GENERAL INFORMATION

Instructor: Grace Xing Hu
Email: gracexhu@hku.hk
Office: 818 kkleung building
Phone: 3917 4178
Consultation times: By appointment

Tutor: TBA
Pre-requisites: FINA3350 Mathematical finance
Co-requisites: Mutually exclusive: STAT4608 Market risk analysis
Course Website: Moodle
Other important details: Notes

COURSE DESCRIPTION

This course introduces concepts, techniques and framework for quantitative risk management at financial institutions. Financial firms, with their complicated list of positions in a mixture of instruments, are exposed to various sources of financial risk. This class focuses mainly on market risk, the risk of unexpected changes in prices and rates. The first part of the course introduces basic concepts in risk management and builds the toolkit for measuring risk quantitatively. The second part of the course is devoted to studying the widely accepted Value at Risk (VAR) systems, including calculations, back testing and flaws of VAR. The course also touches on other aspects of financial risk such as liquidity risk, credit risk and operational risk.

COURSE OBJECTIVES

1. Learn the general concept of risk and risk management. Understand different sources of risk faced by financial institutions, how they manage risk internally and the related regulation requirement.

2. Acquire quantitative tools for measuring risk and know how to apply these techniques for hedging.

3. Understand the framework of Value-at-Risk. Use both analytic an simulation approaches to estimate VaR for single derivatives and complicated portfolios. Understand the pros and cons of different VaR estimation methods. Know how to do back testing for VaR using historical data. Understand the limitation and flaws of VaR.

4. Understand the basics of credit risk, liquidity risk and operational risk.

FACULTY GOALS

Goal 1: Acquisition and internalization of knowledge of the program discipline

Goal 2: Application and integration of knowledge

Goal 3: Inculcating professionalism and leadership

Goal 4: Developing global outlook

Goal 5: Mastering communication skills
### COURSE LEARNING OUTCOMES

<table>
<thead>
<tr>
<th>Course Learning Outcomes</th>
<th>Aligned Faculty Goals</th>
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<tbody>
<tr>
<td>CLO1</td>
<td>Goal 2, 3, 4, 5</td>
</tr>
<tr>
<td>CLO2</td>
<td>Goal 1 and 2</td>
</tr>
<tr>
<td>CLO3</td>
<td>Goal 1 and 2</td>
</tr>
<tr>
<td>CLO4</td>
<td>Goal 3, 4, 5</td>
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### COURSE TEACHING AND LEARNING ACTIVITIES

<table>
<thead>
<tr>
<th>Course Teaching and Learning Activities</th>
<th>Expected contact hour</th>
<th>Study Load (% of study)</th>
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<tbody>
<tr>
<td>T&amp;L1. Lectures</td>
<td>36</td>
<td>30</td>
</tr>
<tr>
<td>T&amp;L2. Assignments</td>
<td>24</td>
<td>20</td>
</tr>
<tr>
<td>T&amp;L3: Final Exam</td>
<td>24</td>
<td>20</td>
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<tr>
<td>T&amp;L4. Self-study</td>
<td>36</td>
<td>30</td>
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</table>

Total 120 100%

### Assessment Methods

<table>
<thead>
<tr>
<th>Assessment Methods</th>
<th>Brief Description (Optional)</th>
<th>Weight</th>
<th>Aligned Course Learning Outcomes</th>
</tr>
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<tbody>
<tr>
<td>A1. In-class participation</td>
<td>Exhibited high level of understanding of the course materials through excellent performance in class discussion, assignments, and exams.</td>
<td>10</td>
<td>CLO 1, 2, 3, 4</td>
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<tr>
<td>A2. Written assignments</td>
<td>Exhibited reasonably high level of understanding of the course materials through good performance in class discussion, assignments, and exams.</td>
<td>30</td>
<td>CLO 1, 2, 3, 4</td>
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<tr>
<td>A3. Final Exam</td>
<td>Exhibited fair level of understanding of the course materials.</td>
<td>60</td>
<td>CLO 1, 2, 3, 4</td>
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</table>

Total 100%

### STANDARDS FOR ASSESSMENT

<table>
<thead>
<tr>
<th>Course Grade Descriptors</th>
<th>A+, A, A-</th>
<th>B+, B, B-</th>
<th>C+, C, C-</th>
<th>D+, D</th>
<th>F</th>
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<tbody>
<tr>
<td>Exhibited high level of understanding of the course materials through excellent performance in class discussion, assignments, and exams.</td>
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<tr>
<td>Exhibited reasonably high level of understanding of the course materials through good performance in class discussion, assignments, and exams.</td>
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<tr>
<td>Exhibited fair level of understanding of the course materials.</td>
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<td>Evidence of basic familiarity with the subject.</td>
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<td>The candidate has demonstrated a poor grasp of the subject with evidence of largely inaccurate understandings of principles, concepts and arguments presented within this course.</td>
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### Assessment Rubrics for Each Assessment

(Please provide us the details in a separate file if the space here is not enough)
In-Class Participation

A+, A, A-: Extremely well prepared for class discussion, very active in sharing views and attended almost all lectures.
B+, B, B-: Partially prepared for class discussion, quite active in sharing views and attended most of the lectures.
C+, C, C-: Not well prepared for class discussion, limited active in sharing views and attended many of the lectures.
D+, D: Not well prepared for class discussion, no sharing of views and attended some of the lectures.
F: Poorly prepared for class discussion and no sharing of views and experience and rarely attended lectures.

Assignments and Final Exam

A+, A, A-: Almost all of the solutions are correct. Provide clear and detailed middle steps. Well written with clear focus.
B+, B, B-: Most of the solutions are correct. Provide some middle steps. Well written.
D+, D: A significant portion of the solutions are wrong. Provide very few middle steps. Writing is unclear.
F: Most of the solutions are wrong. Do not provide any middle steps. Poorly written.

COURSE CONTENT AND TENTATIVE TEACHING SCHEDULE

Lecture 1, 2: Introduction
Lecture 3: Interest Risk, Distribution of Asset Returns and Volatility Models
Lecture 5: Introduction of VaR
Lecture 6, 7: Simulation Approaches
Lecture 8, 9: Analytical Approach
Lecture 10: Back Testing, Limitation and Flaws of VAR. Scenario Analysis and Stress Testing
Lecture 11: Credit Risk, Liquidity Risk and Operational Risk
Lecture 12: Credit Risk (continued) and Review Session

REQUIRED/RECOMMENDED READINGS & ONLINE MATERIALS (e.g. journals, textbooks, website addresses etc.)

Textbook: The required textbook for this course is:
The following books are also useful references:

MEANS/PROCESSES FOR STUDENT FEEDBACK ON COURSE

☑ conducting mid-term survey in additional to SETL around the end of the semester
☑ Online response via Moodle site
☑ Others: Individual Meetings

COURSE POLICY (e.g. plagiarism, academic honesty, attendance, etc.)

The University Regulations on academic dishonesty will be strictly enforced! Please check the University Statement on plagiarism on the web: http://www.hku.hk/plagiarism/. Academic dishonesty is any act that misrepresents a person’s own academic work or that compromises the academic work of another. It includes (but not limited to) cheating on assignments or examinations; plagiarizing, i.e., representing someone else’s ideas as if they are ones own; sabotaging another’s work. If you are caught in an act of academic dishonesty or misconduct, you will receive an F grade for the subject. The relevant Board of Examiners may impose other penalty in relation to the seriousness of the offense.

ADDITIONAL COURSE INFORMATION (e.g. e-learning platforms & materials, penalty for late assignments, etc.)

Class Conduct: Respect your instructors and your fellow students. Be considerate to others. Common courtesy applies. Please keep as quiet as possible to ensure that everybody can concentrate on the lecture. If you have to leave the class early, please inform the instructor and the TAs before the class begins. Please sit near the door and exit quietly.