

**FINANCIAL RISK MANAGEMENT**  
**FINANCIAL MODELLING 9587/ECONOMICS 9587/9687**  
Department of Statistical & Actuarial Sciences / Department of Economics  
Western University

**Instructor:**

**August 2024**

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**Office Hours:** TBA

**Classroom meeting time(s) & location:** Monday 9:00am-12:00pm (noon) in WSC 248

**Course website:** <https://westernu.brightspace.com/>

**Graduate inquiries:** MFE students should contact Andrei at [mfe@uwo.ca](mailto:mfe@uwo.ca) and FM students should contact Thao at [pdang9@uwo.ca](mailto:pdang9@uwo.ca).

Students should use their official Western (@uwo.ca) email address for any communication to avoid problems with the spam filter.

**Prerequisites**

Proficiency in statistics, algebra, and calculus as well as university level reading comprehension and written and oral communication are required. At a minimum, this means that students should have completed at least one year of university level calculus and a year of statistics (or Econometrics). In addition, students should be familiar with the language and concepts of modern finance and economics.

**For MFE students:** Either FM9511, FM9522, FM9528 or equivalent, is a required prerequisite.

Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

**Target Academic Programs:**

This course should be of interest to students in the fourth term of the MFE, students with the relevant background knowledge in the M.Sc. in Financial Modelling, as well as upper year PhD students in Economics, Finance, and Statistical & Actuarial Sciences with career interests in the industry. Students with suitable academic background in the Ivey M.Sc. or PhD program may enroll with permission.

**Course Description/Overview:**

This course examines Risk Management concepts and quantitative applications in the financial industry. Commonly used quantitative measures of key risks (e.g., market, credit, operational, and liquidity risk) are examined, as well as their practical advantages and disadvantages as risk management tools. Key elements of the regulatory (e.g., Basel capital and liquidity regulation, stress testing) and organizational environment which constrain the practice of risk management are discussed.

Specific topics covered include:

- 1) What is risk? Risk adjusted value, risk tolerances and risk neutral preferences.
- 2) Definition and measurement of different types of risk – accounting risk, economic risk, environmental risk, financial risk, operational risk, reputational risk, technological risk etc.
- 3) Financial risk – capital market risk, liquidity risk, portfolio management, asset liability management.
- 4) Risk modelling, risk budgeting.
- 5) Scenario Analysis, Stress testing and Value-at-Risk.
- 6) Regulation, Basel III, Solvency II, Dodd-Frank, Central Banks, FSA etc.
- 7) Applications.

### Course Learning Outcomes:

Students who successfully complete this course will be familiar with core concepts of risk management currently used in the financial sector, will have a working knowledge of how to implement these techniques in a quantitative manner, and will understand their advantages and disadvantages. Students will also be familiar with basic aspects of the regulatory and organizational environment which constrain and inform the practice of risk management.

### Course Requirements:

Students are responsible for all the material covered in the lectures, as well as the material in assigned readings. They are expected to read and review the assigned material prior to the lecture at which it is to be discussed. While class attendance is not strictly compulsory, part of the final grade will be based on class participation.

Copies of material used in class, slides (which provide partial coverage of material discussed in the lectures), assignments and course readings will be available to download from the course website (<https://westernu.brightspace.com/>) and will not be distributed in any other form.

While Western intends to hold most classes, mid-terms and finals in-person, the London-Middlesex Health Unit may require Western to teach in a remote format. If this occurs, all classes and assessments will be done remotely. **Note that in this case none of the remote learning sessions for this course will be recorded.** Participants in this course are not permitted to record the sessions, except where recording is an approved accommodation, or the participant has the prior written permission of the instructor. Please contact the instructor if you have any concerns related to session recordings.

As such, completion of this course may require you to have a reliable internet connection and a device that meets the system and technical requirements for both Zoom and Proctortrack. Information about the system and technical requirements are available at the following links:

<https://www.proctortrack.com/tech-requirements/>

<https://support.zoom.us/hc/en-us>

### Evaluation:

The course grade will be based on student's participation in class and performance on the group projects, the homework assignments, and the final exam according to the following weights:

Class Participation	10%
Group Projects (2 @ 25%)	50%
Homework Assignments (3 out of 4 @ 5%)	15%
Final Exam	25%

### **Class Participation**

Students are expected to participate actively during lectures and in-class exercises.

### **Group Projects**

Each project is worth 25% of your grade. Students will form groups of 3-5 students and are graded on both the in-class presentation and the written submission via email.

### **Homework Assignments**

Assignments are due online using the OWL dropbox feature at the beginning of the lecture on the due date. **No late assignments will be accepted.** Your lowest grade is dropped when your homework average is computed. This means that if you fail to hand in one assignment it will not directly affect your grade.

Students are expected to do their own work on the assignments. Although you are encouraged to discuss the problems and possible solutions with classmates, you must provide your own individual independent answer. **Students who hand in identical assignments will receive a grade of zero.**

### **Final Exam**

The final exam will primarily consist of short answer problems. This is a closed book exam and no class notes, textbooks, or any other aids are allowed while writing the exam. Use of any such sources will be treated as a scholastic offence and reported to the relevant Department Chair, with a recommended grade of zero on the exam. A standard non-programmable calculator may be used.

In case Western is required to teach in a remote format, the final exam may be conducted using Zoom or a remote proctoring service, such as Proctortrack. By taking this course, you are consenting to the use of such software.

- In case **Zoom** is used, you will be required to keep your camera on for the entire session, hold up your student card for identification purposes, and share your screen with the invigilator if asked to do so at any time during the exam. The exam session **will not be recorded.**
- In case **Proctortrack** is used, you acknowledge that you will be required to provide personal information (including some biometric data) and the exam session **will be recorded.**

More information about these remote proctoring services is available in the Online Proctoring Guidelines at the following link:

<https://www.uwo.ca/univsec/pdf/onlineproctorguidelines.pdf>

### **Questions about Grades:**

Any requests for regrading of any assignment or exam has to be submitted in writing. Please indicated clearly which problem(s) you wish to have regraded and attach a detailed explanation of why you feel the grade should be changed. When regraded, the entire assignment or exam will be reconsidered, and it is therefore possible that you score may go up or down.

### **Textbook:**

The **required textbook** is:

- Crouhy, Michel, Galai, Dan and Mark, Robert (2014), *'The Essentials of Risk Management'*, second edition, McGraw-Hill.

While the Grouchy et al. text provides a good introduction to the concepts and current issues in risk management, it is written at a relative non-technical level. This text will therefore be supplemented with readings from other texts and/or journal articles. In general, these additional required readings will be available on the course website.

The following texts cover some useful background material, often with a more quantitative coverage than the Grouchy text:

- Beneplanc, Gilles and Rochet, Jean-Charles (2011), *Risk Management in Turbulent Times*, Oxford University Press.
- Christoffersen, Peter F. (2012), *Elements of Financial Risk Management*, Academic Press. This book covers the essential about Value at Risk and also has introduction to GARCH models, univariate as well as multivariate, realized measures and option pricing.
- Jorion, Philippe (2006), *Value at Risk: the new Benchmark for Managing Financial Risk*, 3. edition, McGraw-Hill.
- Malz, Allen (2011), *Financial Risk Management: Models, History and Institutions*, Wiley Finance.
- Van Deventer, Donald R., Imai, Kenji, Mesler, Mark (2013), *Advanced Financial Risk Management: Tools and Techniques for Integrated Credit Risk and Interest Rate Risk Management*, second edition, Wiley.

### **Policy on Academic Offences:**

Scholastic offences are taken very seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following web site: [https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/scholastic\\_discipline\\_grad.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_grad.pdf).

All required papers may be subject to submission for textual similarity review to the commercial plagiarism-detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between the University of Western Ontario and Turnitin.com (<http://www.turnitin.com>).

### **Accommodation and Accessibility**

Western is committed to achieving barrier-free accessibility for all its members, including graduate students. As part of this commitment, Western provides a variety of services devoted to promoting, advocating, and accommodating persons with disabilities in their respective graduate program. Students with Disabilities (for example, chronic illnesses, mental health conditions, mobility impairments) are encouraged to register with Student Accessibility Services, a confidential service designed to support graduate and undergraduate students through their academic program.

With the appropriate documentation, the student will work with both SAS and their graduate programs (normally their Graduate Chair and/or Course instructor) to ensure that appropriate academic accommodations to program requirements are arranged. These accommodations include individual counselling, alternative formatted literature, accessible campus transportation, learning strategy instruction, writing exams and assistive technology instruction. For more information, see:

<http://www.sdc.uwo.ca/ssd/>

Students should consult the University's list of recognized religious holidays, and should give reasonable notice in writing, prior to the holiday, to the Instructor and an Academic Counsellor if their course requirements will be affected by a religious observance. Additional information is given in the Western Multicultural Calendar:

<https://multiculturalcalendar.com/ecal/index.php?s=c-univwo>

### **Academic Policies**

The website for Registrar's Services is <https://registrar.uwo.ca/>. In accordance with policy, the centrally administered e-mail account provided to students will be considered the individual's official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at his/her official university address is attended to in a timely manner.

### **Support Services**

Please contact the course instructor if you require lecture or printed material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Student Development Centre (SDC) at (510) 661-2147 if you have questions regarding accommodation, see <http://sdc.uwo.ca/ssd/>. Learning-skills counsellors at the SDC are ready to help you improve your learning skills. They offer presentations on strategies for improving time management, multiple-choice exam preparation/writing, textbook reading, and more. Individual support is offered throughout the Fall/Winter terms in the drop-in Learning Help Centre, and year-round through individual counselling.

### **Statement on Mental Health:**

If you or someone you know is experiencing distress, there are several resources here at Western to assist you. Please visit <http://www.uwo.ca/uwocom/mentalhealth/> for more information on these resources and on mental health. Additional student-run support services are offered by the USC, see <http://westernusc.ca/your-services/>.