

# Quantitative Trading Using R

Winter term 2016

## Syllabus

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### Description

The course introduces participants into the prerequisites necessary for quantitative trading. These prerequisites are going to be taught in the statistical programming language R. Further, several trading rules are presented and how to implement them in R.

### Dates

From 2016-10-24 until 2016-12-22, weekly on Mondays 16.15h - 17.45h in C01 and Wednesdays 16.15h - 17.45h in C502.

### Basic Course Outline

The following topics will be covered:

1. Introduction
2. Getting started with R
3. Working with data

4. Statistics and probability
5. Spreads, betas and risk
6. Backtesting with quantstrat
7. Global macro investing
8. Trend-following investing
9. Pairs trading and statistical arbitrage
10. Flipped classroom session
11. Optimization and portfolio construction
12. Reporting and speed

## Grading

The grade of the course is based on the grade of a mandatory term paper and an accompanying presentation. The participants may work on an additional assignments. Working on these assignments is optional but strongly recommended. Conditional on passing the term paper and all assignments, the participant can gain a bonus to the final grade of the term paper. The assignment needs to be completed in pairs of two students.

## Term paper

The term paper has to be handed in by 2016-12-31, 23.59h and needs to be completed individually (i.e. not in groups).

## Literature

Berlinger, E. (2015). Mastering R for Quantitative Finance. PACKT Publishing.

Cochrane, J.H. (2005). Writing tips for Ph.D. students. [https://faculty.chicagobooth.edu/john.cochrane/research/Papers/phd\\_paper\\_writing.pdf](https://faculty.chicagobooth.edu/john.cochrane/research/Papers/phd_paper_writing.pdf).

Daroczi, G. (2013). Introduction to R for Quantitative Finance. PACKT Publishing.

Georgakopoulos, H. (2015). Quantitative Trading with R - Understanding Mathematical and Computational Tools from a Quant's Perspective. Palgrave Macmillan US.

Kleiber, C., & Zeileis, A. (2008). Applied Econometrics with R. Springer.

Pedersen, L. H. (2015). Efficiently Inefficient. Princeton Univers. Press.

H. Stock, J., & W. Watson, M. (2014). Introduction to Econometrics (3rd revise). Prentice Hall.

Tsay, R. S. (2010). Analysis of Financial Time Series. John Wiley & Sons.