

ACADEMIC YEAR 2016-2017

Seminar: Algorithmic Trading

Prof. Emilio BARONE

Semester 1st

Period: from 1/10/2016 to 3/12/2016 (no class on November 5th) see the calendar below
N.B. Any variation in the calendar will be communicated.

Classes will be held on Saturday from 10.00-13.00

Total lectures n. 9

Students are required to attend n. 7 lectures at minimum and to pass the final test in order to have 4 CFU as Other Activities.

Course contents:

In computerized financial markets, algorithmic trading (also known as algo trading, automated trading, black-box trading or robo trading) is the use of applications which allow the automatic entering of buy or sell (market and / or limit) orders. It is the algorithm developed from programmers which decides crucial aspects of orders as timing, price and / or quantity.

Algorithmic trading is growing massively – it's cheaper, faster and better to control than standard trading. It enables financial institutions to 'pre-think' the market, executing complex math in real time, and take the required decisions based on the strategy defined.

The cost alone (estimated at 6 cents per share manual, 1 cent per share algorithmic) is a sufficient driver to power the growth of algo trading. According to some estimates, high frequency trading firms alone account for 73% of all US equity trading volume.

To learn how securities are actually traded in financial markets, we will use trading cases (simulations) based on the Rotman Interactive Trader (RIT) platform.

Finance theory will help us to understand the risk / return tradeoff inherent in particular trading strategies.

Excel applications linked to the real-time data-feeds from the simulated market will guide our decision making and allow us to develop effective trading strategies.

These strategies will also be implemented by developing algorithms written in Visual Basic for Application (VBA).

1st lecture 1/10/2016 aula 211:

Getting a grip on trading, market vs. limit orders, bid-ask prices, Rotman Interactive Trader (RIT), selection criteria for the Rotman International Trading Competition (RITC).

2nd lecture 8/10/2016 aula 200:

Introduction to VBA macros. Social Outcry (live simulation).

3rd lecture 15/10/2016 INFO 306:

Market microstructure: instructions (RTD function, orders from institutional investors).

4th lecture 22/10/2016 INFO 306:

Options trading: instructions (arbitrages, delta-neutral strategies).

Commodities case: instructions (producers, refiners, traders).

5th lecture 29/10/2016 INFO 306:

Market microstructure: competition.

6th lecture 12/11/2016 INFO 306:

Options trading: competition.

7th lecture 19/11/2016 INFO 306:

Commodities trading: competition.

8th lecture 26/11/2016 INFO 306:

Algorithmic trading: testing the programs.

9th lecture 3/12/2016 INFO 306:

Algorithmic trading: competition.

N.B. Please, check the room before each seminar.

Assessment method:

Individual computer-based assignments, based on RIT (Rotman Interactive Trader) platform.

Students will be ranked according to the scoring methodology used for the Rotman International Trading Competition.

The main purpose of the system is to reward consistently high performance, i.e. a student who places 8th, 5th, and 10th will have a higher final score than a student who places 1st, 10th, and 35th.

Suggested reference reading material:

- o Release Files, Rotman School of Management, University of Toronto
 - Case Brief (CB)
 - Trader's Guide (TG)
 - Case Tutorial (CT)
 - Support Sheet (SS)
- o - Algorithmic Trading Case
 - Algorithm 1 (ALGO1) – Arbitrage [CB, CT, SS]
 - Algorithm 2 (ALGO2) – Market Making [CB, CT, SS]
- o - Market Microstructure Case
 - Market Microstructure 1 (MM1) – Order Driven Markets [CB, TG, SS]
 - Market Microstructure 2 (MM2) – Liquidity [CB, TG, CT, SS]
 - Market Microstructure 3 (MM3) – Alternative Trading Venues [CB, TG]
- o - Options Case
 - Options 1 (OP1) – Puts & Calls [CB, TG, SS]
 - Options 2 (OP2) – Hedging [CB, TG, SS]
 - Options 3 (OP4) – Trading Volatility [CB, TG, SS]
- o - Commodities Case
 - Commodities 1 (COM1) – Energy Trading [CB, CT, SS]
- o - RIT VBA Introduction – Tutorial [RIT VBA]
- o MICROSOFT (MS), Visual Basic Developer Center
- o VBA Lessons (VBA-L) 1-2, 5-6, 9, 11-12
- o VBA Tutorials (VBA-T) 1-16, 20-21, 24-26, 29

Final work or test:

Four trading competitions in the last five lectures.