

Investment Strategies 2

MAF, Module 3, 2023-2024

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Course information

Course Website: <https://my.nes.ru>

Instructor's Office Hours: by assignment

TAs: n/a

Course description

This course covers a broad range of topics related to investment strategies. The course is very applied and focuses on the technical side of the subject. It heavily uses Python for strategies development and backtesting, and data manipulation.

- The first part is devoted to providing some cases in quantitative research and trading. It will cover different asset classes with special focus on equities and strategies types as well as different approaches to portfolio formation, risk management, asset classification and machine learning applications on financial data.
- The second part of the course starts with an introduction to behavioral finance and market inefficiency. Then we will make a general overview of trading strategies and discuss their quantitative metrics. Later we will learn how to develop and backtest strategies using various Python tools.

Course requirements, grading, and attendance policies

Prerequisites:

1. Python
2. An introductory finance course

Grading:

Case	25%
Project 1	25%
Project 2 (to be presented at the last lecture)	25%
1 homework problem set	15%
Game	5%
Quizzes	5%

Course contents

The first part

- **Financial data:** overview of contemporary quant trading ecosystem
- **Strategies testing** and machine learning: how to avoid overfitting
- **Risk management**, assets classification, structure extraction
- **Optimal execution** and transactions cost estimation
- **Equities trading strategies:** framework for strategies development

The second part

- **Introduction to Behavioral Finance:** psychological biases, market inefficiencies, limits of arbitrage

- **Investment Strategies Overview:** momentum and reversal strategies, predicting factors, statistical arbitrage
- **Trading Strategies Basics:** strategy design, backtesting, performance metrics
- **Python for strategy backtesting:** strategy development, data analysis and manipulation using pandas
- **FX Trading strategies:** carry trade with momentum and reversal enhancement
- **Fixed income Trading strategies:** mean-reversion patterns in fixed income, spread and straddle interest rates trading, capital structure arbitrage, convertible arbitrage
- **Options and Volatility Trading:** volatility arbitrage, put option premium
- **Trader's psychology:** what are the differences between good and bad traders?

Description of course methodology

- Lectures
- Homeworks
- Project

Sample tasks for course evaluation

Pair trading:

Find a pair of US equity P and Q, which prices satisfies cointegration.
Consider the historical time interval from one to three years.

Course materials

Textbooks and materials

- Lecture notes
- John Hull, "Options, Futures, and Other Derivatives", 9th edition.
- Edwin Lefevre. Reminiscences of a Stock Operator
- E.P. Chan's "Quantitative Trading" (2009)
- Lopez de Prado, Marcos, "Advances in Financial Machine Learning" (2018)

Academic **integrity policy**

Cheating, plagiarism, and any other violations of academic ethics at NES are not tolerated.