

JEE 688 Data Science for Environmental and Energy Studies
(Semester 2/2023)

Course Description

To introduce essential elements of data science and its ecosystem, as motivated by their significance and utility in today-world applications, including environmental and energy issues. The course is designed to prepare students to be equipped not only with basic knowledge but initial familiarity to certain data tools and open data to necessarily enhance their academic research and future career. The backbone of the course is dedicated to data analytics and predictive modeling. Real-world data-related applications are illustrated for additional perspectives.

Level: Basic, **Pre-requisite:** None, **Teaching:** Hybrid (mostly through Zoom but some on-sites)

Lecture time: Tuesday (starting 930am)

Onsite: Project room, Floo 4, SBT (or A3) Building, KMUTT (Bang Khun Thian Campus)

Main instructor: Assoc. Prof. Dr. Kasemsan Manomaiphiboon (kasemsanm@hotmail.com)

Tentative lectures (subject to future adjustment)

Lecture	Instructor
Lecture 1-2: Introduction / Data world, big data, & space-based data	Kasemsan
Lecture 3: Space-time convention and data format	Kasemsan
Lecture 4: R, Python, and QGIS in a very nutshell	TBD
Lecture 5: Exploratory data analysis I	Kasemsan
Lecture 5: Exploratory data analysis 6	Kasemsan
Lecture 7: Basic statistics	TBD
Lecture 8: Feature engineering I	Kasemsan
Lecture 9: Feature engineering II	Kasemsan
Lecture 10: Time series	Kasemsan
Lecture 11: Database and query	TBD
Lecture 12: Statistical modeling + AI & machine learning I	TBD
Lecture 13: Statistical modeling + AI & machine learning II	TBD
Lecture 14-15: Topic of interest	TBD
Lecture 16: Mini class project submitted and examination	Kasemsan

Evaluation

- a. Take-home examination, given in the end of Module 2 (60%)
- b. Mini class project submitted in the end of Module 2 (30%)
- c. Class participation throughout the semester (10%)

Resources

- a. Lecture notes in Dropbox
- b. Many free online books