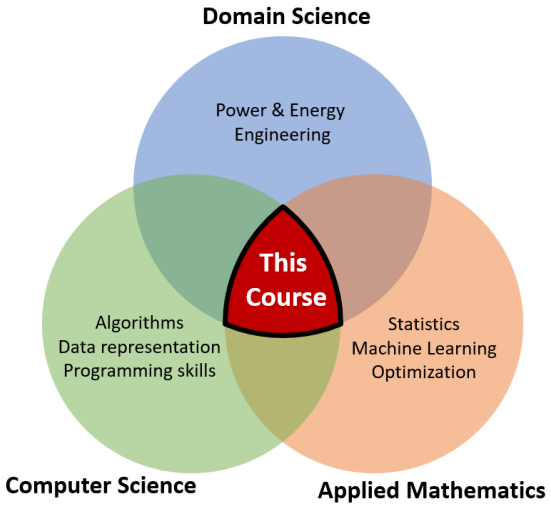
RUTGERS
School of Engineering
DEPARTMENT OF INDUSTRIAL AND SYSTEMS ENGINEERING

540:559 - Energy Markets and Data Analytics

Classroom COR-104, Lectures Wednesday 6:00 -9:00pm

Instructor: Robert Mieth

This course will teach fundamental methods of data analytics for applications in modern power and energy systems. It covers aspects of the high-interest topics **renewable energy** and **machine learning.** The first part of the course provides an overview of energy system operations and markets, as well as relevant statistical methods for data-driven decision making. The second part of the course focuses on prediction and forecasting methods specific to energy markets and investments in energy infrastructure. We will also touch upon topics related to data markets and data privacy.



Tentative schedule:

Week	Dates	Topic
0	1/17	Introduction and course overview Energy system organization and the role of data
1	1/24	Electricity markets I
2	1/31	Electricity markets II
3	2/7	The smart grid I
4	2/14	The smart grid II
5	2/21	Statistical inference (for control and equipment reliability)
6	2/28	Risk analysis (for power system operations and investments)
M	3/6	Mid Term
SB	3/13	>> Spring Break <<
7	3/20	Machine learning fundamentals I
8	3/27	Machine learning fundamentals II
9	4/3	Forecasting in power and energy systems I
10	4/10	Forecasting in power and energy systems II
11	4/17	Uncertainty quantification
12	4/24	Aspects of data privacy in power systems (if time permits)
F		Finals

Organization: Lecture, Weekly reading with mini assignments (10%), Project (40%), Mid-term (25% – part of mid-term will be related to the project), Final (25%).

Attendance: For students that are enrolled in a regular program (540:559:01) this is an *in-person* course. For students enrolled in an online (540:559:90) program, this course is available with weekly recordings of the lecture and online exams.

Prerequisites: The lectures will assume a fundamental knowledge of linear algebra and optimization methods. Some basic Python skills are useful.

Questions: Contact the instructor robert.mieth@rutgers.edu with any questions that you may have.