ECON 4810 Selected Topics in Economics I
(Introduction to Machine Learning Methods in Economics)

Tue 1:30pm-2:15pm
Thu 10:30am-12:15pm

Instructor: Vinci Chow (vincichow@cuhk.edu.hk)
Office hours: By appointment (https://www.econ.cuhk.edu.hk/booked/Web/schedule.php?sid=2)
Teaching Assistant: TBA

Purpose of this Course

This course introduces machine learning methods commonly used in analyzing data, with an emphasis on how these methods can be applied to economic analysis. Students are recommended to have knowledge of basic statistics and regression analysis before taking this course.

This course can be re-designated as ECON 4130 to fulfill the Data Analytics concentration requirement.

Learning Outcomes

After completing this course, the student should understand the common machine learning techniques used in analyzing data. They should also be able to use Python to collect data and conduct analysis.

Textbook

There is no mandatory textbook. Course materials will be designed and compiled by the instructor.

Recommended Reading: Hastie, Trevor, Robert Tibshirani and Jerome Friedman (2016) The Elements of Statistical Learning.

Python

We will frequently use the Python programming language to solve mathematical problems in class. We will use the Anaconda Scientific Python Distribution for Python 3.8 (https://www.anaconda.com/download/), which supports all major operating system platforms. You have the option of using the online installation managed by the Department (http://scrp.econ.cuhk.edu.hk) or using your own installation. If you choose the latter, please download and install Anaconda before the first class.

ELB 916 Computer Lab Access

To enter the computing lab, you need to use your student ID card.

To log in computers, you need to input your Computing ID and your PC LAN password. Please note that your PC LAN password is different from your CWEM password. Your PC LAN password is provided to you from ITSC with a Computing Accounts Information Slip.

Tentative Grading Scheme

Course participation	- 10%
Projects and presentations	- 90%

Class Schedule

Week 1-2	Overview and Basic Python Usage
Week 3	Data Scraping
Week 4	Regularization—Using Regression as an Example
Week 5	Cross Validation
Week 6-7	Classification and Clustering
Week 8	Working with Text Data
Week 9	Introduction to Artificial Neural Network
Week 10	Convolutional Neural Networks and Recurrent Neural Networks
Week 11	Transformer-based models
Week 12	Collaborative Filtering
Week 13	Reinforcement Learning (if time permits)
Exam Period	Student Presentations

Honesty in Academic Work

Please visit the following website for details of university policy on Honesty in Academic Work: http://www.cuhk.edu.hk/policy/academichonesty/.