**COURSE CODE: QF623**

**COURSE TITLE: Portfolio Management**

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

None

**COURSE AREA**

1. Quantitative Finance

**Grading BaSIS**

Graded

**Course UNIT**

1 CU

**FIRST OFFERING TERM**

Academic Year: AY2024-25

Academic Term: Term 3

# COURSE DESCRIPTION

The aim of this module is to introduce students to the asset management industry with an emphasis on common risk premia strategies and portfolio construction methods. Given the focus on the MSc program, the course will be taught with a quantitative bent. However, the overarching aim is to equip students with the key tools and a broad awareness of the key issues in the industry. It is targeted at students with a keen interest to join the asset management industry as a quantitative analyst or portfolio manager. The course will first look at the theoretical aspects of modern portfolio theory. Following that risk premia strategies at both the top-down asset class level and the bottom-up security selection level will be explored. Finally, we examine alternative portfolio construction methods aiming to mitigate the shortfalls inherent in portfolios constructed by the classic mean-variance optimization approach. The course attempts to blend a combination of technical rigor, real life practice as well as insights from academic research. Some numerical implementation using software packages such as MATLAB, R or Python may be involved during project work. The course delivery is intended to be interactive with active student engagement to foster a learning environment that facilitates creative thinking in the process of peer learning.

**LEARNING OBJECTIVES**

By the end of this course, participants will be able to:

* Understand modern portfolio theory.
* Understand the risk factors driving the various asset classes.
* Understand common anomalies exploited in quantitative stock selection models as well as the methodology to test for these anomalies.
* Understand the Fundamental Law of Active Management
* Understand risk-based portfolio construction methods
* Understand alternatives to mean-variance optimization such as the Black-Litterman model.
* Construct a portfolio with the desired characteristics including the estimation of inputs.
* Appreciate current trends in the asset management industry

**ASSESsMENT METHODS**

The various key assessment components are as follows:

**1. Individual Assessment: 55% of total, consisting of**

- Class participation 10%

- Exam 90%

**2. Group Assessment: 45% of total, consisting of**

- Portfolio management project(s) 100%

**INSTRUCTIONAL MethodS AND EXPECTATIONS**With reference to the above, assessments cover both the individual (60%) and group (40%) levels.  
   
**Individual assessment: 55% of total**

* **Class participation (10% of component):** Creative thinking and peer learning is expected through open sharing from real work situations.
* **Exam (90% of component):** This will take the form of a written exam for duration of **two hours**.

**Group assessment: 45% of total**

* **Portfolio management project(s) (100% of component):** The class will be broken down in groups to undertake related portfolio management projects. This can involve the construction of a custom portfolio with the desired characteristics given a dataset. Some programming may be required. Presentation slides with the associated output must to be submitted in class towards the end of the course.

Grading criteria for presentation is quality of content, analytical and inference abilities, teamwork, and ability to answer questions posed.

**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**Specific references will be given in the lecture notes. There is no need to acquire a specific text.

**CLASS TIMINGS**The course is taught in over 10 three-hour sessions

**WEEKLY LESSON PLAN**

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| Lesson | Topics |
| 1 | **Top-down risk premia strategies**   * Equities, bonds, commodities and FX * Cross-sectional: Value, carry, momentum * Time series: Trend following CTA * Options: Volatility selling * Project introduction |
| 2-5 | **Bottom-up equity anomalies and risk premia I**   * Strategy implementation based on long-short factor mimicking portfolios * Methodology used in testing for statistical significance of “alpha” based on some benchmark model (e.g. Fama-French 3 factor model) * Common risk premia strategies used by practitioners and their caveats |
| 2-5 | **Bottom-up equity anomalies and risk premia II**   * Common equity anomalies used by practitioners and their caveats * Multi-factor models: Combining different risk premia and anomalies * Factor style timing: Can regimes help in identifying style timing? |
| 2-5 | **Modern portfolio theory: Concepts and mathematics**   * Introduction to modern portfolio theory. * Impact of asset correlation and portfolio constraints on the efficient frontier * Markowitz problem in a benchmark-relative framework. |
| 6-8 | **Portfolio construction I**   * Understanding the limitations of mean-variance optimized portfolios * Practical portfolio constraints: Mandate restrictions, risk dimensions, liquidity/ market impact costs, turnover * Risk-based portfolio construction |
| 6-8 | **Portfolio construction II**   * Estimating the covariance matrix: Risk factor models, shrinkage techniques * Understanding the Black-Litterman approach * Understanding the Fundamental Law of Active Management |
| 9 | **Portfolio Risk Management and Performance Analysis (FRM syllabus)**   * Appreciate different hedge fund styles and their associated return/ risk characteristics * Understand different risk metrics * Understand different performance measurement metrics * Hedge fund performance attribution: Market timing , style loading |
| 9-10 | **Project presentation** |