Course Title: Algorithmic Trading with Python

Instructor: Dr. Ali Habibnia

Tentative Course syllabus: (20 hrs)

I. Introduction to Trading and Algorithmic Trading
   A. Overview of Trading
   B. Fundamental Trading Concepts
   C. Order Types and Order Management
   D. Introduction to Algorithmic Trading Systems and Automated Trading
   E. Day Trading, Market Microstructure and High-Frequency Trading (HFT)
   F. Spot Trading vs. Derivatives Trading

II. Python Programming for Algorithmic Trading
   A. Essential Python Libraries
   B. Popular Python Trading Platforms for Algorithmic Trading

III. Data Handling and Preparation
   A. Acquiring Financial Data from Open Data Sources & Broker APIs
   B. Retrieving and Visualizing Historical and Streaming Data via APIs
   C. Web Scraping for Financial Data
   D. Data Preprocessing Techniques
   E. Limit Order Book Data

IV. Algorithmic Trading Strategies and Paradigms
   A. Algorithmic Trading System Development Process
   B. Trend- and Momentum-Based Strategies
   C. Technical Analysis-Based Strategies
   D. Reversion and Change-Point-Based Strategies
   E. Statistical Arbitrage Trading Strategies
   F. High-Frequency Trading Strategies
   G. Machine Learning-Based Strategies
   H. Deep Learning for Algorithmic Trading Strategies
   I. Sentiment Analysis and Natural Language Processing
   J. Advanced Quantitative Trading Techniques

V. Strategy Testing and Evaluation

A. Backtest- Historical Test
B. Object Oriented Programming for the Backtesting
C. Walk Forward Testing
D. Paper Trading (Forward Testing)
E. Live Testing

VI. Order Execution and Management via APIs
A. Execution Technologies and Advanced Order Handling Techniques
B. Evaluating and Improving Trading Strategies
C. Running Algorithms in the Cloud and High Performance Computing (HPC)

VII. Algorithmic Trading Platforms and APIs
A. Example 1: Stock Trading with Thinkorswim
B. Example 2: Crypto Trading with Binance
C. Example 3: Forex Trading with IG