**COURSE CODE: QF621**

**COURSE TITLE: Quantitative Trading Strategies**

Instructor : Dr Benjamin Ee

**Pre-requisite/CO-REQUISITE/MUTUALLY EXCLUSIVE cOURSE(S)**

None

**COURSE AREA**

1. Finance

**Grading BaSIS**

Graded

**Course UNIT**

1 CU

**FIRST OFFERING TERM**

Academic Year: AY2018

Academic Term: Term 4

# COURSE DESCRIPTION

This course will discuss systematic investment strategies. Strategies are organized into 2 categories: equities and global macro. The former will include a survey of strategies based on corporate information (fundamentals, sentiment, price volume, supply chain) as well as factors from behavioural finance and their relevance to systematic investing. The latter will include asset allocation, directional strategies and volatility.

We will discuss the role of central banks (e.g. the Federal Reserve), fiscal policy, as well as the banking system during financial / economic crises. The dual mandate (e.g. formal or de facto) of ensuring full employment whilst moderating inflation will also be examined.

The course will discuss practical considerations in live trading, such as realistic trading costs assumptions, market impact, execution slippage, risk management, pros-cons of various program order types / params and capital allocation.

Students will participate in a class project where selected trading strategies will be implemented in a widely used industry relevant language (e.g. Python, Java or C++). In class discussions, we may also leverage open source code to illustration portfolio strategies (basic implementations will be provided by instructor). Lastly, we will devote some time to an overview of the global and Singapore quantitative trading ecosystem and discuss ongoing experiences with setting up and running a regulated fund management company.

During this course, students will be provided with reference implementations of selected quantitative investment strategies in a commercially relevant language such as Python. Provided code is intended to work “out of the box”. Students may find it useful to use this framework code base as a starting point for further experimentation.

**LEARNING OBJECTIVES**

On successful completion of the course, students should be able to:

* Be familiar with the broad landscape of quantitative investment strategies in both equities and global macro categories, and appreciate the economic intuition behind common / prominent strategies types in each area.
* Appreciate the framework behind selected equities, futures and volatility strategies for which we will deep dive
* Articulate the impact that central banks, fiscal authorities and money center banks may have on global macro and volatility strategies
* Understand the motivation behind portfolio combinations of investment strategies, construct portfolios with realistic trading costs and risk management.
* Compare and contrast the role of fiat and non-fiat currencies for liquidity and store of value purposes
* Follow current research in quantitative investing
* Gain a practical understanding of the process of establishing and running a regulated fund management company

**ASSESsMENT METHODS**

Basis of Assessment

Class participation and discussion 20%

Group Project 40%

Final exam 40%

**ACADEMIC INTEGRITY**

All acts of academic dishonesty (including, but not limited to, plagiarism, cheating, fabrication, facilitation of acts of academic dishonesty by others, unauthorized possession of exam questions,  or tampering with the academic work of other students) are serious offences.

All work presented in class must be the student’s own work.  Any student caught violating this policy may result in the student receiving zero marks for the component assessment or a fail grade for the course.  This policy applies to all works (whether oral or written) submitted for purposes of assessment.

When in doubt, students are encouraged to consult the instructors of the course. Details on the SMU Code of Academic Integrity may be accessed at [http://www.smuscd.org/resources.html](about:blank).

**Recommended READINGS**

*Provided hyperlinks should retrieve full text.* ***All readings are intended to open source and should not be locked behind ‘paywalls’****.*

1. Fama, E. F. and French, K. R. (2008), Dissecting Anomalies. The Journal of Finance, 63: 1653-1678. [https://pdfs.semanticscholar.org/99ce/e66ee68a65aeb67f97c1e224103cff0df208.pdf](about:blank)
2. Frazzini, Andrea and Israel, Ronen and Moskowitz, Tobias J., Trading Costs of Asset Pricing Anomalies (December 5, 2012). Fama-Miller Working Paper; Chicago Booth Research Paper No. 14-05. [https://ssrn.com/abstract=2294498](about:blank) or [http://dx.doi.org/10.2139/ssrn.2294498](about:blank)
3. Robert Novy-Marx, Mihail Velikov; A Taxonomy of Anomalies and Their Trading Costs, The Review of Financial Studies, Volume 29, Issue 1, 1 January 2016, Pages 104–147, [http://rnm.simon.rochester.edu/research/ToAatTC.pdf](about:blank)
4. Campbell R. Harvey, Yan Liu, Heqing Zhu; … and the Cross-Section of Expected Returns, The Review of Financial Studies, Volume 29, Issue 1, 1 January 2016, Pages 5–68, [https://academic.oup.com/rfs/article/29/1/5/1843824](about:blank)
5. Managed Futures Research: A Composite CTA Performance Review, Thomas Schneeweis, Richard Spurgin, Edward Szado, The Journal of Alternative Investments Dec 2012, 15 (3) 32-61; DOI: 10.3905/jai.2012.15.3.032
6. Irwin, Scott H. and Holt, Bryce, The Effect of Large Hedge Fund and CTA Trading on Futures Market Volatility. COMMODITY TRADING ADVISORS: RISK, PERFORMANCE ANALYSIS AND SELECTION, Greg N. Gregoriou, Vassilios N. Karavas, Francois-Serge L'Habitant, Fabrice Rouah, eds., John Wiley and Sons, Inc., 2004. Available at SSRN: <https://ssrn.com/abstract=558661>
7. Introduction to Risk Parity and Budgeting: <https://www.researchgate.net/profile/Jason_Hsu8/publication/228206016_Risk_Parity_Portfolio_vs_Other_Asset_Allocation_Heuristic_Portfolios/links/00b7d532848224ae2d000000/Risk-Parity-Portfolio-vs-Other-Asset-Allocation-Heuristic-Portfolios.pdf>

## TENTATIVE SCHEDULE

|  |  |
| --- | --- |
| **Class**  **No.** | **Topic** |
| 1 | Course overview, introduction to quantitative investing by asset class, risk-return characteristics and trading frequency |
| 2 | Simple equities strategies (formed on individual instruments) based on time series patterns. |
| 3 | Systematic investing strategies based on corporate fundamentals  Common data sources available to systematic portfolio managers, including platform specific discussions on Bloomberg and Eikon |
| 4 | Systematic investing strategies based on investor and analyst sentiment  Microeconomic underpinnings of the systematic strategies, based on behavioural finance and large-scale patterns in investor psychology |
| 5 | Portfolio combinations of systematic investment strategies |
| 6 | Quantitative asset allocation (including risk parity)  Volatility as an asset class  Role of monetary and fiscal policies as macroeconomic stabilizers; fiat versus non-fiat currencies: store of value and liquidity |
| 7 | Futures curve carry  Futures trend following (CTA) |
| 8 | Execution: portfolio construction, execution costs, market impact, slippage and strategy capacity  Trading ecosystem: hedge funds, prime brokers, exchange / ECNs, emergent market microstructure and implications for trading costs, capacity and execution quality |
| 9 | Infrastructure dependent strategies (including high frequency trading)  Trends in alternative data  Legal structuring for the systematic investment industry: fund management companies, funds, regulators, taxes, jurisdictions, and service providers |
| 10 | Student presentations |