection diffusion from atmospheric data and also steady flow, networked and social data-sets, feature identification in neurological applications, music analysis and identification, and image denoising.

**On the Web:** At my website, [www.clarkson.edu/~bolltem](http://www.clarkson.edu/~bolltem), I will regularly post useful information about the class, such as homework info, and updates to the syllabus.

**Grading.** Listed below are the items I will be using to evaluate your progress this semester.

Homework and projects: 100%

Homework and projects will include data and the codes you produce to process data. They will be judged based on the technical quality, the presentation quality including the written word, graphs, tables, and included calculations, and also the reference to codes. In other words, they will be judged in the same manner as any professional technical work. Also, besides the written quality of the work, you may be asked on occasion to present the work, orally.

I encourage you to browse the web but be careful what you read and be especially careful what is generated from AI Chatbots including ChatGPT. These do an excellent job of assembling gobbly-dee-goob that sounds good until you actually think as you read. And certainly do not hand in anything generated by these software.

Attending the lectures is required; a significant number of unexcused absences will result in downward adjustment of your grade.

