

125.811

## **Advanced Risk Analytics**

### COURSE GUIDE

Vietnam semester  
2021

# Massey Business School

## Te Kura Whai Pakihi

### MOEMOEĀ (VISION):

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To be a business school of consequence.

### TE PAE TAWHITI (MISSION):

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To be an educator that supports the wellbeing and ambition of students and staff, contributes to sustainable prosperity in Aotearoa New Zealand, and engenders impactful research of theoretical and practical significance.

### NGĀ UARA (VALUES):

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- |                                |                             |
|--------------------------------|-----------------------------|
| • Whai ngākau tētahi ki tētahi | Respect for all             |
| • Hāngai ki te tino ao         | Real-world relevance        |
| • He ako noa                   | Learning without boundaries |
| • Mā te rangahau e arataki     | Research-led thinking       |

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# Course Staff

## Course/Offering coordinator: Associate Professor Hung Do

Hung is currently an Associate Professor in Finance and Director of the Master of Finance program at Massey Business School (MBS). He is a member of the Assurance of Learning committee and was also a member of the MBS board between 2019 and 2020. He joined Massey in May 2017 as a Senior Lecturer in Finance/Banking. Prior to this, he had worked for major banks in Australia including Westpac and Commonwealth Bank of Australia. On the academic side, he had worked as a Lecturer at the School of Business, Monash University Malaysia, and a Postdoctoral Research Associate at University of Technology, Sydney. He obtained a Ph.D. in Financial Econometrics (2013) from Monash University Australia. Hung has taught a wide range of topics including Advanced Risk Analytics, (Advanced) Financial Risk Management, (Advanced) Business Finance, Financial Modelling, Commercial Bank Management, Investment Banking, Financial Econometrics, Quantitative Methods for Financial Markets, and Applied Time Series Econometrics. His teaching quality has been demonstrated by consistently high evaluation scores (normally 90-95%) and nominations for the Lecturer of the Year Award. Hung is specialized in Econometrics and Statistical analysis for Banking & Finance and his research interests are in Banking, Credit Risk, Empirical Finance, Energy Economics, and Time series econometrics. His research has been published in highly ranked international refereed journals including European Journal of Operational Research, Energy Economics, International Review of Financial Analysis, Journal of Real Estate Finance and Economics, Economics Letters, and International Review of Economic and Finance among others.

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# What is this course about?

## Summary of the course

This course analyses current theory, practice and governance in risk management process and evaluates their financial implications. Topics will include an identification, measurement, and evaluation of different types of risks, including market risk, credit risk, country risk, operational risk, and liquidity risk. The course will also cover the governance of the risk management process and practical lessons learnt from financial disasters.

## Course student learning outcomes

Students who successfully complete this paper should be able to:

1. Appraise current risk management practices.
2. Analyse the evolving process of risk management from historical shocks and appraise their financial implications.
3. Analyse financial data to formulate risk modelling and monitoring frameworks.
4. Critique the accepted practices of ethical conduct and professional integrity of financial risk practitioners.

## Relationship to other courses

You may enrol in a postgraduate course (that is a 700-, 800- or 900-level course) if you meet the prerequisites for that course and have been admitted to a qualification which lists the course in its schedule.

Prerequisite(s): 125.781

## Overview of the topics covered

<b>MODULE 1: Foundation of Risk Management</b>	
Week 1	Basics of risk management: a review
Week 2	Learnings from the financial disasters
Week 3	How traders manage their risks
<b>MODULE 2: Market risk</b>	
Week 4	Market risk analytics I
Week 5	Market risk analytics II
<b>MODULE 3: Credit risk</b>	
Week 6	Credit risk analytics I
Week 7	Credit risk analytics II
Week 8	Case study assessment and discussion
<b>MODULE 4: Other risks</b>	
Week 9	Country risk: Determinants, Measures, and implications
Week 10	Operational risk and measuring operational risk
Week 11	Liquidity risk
<b>MODULE 5: Model risk management</b>	
Week 12	Model risk management and Review

## How is this course assessed?

### The assessment at a glance

Assessment	Learning Outcomes	Percentage Weighting	Due Dates
Case study (group work)	1,2,4	20%	Week 8
Individual project	3,4	20%	Week 12
Final Exam	1,2,3,4	60%	TBC

## Assessment 1: Case study

### Format:

<b>Announced</b>	Week 3
<b>Due date</b>	Week 8
<b>Structure</b>	Case studies about financial disasters/crises will be given. You will be required to describe the historical background, identify factors which played an important role in the disasters/crises, identify different types of risks and appraise their financial implications. You will also be required to identify any possible violation of the ethical conducts in the case studies and its consequences.
<b>Submission</b>	125.811 Advanced Risk Analytics Stream site. Under Assessment section, click on the dropbox labelled “ <b>125811 Case study</b> ” to upload your work.
<b>Resources</b>	Lecture notes, textbook, reading materials and other internet source.
<b>Worth</b>	Maximum of 20% of final mark

## Assessment 2: Individual project

### Format

<b>Announced</b>	Week 8
<b>Due date</b>	Week 12
<b>Structure</b>	You will be required to collect and analyse financial data. Based on the real data, you will also be required to build, validate and stress-test the risk modelling and monitoring framework. Statistical software can be used to generate results for this project.
<b>Submission</b>	125.811 Advanced Risk Analytics Stream site. Under Assessment section, click on the dropbox labelled “ <b>125811 Individual project</b> ” to upload your work.

<b>Resources</b>	Lecture notes, textbook, reading materials and other internet source.
<b>Worth</b>	Maximum of 20% of final mark

## Assignment Extensions

An extension of time to complete an assignment may be granted at the discretion of the course coordinator in the case of unforeseen circumstances such as misadventure or illness. Applications for an extension of time should be made to the course co-ordinator by email or in person. You may be required to substantiate your application with appropriate documentary evidence such as medical certificates, accident reports etc. (Please note that work commitments, computer failures, or lack of commitment from other group members are usually considered insufficient grounds for an extension.)

Please let your course or offering coordinator know as soon as possible if you need an extension. We want to assist, but we need to hear from you.

## Late Assignments

We expect that you will work diligently to manage your workload and plan assignment preparation so you can submit in a timely fashion. This is part of the expectations for academic study. However, we also know that unexpected circumstances can and do arise.

If you do miss the deadline and you did not ask for an extension, you may still submit your assignment late. However, *in usual circumstances*:

- A penalty of 2 marks out of 100 per day (including weekends) will be applied to the final mark.
- Assignments that are 8-14 days late may receive little, if any, written feedback and may not be returned within the three-week turnaround time.

***If your assignment arrives 15+ days after the deadline, it will not be marked, and you will receive a zero grade.***

## Student Submission of Assignments

Many of you are aware of the increasing difficulties educational institutions are having dealing with issues of plagiarism. This problem impacts on students as it disadvantages honest

students, undermines the credibility of the qualification, and takes up huge staffing resources that could be better spent elsewhere. Massey uses Turnitin®, a text matching web application, as one of a variety of methods and technologies to detect and deal with the problem. The electronic version of the assignment you submit will be compared with material available on the world wide web including many electronic books, journals, newspapers, cheat sites (or paper mills), web pages and previously submitted assignments.

Please go to <http://www.massey.ac.nz/?ta5c75148n> for instructions on how to upload your assignments to the Stream course website.

## **Return of Assessments**

We aim to mark assignments submitted on time within 15 working days from the official due date.

# Academic Honesty and Plagiarism

For all course assignments it is acceptable (and helpful) to discuss the issues with other students. You may freely ask and answer questions that promote learning.

However, it is NOT acceptable to:

- Copy another student's work, in part or in total, or an official answer from either the current class or from a previous class.
- Allow other students to copy your work, in part or in total.
- Copy *your own work* if it has already been submitted for assessment elsewhere.
- Provide students in future years with copies of your assignments.
- Copy and paste sections from internet sourced documents or pages.
- Have another person prepare and/or write your assignment (or parts of your assignment) on your behalf.

**Plagiarism** is defined by Massey University as:

Presenting as one's own work the work of another, including copying or paraphrasing of another's work without acknowledging it as another person's work through full and accurate referencing. It applies to material presented through written, spoken, electronic, broadcasting, visual, performance or other medium.

Plagiarism can be avoided by correctly acknowledging the authorship of any material in your assignment that is not your own original work. Go to the [Online Writing and Learning Link](#) for guidance on correct referencing.

Plagiarism in an assignment may result in your assignment not being awarded any marks. In serious cases, it can result in even more serious disciplinary action by the University.

A link to the Student Guide to Academic Integrity at Massey University is [here](#).

Please make yourself familiar with the Code of Student Conduct available [here](#)

# How will we learn in this course?

## Approach to Teaching and Learning in the Course

Students who work steadily throughout the semester can reasonably expect to master the material. In the semester format, an average student will need to devote 20 hours per week to this paper in order to achieve a passing grade. The workload includes lectures, reading the textbook, revision of notes and test/exam studying. This means that you will have to organise your time very carefully to maintain the necessary pace. This paper is not one that can be crammed before the final exam.

Listed as “required-essential”, this paper relies on the internet (Massey Stream) to create an “online learning environment”. The capacity to access internet is compulsory for all the students. We urge everyone to regularly check our 125.811 Stream website, which contains all of the information about the paper progress. All materials will be provided through the Stream.

## Required Textbook

Reference textbook that is *required*:

### **Risk Management and Financial Institutions**

Author: John C. Hull

Edition: 5<sup>th</sup>

Publisher: Wiley Finance

ISBN-13: 978-1-119-44811-2

## Recommended book

This recommended book provides hand-on credit risk modelling examples using statistical software to analyse real data. The main book uses SAS, while the two companions of the book use R and Python, respectively.

### **Credit Risk Analytics: Measurement Techniques, Applications, and Examples in SAS**

Author: Bart Baesens, Daniel Roesch, Harald Scheule

Edition: October 2016

Publisher: Wiley Finance

ISBN-13: 978-1-119-14398-7

Other reading materials will be posted on Stream.

A calculator will be required in this course. At the very least the calculator should have buttons to compute  $y^x$  and logarithmic function. Calculator is very important for the tests and exam. There is no restriction on the calculator model. However, a laptop, PDA, and other types of computer are not allowed. You are not allowed to borrow a calculator during the test. You can bring in more than one calculator.

Statistical software such as Eviews (<http://www.eviews.com/download/student11/>) and R (<https://www.r-project.org/>) can be used to illustrate the steps in modelling volatility, copulas, and credit risk metrics including probability of default, loss given default and exposure at default. Note that Eviews student version and R are free to download.

# Learning Activities and Teaching Strategies

## Role of Stream

Stream is our learning environment – it’s our virtual classroom. It is the main place the resources for this course are stored, various learning activities are staged, and it is also where we talk with each other.

The Stream site will be available two weeks before the teaching semester officially begins. That means you don’t have to wait to get going - you can start exploring the environment and even start reading in advance.

## Course outline: Vietnam semester, 2021

Week #	Topic	Readings (Hull 5ed.)
		Textbook Chapters and Materials
<b>1</b> 20 June	Basics of risk management: a review	Chapter 1, Practice of ethical conduct materials (on Stream)
<b>2</b> 27 June	Learnings from the financial disasters	Chapter 6, Risk Management cases (on Stream)
<b>3</b> 04 July	How traders manage their risks	Chapter 8. Case study assessment announced.
<b>4</b> 11 July	Market risk analytics I – Volatility and GARCH	Chapter 10
<b>5</b> 18 July	Market risk analytics II – Correlations and Copulas	Chapter 11
<b>6</b> 25 July	Credit risk analytics I – PD, LGD and EAD	Chapter 19
<b>MID-SEMESTER BREAK (26 July – 07 August)</b>		
<b>7</b> 08 August	Credit risk analytics II – Credit Value at Risk	Chapter 21
<b>8</b> 15 August	Case study assessment and discussion	Case study assessment dues. Individual project announced.
<b>9</b> 22 August	Country risk: Determinants, measures, and implications	Reading materials (on Stream)
<b>10</b> 29 August	Operational risk and measuring operational risk	Chapter 23
<b>11</b> 05 September	Liquidity risk	Chapter 24
<b>12</b> 12 September	Model risk management and Review	Chapter 22, 25. Individual project dues.

## Course workload

The credit value for this class (30 credits) offers a guideline not only concerning the number of credits you earn towards the degree or diploma for which you are enrolled, but also concerning the total amount of time you might reasonably expect to spend on this course in order to complete it. A 30-credit course is defined by the Tertiary Education Commission as 300 hours of student workload, so you can expect to allocate to this course about twenty study hours outside of classes per week, although of course everyone works differently. Expect some weeks to be busier than others, especially when assignments are due, but *you should be working on your coursework regularly, every week.*

## Communicating with each other

The primary means of communication, further to our interaction in the lectures, are the Stream forums. These can be found under the Communication Tools tab on Stream. *Please use these forums to communicate with us, rather than contacting us via email.* This is because messages from individual student email accounts are sometimes misidentified by Massey email systems as spam, and filtered out – *ensure we hear from you by communicating via the Stream forums.* There are several forums, each with a different purpose. They include:

**News forum:** This is a one-way forum from us to you. Look here for important updates about this course. Note that these announcements will automatically be sent to your registered email address. If you see an email with 125.811 in the subject line, PLEASE READ IT - it will be important!

**Student Discussion:** Use this forum to chat with your classmates. This forum will not be monitored by staff.

**Personal Communication:** Use this to confidentially communicate with course staff about private matters, such as ill health, personal issues, etc.

**Course Information:** (think of this as a “Student to Coordinator Public Questions forum”). Use this to post general course-related questions and receive answers that are visible to all participants.

Other forums may include one or more **Assessments Forum** for queries about assessments.

If you "subscribe" to a forum, new messages get emailed to you (this is automatic for the News Forum, but for the others, you need to subscribe yourself).

## Communication expectations

We expect everyone in the Massey community to communicate courteously, appropriately, and constructively in all exchanges, as Massey's guidelines stipulate.

In terms of specific messages, it's important to be clear from the outset both what I expect of you and what you can expect of me. Here is what you can reasonably expect of me:

- responses to all discussion forum postings within 48 hours during the working week (Monday-Friday);
- responses to any personal communication within 48 hours during the working week.

Within reason, I also have a couple of expectations of you:

- use a meaningful subject line in your discussion postings;
- use the Stream discussion forums appropriately;
- support your colleagues in the course – that means encourage, help, and respect your fellow students.