RMBI 3110
Introduction to Risk Management and Business Intelligence

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Department of Information Systems,
Business Statistics and Operation Management

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Class meets: TuTh 9:00AM - 10:20AM Rm 1034, LSK Bldg

Course Objectives and Outcomes

Objectives: This course presents concepts and techniques for risk management and business intelligence from entry level to intermediate level. We will apply modern analytic approaches to predict and evaluate risks and anomaly in market activities.

Outcomes: After completing this course, you are expected to know, how to use quantitative risk tools and business intelligence technique to help you evaluate and handle financial risks.

Course Materials

A. Reference book " Risk Management and Financial Institutions ", John C, Hull.

B. Reference book " A practitioner's guide to asset allocation", W Kinlaw, MP Kritzman, D Turkington, 2017

C. Reference book " Expected Returns: An Investor's Guide to Harvesting Market Rewards", Antti Ilmanen, 2011.

D. Reference book "Quantitative Equity Portfolio Management: An Active Approach to Portfolio Construction and Management", Petter N. Kolm, Frank J. Fabozzi, Dessislava Pachamanova, and Sergio M. Focardi, 2007.

E. Reference book "Machine Learning for Factor Investing " by Guillaume Coqueret and Tony Guida, 2023.

F. You need to complete two assignments with python. Basic knowledge of Python(i.e. ISOM 2020 and ISOM 2600) is required for this course.

G. A course website (http://canvas.ust.hk) is maintained.

Evaluation

Your overall grade will be based on the following items:

A. 2 Assignments (30%): The first assignment is grouped assignment(group size $\leq$ 3) and the second assignment is an individual assignment. The weights of two projects are 15% and 15%.

B. Final(60%): There will be no makeup exam.

C. Attendance(10%): you need to attend 90% lectures to get full attendance.

Course Outline

Module 1 (Weeks 1–3): Python Literacy for Data Reasoning

This module develops foundational Python literacy required to read, modify, and reason about data analysis workflows. The emphasis is on understanding data structures, transformations, and analytical logic rather than software engineering. Students learn to work effectively in Google Colab and to interpret outputs in a financial context.

Module 2 (Week 4): Financial Markets as Data Objects

This module introduces equity, foreign exchange, and fixed income markets from a data-centric perspective. Students learn how prices, returns, benchmarks, and yields are represented in datasets and how such representations shape the questions that can be meaningfully asked. The module emphasizes interpretation over institutional detail.

Module 3 (Weeks 5–6): Dependence, Factors, and Portfolio Interpretation

This module examines correlation, regression, and factor-based reasoning as tools for understanding portfolio behavior. In addition to explaining co-movement and exposure, the module introduces practical ways to assess portfolio risk based on positions and return-generating factors.

Students learn how factor models can be used to interpret sources of risk, how exposure instability affects portfolio outcomes, and why return attribution and risk attribution are closely related but not identical. The focus is on assessing risk from observed portfolio behavior rather than constructing optimal portfolios.

Module 4 (Weeks 7–8): Portfolio Construction and Risk Allocation

This module discusses portfolio construction as a decision-making process under constraints. Traditional ideas of diversification and risk allocation are introduced alongside practical considerations such as concentration, position sizing, and exposure limits.

In addition to static allocation concepts, the module highlights dynamic aspects of risk management, including when to adjust exposure, rebalance positions, or maintain allocations in response to changing conditions. Portfolio discussions emphasize how risk considerations influence allocation decisions over time.

Module 5 (Weeks 9–10): Time Series, Stability, and Risk Evaluation

This module introduces time series concepts as tools for evaluating the stability and reliability of risk models. Rather than focusing on forecasting accuracy, the emphasis is on understanding how risk estimates evolve over time and how model performance may degrade under changing conditions.

Students learn to evaluate volatility, dependence, and exposure measures using time series perspectives, and to assess when risk models remain informative versus when they become misleading. The module emphasizes practical evaluation of risk management approaches in dynamic environments.

Module 6 (Weeks 11–12): Integrated Portfolio Reasoning

This module integrates concepts across previous modules through applied discussion and analysis. Students synthesize data interpretation, portfolio reasoning, and model evaluation to assess portfolio decisions in equity, FX, or fixed income contexts. This module prepares students for the in-class final project.

AI Use Policy

AI tools (e.g., ChatGPT and other coding assistants) are **allowed and encouraged** in this course for learning, brainstorming, debugging, and improving clarity. We will also use AI in class to support discussion and exploration. This course evaluates **your understanding and judgment**, not your ability to paste generated output.

There is non-negotiable rule for assignments:**Copy-paste submissions are not accepted.** If an assignment submission contains AI-generated content that is pasted in without genuine understanding—especially code you cannot explain— **the assignment will receive a score of zero.** For any code you submit, you must be able to:

- Explain what the code does in each cell using your own language.
- Describe how you tested it and how you know it works
- Modify the code when asked (e.g., change a parameter, handle an edge case, adjust a method)

For each assignment, include a brief "AI Use Note" (3–6 lines) stating:

- Which AI tool(s) you used
- What you asked it to do (high level)
- What you changed, verified, or rejected
- One sentence on what you learned or what you found questionable

You do **not** need to paste full chat logs unless requested, but you must be honest about AI involvement.

Using AI does not remove academic integrity requirements. Submissions must reflect your own work and reasoning. Getting someone else (human or AI) to produce a complete solution that you submit as your own is considered misconduct.

Grievance Procedure

If you disagree with grades that have been assigned to your work, you have the possibility to meet instructors within one week after the grades have been published on the course website. Be specific about what it is that you don't agree with.

Academic Integrity

Academic dishonesty includes, but is not limited to, cheating, plagiarizing, fabricating of information facilitating acts of academic dishonesty by others, having unauthorized possession of examinations, submitting work of other groups, or tampering with the academic work of other groups. All exam answers must be your own, and you must not provide any assistance to other students during exams.