1 Mathematics

Contents

Linear algebra, calculus, graphs, optimizations, numerical methods.

Learning outcomes

The purpose of this course is to familiarize students with undergrad to post graduate mathematics. More specifically, you will learn how mathematics is going to be useful for analytic.

2 Statistics

Contents

Basic Set theory, probability theory, random variables, statistical distributions, analysis of variance, sampling methods, Markov chain methods.

Learning outcomes

The purpose of this course is to familiarize students with undergrad to post graduate statistics. Applications of statistics into business and analytic, economics and finance, and variance fields of studies.

3 Programming

Contents

Principles of programming, variables and data structure, functions and modules, I/O file, handling large projects.

Learning outcomes

The purpose of this course is to familiarize students with imperative programming style. More specifically, you will learn how to construct algorithms and then program these algorithms in python programing language. The course will cove wide range of real finance problems with actual data sets.

4 Machine Learning

Contents

Finding patterns in data, handling missing and incomplete data, dimension reduction techniques, numerical methods in ML, decision tree and random forests, clustering, Support vector machines, genetic algorithm, modeling a real life problems into graphs, product recommendation methods, deep learning and neural network, boosting methods, stochastic gradient methods, kernel methods, fundamental theorem of learnings.

Learning outcomes

How to model and solve the real world problems of analytic using machine learning methods.

5 Computation finance

Contents

Risks, returns and various ratios, portfolio optimizations and markowitz theory, Monte-carlo simulations methods in finance, investments strategies, demand and supply matching methods.

Learning outcomes

How to use computers to better understand finance. How to make decision using analytic before investing.