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Actuarial Students' Society

SUBJECT REVIEW

2023 EDITION

Acknowledgements

Disclaimers

The Impact of COVID-19 on the Actuarial Students' Society Subject Review

Please note that some of the subjects reviewed in 2022 and prior reflect the individual author's education experiences in an online environment. While the authors have kept this in mind as they composed their reviews, undoubtedly, the aspects of some reviews — including assessment details and specific advice given — hold only for the online delivery of these subjects. We hope that the 2023 edition of the Actuarial Students' Society Subject Review can continue to provide valuable information for our members hereafter.

Subject Review Order

Each section of the subject review is ordered to match the standard course plan for the respective undergraduate and graduate courses in actuarial studies for the start of the year intake (please see sample course plans for more information) with any mathematics subjects following the commerce subjects. Please note that this order does not apply to breadth and elective subject reviews.

Contents

Preface

Welcome to this guide on the subjects studied as part of an Actuarial Studies major under the Bachelor of Commerce and the Master of Actuarial Science degree at the University of Melbourne. If you're reading this, you may be considering a career as an actuary and may be curious about what an actuarial student will encounter in their university studies.

While a quick online search will give you a definition of actuarial science as the discipline that uses mathematical and statistical methods to assess risk in various industries, this doesn't capture the full scope of becoming an actuary. The path to this career can be challenging and multifaceted, and as a result, the Actuarial Students' Society has made significant efforts to provide transparency regarding the subjects studied.

This guide is the result of our society's work, and we aim to provide you with an overview of each subject, written by students with diverse backgrounds, as well as general tips and advice based on their personal experiences. It's important to note that every review will be a subjective expression of opinion, and individual experiences may differ. Please keep in mind the year and semester of each subject review, as subject content, structure, and lecturers may change over time.

While we strive to ensure this guide is up to date, it's important to recognise that the reviewed curriculum may have been updated since the time of publication. However, we believe that these reviews will still be a valuable reference for understanding the general direction of each subject.

If you're interested in contributing a subject review for the next edition of this guide, please contact the Actuarial Students' Society at contact@melbourneactuary.com.

We hope that this guide will help you navigate the complex journey of becoming an actuary and provide you with the necessary tools to succeed in your studies!

— Pranit Parashar and Omar Amin (Education Team), February 2024

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About the Actuarial Students' Society

Founded in 1989, the Actuarial Students' Society has established itself as the University of Melbourne's official society for students undertaking actuarial studies, with the support of the University of Melbourne Centre for Actuarial Studies. Our aim at the society is to expand our members' career opportunities by bridging relationships between students and professionals alike, and by developing their actuarial skill sets.

By connecting our student members with like-minded peers, experienced lecturers, and sponsorship representatives, we enable our members to get a head-start in their actuarial careers. To achieve this, our society holds multifarious events, both social and professional. The Actuarial Students' Society's social calendar includes events like Trivia Night and Poker Night; they emulate a warm and amicable atmosphere that encourages students to mingle with other students and ask sponsors meaningful questions. Our professional calendar includes events like our flagship Contact Night, where students can network with and learn from working actuaries in a more formal setting.

The Actuarial Students' Society's didactic workshops in Excel and R equip our members with fundamental skills for the profession and the fiercest tools for job-seeking. Employers have favoured candidates who are proficient in such areas; we take pride in helping our members take real strides in their career development early on. Through the coalescence of constant exposure to the actuarial world, our members will learn to love the actuarial degree and profession. Your first step starts with us – the Actuarial Students' Society.

For more information, including how to become a member, please visit our website or Facebook page:

www.melbourneactuary.com

www.facebook.com/actuarialstudentssociety

Important Information on the 2023 Subject Review

Subject Reviews from Previous Editions

To provide the most value to our members, we have included reviews from previous editions of the ASS Subject Review for subjects not completed by any of our contributors in 2023. Each individual review specifies the year and semester in which the subject was completed.

Even though the curriculum, assessments, and/or other aspects of certain subjects may have changed since the original publication of their respective reviews, we still hope that these reviews will provide valuable guidance and insight to students who are enrolled in or considering enrolling in these subjects.

Inclusion of breadth and elective subjects

BCom students specialising in Actuarial Studies will satisfy part of the breadth component of their degree by completing two first year maths subjects, as well as MAST20004 Probability and MAST20005 Statistics. This means students get the choice of **one** other breadth subject that is **neither** commerce subjects **nor** subjects offered by the Department of Mathematics and Statistics. If the student chooses not to take ACTL10001, they get the choice of **one additional** commerce **discipline subject**.

With this in mind, the Actuarial Students' Society Subject Review will continue to include a range of breadths and electives available to our members. The inclusion of these reviews will assist all Actuarial students in deciding the right breadth or elective for them; whether they wanted a subject to broaden their study options, to learn concepts to complement their developing actuarial skillset or to have a subject in another field of interest.

Finally, the Actuarial Students' Society Subject Review has always been a publication by Actuarial students for Actuarial students. Whilst many of our members have been pure Actuarial majors, some portion of our membership and committee alike undertake the Actuarial major with another. Therefore, we have expanded the 2023 edition of the Actuarial Students' Society Subject Review to include subjects relevant in obtaining double majors with Actuarial and the Economics or Finance majors – written by students taking double majors themselves. Ultimately, their experiences can relate to many other first or second year Actuarial students standing at this crossroad; we hope that these reviews will help facilitate the making of this decision.

Attention First Years:

It is important that you are aware of the mathematics prerequisites required in this major. Please click the following link or direct yourselves to page 146 (Mathematics Prerequisites for the Actuarial Major) to learn more:

[Mathematics Prerequisites for the Actuarial Major](#)

Subject Reviews: First-Year Subjects

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CMCE10001 Sustainable Commerce [SM1]

Exemption status	Not an exemption subject, but it is a prerequisite for the *Bachelor of Commerce*
Prerequisites	None
Lecturer(s)	Prof Michael Davern Mr Paul Wiseman Ms Kris Young
Weekly contact hours	1 × 2-hour lecture 1 × 1-hour tutorial
Assessments	Joining Melbourne Modules 10% (hurdle) 400-word essay 10% Group assignment 30% - Quiz [marked individually] 5% - Discussion post and replies [marked individually] 15% - Group video 10% 1500-word sustainability report 30% Reflective essay 20% Tutorial attendance (hurdle)
Textbook Recommendation	None
Lecture Capture	Full (both audio and visual of slides). However, some lecture recordings had been heavily edited, removing important discussions for "privacy reasons"
Year and Semester Reviewed	2023 Semester 1

Comments

Sustainable commerce has two goals. Firstly, to provide new commerce students with an overview of each commerce discipline offered at Melbourne University and secondly to approach commerce from a non-profit based angle. The first goal may be helpful to students who are undecided about their major, however it provided a crude and simplistic overview of each discipline. For example, my tutorial concluded that actuarial science was just about "risk" and would be required in every single component of a supply chain. The second goal was also a needless pursuit, since the lecturers were focused on common sense examples that were irrelevant to assignments and poor preparation. Unfortunately, this subject is a compulsory subject.

Subject Content

This subject focused on the theories of sustainability in commerce and how they apply to organisations and particular stakeholders. Lectures and tutorials were case study focused, with the intention to teach students the tools to apply their understanding of sustainable commerce to create a sustainability report for an organisation.

Lectures

Lectures were a hybrid of lecturing and discussions. At least two of the three lecturers would attend each lecture and would briefly explain the content and then would prompt students to form group discussions with the students around you. These discussions would be mediated by tutors who would force groups to share

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with the whole lecture. Despite lecture attendance being a hurdle, no roll call was ever taken, and later in the semester the lecture attendance was abysmal. Many lectures are useless, and I would recommend watching the recording, however the lectures that are specifically about the Sustainability report are important to attend. I would highly recommended attending any lecture that is about "navigating sustainability problems" as it is very relevant to the third assignment, and the first lecture which is important for the first assignment.

Tutorials

The tutorials are marginally less useless than the lectures and are important to attend for two reasons. Firstly, to meet people to do the group assignment with which is assigned through the tutorial, and secondly to develop a good relationship with your tutor, as they mark all your assignments, which are very subjective. The tutorials also teach you how to research, cite and write academically properly which is the only important thing in learning in the entire subject.

Assessment

The Joining Melbourne Modules are the easiest 10% of a subject grade that you will ever get. Ensure that you complete them. Assignment 1 is relatively easy if you have a good understanding of the first lecture's content. Assignment 2 is also an easy grade for the first two parts, but make sure you choose a good group for group video, otherwise it can be hellish to complete. Assignment 3 is the closest thing this subject has to an exam, and as soon as you decide exactly what they are asking for the sustainability report, it is methodical to complete. Assignment 4 is a reflection and simple to do if you follow the reflective practice theory provided. Overall, the assignments are heavily biased to students for who English is their first language and who are good at English, i.e. can write very well. If this is not you, start your assignments early and make sure you organise a consultation with your tutor for help. Finally, the assignments are so subjective that success in the subject is a roll of the dice of how lenient of a marker your tutor is.

Overall Remarks

Sustainable commerce is a particularly painful subject, do the work and submit decent assignments so you don't have to do it again.

CMCE10001 Sustainable Commerce [SM1]

Exemption status	Not an exemption subject, but it is a prerequisite for the *Bachelor of Commerce*
Prerequisites	None
Lecturer(s)	Prof Michael Davern Mr Paul Wiseman Ms Kris Young
Weekly contact hours	1 × 2-hour lecture 1 × 1-hour tutorial
Assessments	Joining Melbourne Modules 10% (hurdle) 400-word essay 10% Group assignment 30% - Quiz [marked individually] 5% - Discussion post and replies [marked individually] 15% - Group video 10% 1500-word sustainability report 30% Reflective essay 20% Tutorial attendance (hurdle)
Textbook Recommendation	None
Lecture Capture	Full (both audio and visual of slides). However, some lecture recordings had been heavily edited, removing important discussions for "privacy reasons"
Year and Semester Reviewed	2023 Semester 1

Comments

Sustainable commerce has two goals. Firstly, to provide new commerce students with an overview of each commerce discipline offered at Melbourne University and secondly to approach commerce from a non-profit based angle. The first goal may be helpful to students who are undecided about their major, however it provided a crude and simplistic overview of each discipline. For example, my tutorial concluded that actuarial science was just about "risk" and would be required in every single component of a supply chain. The second goal was also a needless pursuit, since the lecturers were focused on common sense examples that were irrelevant to assignments and poor preparation. Unfortunately, this subject is a compulsory subject.

Subject Content

1. Why sustainable commerce
2. What is commerce?
3. What is value?
4. Commerce and sustainability
5. Markets and sustainability
6. Employees and sustainability
7. Leadership and sustainability
8. Navigating sustainability problems
9. Risk assessment and planning
10. Sustainable careers

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11. Reflective practice

Tutorials

Tutorials are the most beneficial part of sustainable commerce; however, it is still quite boring. There are group assignments that are important within your tutorial groups, these are one of the easiest marks to obtain so it is important to have a good group.

Assessment

The three (3) hurdle requirement Joining Melbourne Modules are part of your assessment and are worth 10% (free marks but make sure you complete it as it is a hurdle)
Assignment 1 is an individual essay worth 10%
Assignment 2 is a group project worth 30%
Assignment 3 is an individual sustainability report worth 30%
Assignment 4 is a reflective essay worth 20%

Overall Remarks

Sustainable Commerce introduces the idea of business sustainability and gives a snapshot of all the commerce disciplines offered at The University of Melbourne. However, this subject has a bad reputation as it does not prepare you for any of the assessments and gives little to no feedback. The assignments expect an in-depth essay that is marked harshly, however does not prepare, or teach how to write the essay properly. It is one of those subjects that no one will do if it was not mandatory.

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ACCT10001 Accounting Reports and Analysis [SM1]

Exemption status	Not an exemption subject, but it is a prerequisite for ACCT10002 *Introductory Financial Accounting* (CB1 Business Finance) and the *Bachelor of Commerce*
Prerequisites	None
Lecturer(s)	Mr Noel Boys
Weekly contact hours	1 × 1.5-hour lecture 1 × 1.5-hour tutorial
Assessments	Tutorial participation and attendance 3% Tutorial preparation, attendance, and participation 6% Assessable tests 4 x 1% Individual assignment 10% Group assignment 10% 3-hour end of semester exam 70%
Textbook Recommendation	Birt, J, Chalmers, K, Maloney, S, Brooks, A, Oliver, J & Bond, D 2023, Accounting: Business Reporting for Decision Making, 8th end, Wiley, Australia ✓ **Recommended**. Whilst the lectures covered all the content, the textbook goes into greater detail and is an excellent tool for further clarification. There is a surplus of practice questions in the textbook that are otherwise not provided.
Lecture Capture	Full (both audio and video)
Year and Semester Reviewed	2023 Semester 1

Subject Content

This subject focused on the basics of financial accounting (the preparation of financial reports for external users) which comprised much of the course, and the basics of management accounting (decisions made by internal users).

1. **Regulatory Framework / Conceptual Framework**
   This topic covers the nature and purpose of accounting, the information needs of users of accounting information, the conceptual framework behind General Purpose Financial Reports and the different types of business structures.
2. **Transaction Analysis & Financial statements**
   This topic introduces the accounting equation and covers the statement of profit or loss, the statement of financial position and their respective line items.
3. **Assets**
   This topic examines assets in greater detail. What an asset is, how it is defined, recognised, and disclosed.
4. **Liabilities & Equity**
   This topic is concerned with the financing of an entity's assets, introducing liabilities and equity analogously to assets.
5. **Income and & Expenses / Other Comprehensive Income / Statement of Changes in Equity**
   This topic expands on the statement of profit or loss, disaggregating it into different line items and covers the statement of changes in equity.

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6. **The Statement of Cash Flows**

   This topic covers the preparation of a statement of cash flows, including the different classifications of cash flows, and the information about an entity's survival that can be gleaned from this report. This topic also covered agency theory and earnings management (how accounting techniques can be manipulated to benefit the preparers of the report)

7. **Financial Statement Analysis**

   This topic covered the analysis of the figures in financial statements to make decisions about the health of an entity. Several formulas and relationships were used to conduct the analysis. This is the most numerical topic.

8. **Budgeting**

   This topic covered the preparation and analysis of budgets of different components of their operations.

9. **Cost-Volume-Profit Analysis**

   This topic covered breakeven and cost-volume profit analysis to be used as a tool to compare how different business cost structures influence profit.

10. **Sustainability**

   This topic was delivered by a guest lecturer, Associate Professor Brad Potter and examined how accounting can be used to assess the sustainability of a business.

Lectures

The lectures for ARA were very fast paced and content heavy, covering a large amount of information in a short amount of time. These lectures are essential to be able to understand the course and everything that is examinable is mentioned by the lecturer. Mr Noel Boys is a very seasoned lecture who would make repetitive, yet occasionally hilarious jokes regularly in his lectures, and despite his terrifying stature is one of the most entertaining lectures I have ever had.

The lecture slides are very comprehensive, however the explanations Mr Boys gives are important to write down, as they often contain intricate details about each concept.

Tutorials

Each week there was a 1.5-hour tutorial, covering material from the previous week's lecture. Despite providing a student version of the tutorial slides, most of them don't contain the questions, during the tutorial it is illegal to take photos of the content, so ARA tutorials are an absolute must attend. Additionally, the groups for the group assignment are formed in the tutorial so it is important to attend and find a good group. Before each tutorial, there was a pre-tutorial quiz which was useful to check understanding after the lecture, completion of the quizzes before the tutorial counted towards the tutorial participation mark. The tutorials themselves focused on more long-answer questions that were very helpful for understanding the content.

Assessment

Tutorials

These marks are awarded quite leniently (obviously dependent on the tutor), and easy marks to obtain as long as there has been an attempt of each pre-tutorial quiz before the tutorial, full attendance at the tutorial and a reasonable level of interaction within the tutorial. The assessable tests are very similar to exam style questions, unfortunately answers to these are not provided after completion.

Assignments

The first assignment is an individual assignment on transaction analysis. It is comprised of two parts, Part 1 involves classifying different financial transactions, and Part 2 involves preparing both a statement of profit or loss and a statement of financial position from the answers of Part 1. The correct answers for Part 1 are sent out before Part is completed, so each part's mark is independent of the other. Both parts are completed on excel and each student has completely different data.

The second assignment is a group assignment, again comprised by two parts. Part 1 involves financial analysis of financial statements and is completed on excel. Part 2 was a quiz based on answers from Part 2. To gain full marks each student had to answer each question correctly.

Overall, both assignments were straight forwards and a similar level of difficulty to the tutorials, all the information required to complete them was covered in the lectures.

Exam

The final exam was a 3-hour exam with an additional 15 minutes of reading time. It is an in person, written exam completed in the Exhibition building, no formula sheet was provided, and no notes were allowed to be brought in. The exam was comprised of three sections. Section 1 contained 35 marks of multiple-choice questions. These questions were theory based with few calculations and could range from elementary to tricky and misleading. Section 2 had 30 marks worth of numerical answer questions, with a similar level of difficulty to the assessable tests.

Section 3 was worth 35 marks and required preparation of the statement of financial position, statement of profit or loss and statement of cash flows. Despite being segmented into different questions, each statement requires information from the others, so it is important to learn a good order to approach this part of the exam. Information can be listed in different ways, i.e. computer software = intangible assets, or money owed to other entities = trade payables, so be careful that you know what each line item means. It is also important to know the difference between amortisation/depreciation expenses vs accumulated amortisation/depreciation, how to disclose other comprehensive income, that shares issued is found in the statement of cash flows, and that despite it not being an assessed report, the statement of changes in equity can be a useful tool to create in the exam to ensure that the statements balance. Completing the practice exams is very useful for this section of the exam.

The practice exam (not past exams!) provided are not especially useful for the other sections since most of sections 1 and 2 are repeated verbatim in each of the three exams.

Overall Remarks

ARA is a content heavy subject, but if you put some time and effort into it, it is very manageable. As someone with absolutely no accounting experience, I found that by reading the textbook before each lecture, attending the lectures live (for the full entertaining experience of Mr Noel Boys as your lecturer), actively participating in the tutorials and doing the questions in the textbook enabled me to have a good understanding throughout the whole course. This is especially important, since the exam for ARA is the main event, and with other first year exams, there isn't enough time to be learning content in SWOTVAC. I found that my strategy meant that I could spend SWOTVAC brushing up on the concepts and perfecting my preparation of financial reports. ARA is a very dry and tedious subject, so preparation and doing well on the exam is a must, so you never have to take the subject again.

ECON10004 Introductory Microeconomics [SM1]

Exemption status	CB2 Business Economics, in conjunction with ECON20001 Intermediate Macroeconomics. Satisfactory performance across both subjects is required Also, a prerequisite for the Bachelor of Commerce
Prerequisites	None
Lecturer(s)	A/Prof Maria Recalde A/Prof John Tang
Weekly contact hours	2 × 1-hour lecture 1 × 1-hour tutorial
Assessments	Weekly pre-tutorial quizzes 5% Tutorial participation 5% Assignment 1 15% Assignment 2 15% Final Exam 60% (hurdle)
Textbook Recommendation	Joshua Gans, Stephen King, Martin Byford, N. Gregory Mankiw, 2020, Principles of Microeconomics, 8th edn, Asia-Pacific Edition, Cengage ✓ **Recommended**. If you would like some additional clarifications or real-life case studies on concepts taught
Lecture Capture	Full (both audio and video)
Year and Semester Reviewed	2023 Semester 1

Subject Content

1. **Supply and demand**
   Basic revision of high school supply and demand and comparative statics in perfectly competitive markets. Pretty straightforward even if you've never taken economics before. Just make sure you understand which factors affect supply and which ones affect demand.

2. **Elasticity and welfare**
   Covered price-elasticity of supply and demand as well as income and cross-price elasticity of demand. This nicely mobilised the discussion of the welfare implications of markets and consumer/producer surplus.

3. **Government intervention and international trade**
   How markets adjust to intervention from the government, such as tax, subsidies, and direct forms of regulation. Free trade and how it benefits both trading partners, some better than others, is explored too. While most of what you learn seems straightforward, its importance cannot be understated as this is a commonly assessed topic. Ensure you know the precise effects on social welfare and how to draw the graphs.

4. **Market failures**
   Situations where the market does not maximise social welfare are known as a market failure. In this week of learning, positive and negative externalities and asymmetric information were key topics covered. Compared to the rest, the latter topic was a lot more qualitative, so it is best to understand through reading examples.

5. **Costs of production; competitive markets**

   A very crucial topic is short-run and long-run cost curves, equilibrium, and the profit-maximisation rule. This topic was taught very quickly and may seem confusing at first due to the vast number of curves you have to understand and be able to differentiate from one another - e.g. between the short run and long run, and firm and market. It requires some level of mathematical rigour to understand these curves too. Hence, it is important that you take your time really grasping this topic as the following will build on from this.

6. **Game theory**

   This topic sort of served as an interlude, as most would agree that it is the more 'fun' of the bunch. It mainly covered strategic situations, simultaneous-move games, and methods of finding Nash Equilibria. Understanding these methods takes a while, but once you do it becomes easy to solve. It also has applications in the topic of oligopolies.

7. **Monopolies**

   As directly opposed to perfect competition, this topic now introduces the market structure of a monopoly. It compares the characteristics and cost curves of the monopoly to a perfectly competitive firm.

8. **Monopolistic competition and oligopolies**

   The two other types of imperfect competition are explored here. Monopolistic competition is simple to understand if you are confident with perfect competition and monopolies. Oligopolies, on the other hand, have several types which will seem complicated, but just requires a confident understanding of game theory and the other market structures. A solid foundation in understanding cost curves is also crucial for this topic.

9. **Labour markets**

   Labour demand and supply of competitive/imperfectly competitive firms are considered. Factors that affect supply, demand and wages are explored too. This was an interesting topic and one that is quite different from the rest.

10. **Tax System Design and Economic Ideologies**

    This topic covered the concepts around designing the tax system, types of tax and average vs marginal tax rate. Despite this, you probably will not know how to pay your taxes still. However, another interesting topic covered this week was the types of economic ideologies, which essentially felt like a philosophy lesson. This topic may seem disjoint, but it does have applications related to the topic of game theory.

Lectures

The first half of the semester was taken by Maria, while the latter half was taken by John. There were some mixed opinions regarding both their teaching styles, as they were quite different. While Maria had comprehensive notes in her slides, John would have minimal writing on his. However, his explanations expanded on these brief notes and were more interactive (if you attend in person) whereas Maria's lectures felt more scripted and were mostly read off from the slides. However, it is evident that both lecturers derive most of their notes from GKBM, and it is also an expectation that you do the readings before attending the lectures. There were also fortnightly review sessions held by Nahid Khan which were recorded. These were very helpful as she would clarify concepts, answer questions, and go through practice/past exam questions which helped us understand how the content is applied. I would highly recommend joining these too.

Tutorials

Attendance and participation in these 1hr weekly tutorials are weighted. In these tutorials, the tutor would guide you through how to answer questions related to the previous week's topics, and it often involved group discussions. These questions are uploaded to Canvas the week prior, and they are good to consolidate and

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apply your knowledge. From my experience, what you get out of these tutorials ultimately depends on your tutor and the effort you put in to prepare. I would recommend thoroughly understanding last week's concepts before attending as the tutor will assume you have done the necessary preparation beforehand. There is the opportunity to ask other questions too, but most of the time is spent discussing answers to the prescribed questions.

Assessment

Pre-tutorial quizzes

Each week, a quiz is open Thursday afternoon and due Sunday midnight. The quiz is usually 10-20 multiple choice questions designed to test your understanding of the week's content. There is no time limit, but you are only given two attempts and your best 9 (out of 11) quiz results will count towards your 5%. The questions are not difficult and were often taken directly from the textbook - so the answers can be found easily if you do the readings or simply pay attention during the lectures. Occasionally, some questions were trickier because they were not directly taught, but still doable. Ultimately, these quizzes are very low stakes but still a good resource to put your skills to the test.

Tutorial participation

Your tutor will decide on a grade for you based on your participation during tutorials across the twelve weeks. From my experience, most students do not actively participate during tutorials so it may be daunting to contribute, but ultimately it will help you achieve the extra 5% towards your grade.

Assignment 1

Our first assignment was based on the first four topics. It was graded out of 100 marks and had a limit of 1000 words. The questions themselves were straightforward and there weren't any deliberate tricks or difficult questions. There is not much guidance offered nor were we taught how to structure our answers, so most of the confusion arose out of this. For this reason, Ed Discussion became a very hot platform for students to ask questions about the assignment, and the tutors were often quick to reply and give helpful advice - so I'd highly recommend checking these as you do the assignment. Otherwise, the grading was very lenient, and most people were happy with their scores.

Assignment 2

Pretty much the same as the first assignment but covering the second half of the course (except for the last two topics). This one was probably harder because of the topics themselves, not necessarily because of the questions. For example, there were a lot more calculations involved, and it was necessary that you show all working out. The graphs and game trees also had to be drawn in specific ways. Again, Ed Discussion is a helpful resource if you have questions about the assignment - although it does become very busy nearing the deadline so check it early!

End of semester exam

This in-person exam is 2 hours, allowed a scientific calculator and no notes. It was structured such that there were 10 multiple choice questions, and a short answer and extended response section. Also, there is a hurdle requirement in which students must pass the exam to pass the subject. Most would agree that this year's exam was challenging. It was a mix of easy and difficult questions - with the 'difficult' questions requiring a lot of calculations. Since there was not much practice offered for these sorts of questions, it became quite time-consuming to think about how to approach solving them in a way that makes theoretical and mathematical sense. Ultimately, I would recommend not spending too much time on perfecting any one question. Also, in your exam revision, try to practice more calculation-based rather than written responses. A document of past exam questions was the only resource made available to us on Canvas and, while it was very helpful, may not

be enough for some. Hence, reviewing your assignments and consulting past exams from other sources is recommended too - although, do be aware that the content and expected answer styles do change across the years.

Overall Remarks

Introductory microeconomics serves as a nice subject to introduce you to economics, which may either cement your love for the subject or deter you from pursuing it as a major. Despite the challenging aspect of it, it is still a fascinating subject which prompts you to think about how the theory you learn can be seen in real-life - from business interactions to daily life choices. It is also easy to do well in the assignments and quizzes, so try to give your best effort when doing these.

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ECON10003 Introductory Macroeconomics [SM2]

Exemption status	Not an exemption subject, but it is a compulsory subject for the *Bachelor of Commerce,* and a prerequisite for *ECON20001 Intermediate Macroeconomics*
Prerequisites	None
Lecturer(s)	Prof Chris Edmond
Weekly contact hours	2 x 1-hour lecture 1 x 1-hour tutorial
Assessments	Online MCQ test #1 5% Online MCQ test #2 5% Assessment 1 12.5% Assessment 2 12.5% Final Exam 60% (hurdle)
Textbook Recommendation	Ben Bernanke, Nilss Olekalns, Robert H. Frank, 2019, Principles of Macroeconomics, 5th edn, McGraw Hill Education ✓ Recommended. Although the lectures contain all necessary information, many found that the lecturer was quite poor at explaining in a universally simple and easy to understand manner. Personally, I would suggest online resources such as Khan academy as a supplement for a smoother learning experience.
Lecture Capture	Full (both audio and video)
Year and Semester Reviewed	2023 Semester 2

Subject Content

1. Fundamental concepts
   Focuses on different measurements of economic activity (i.e. GDP), introduces the idea of inflation, interest rates, and unemployment.
2. Short-run macroeconomics
   Much like how it sounds, this part focuses on modelling the economy on a short-run, and the economic impacts of fiscal and monetary policies. This section overlaps most with ECON10004 Introductory microeconomics, as it also looks at how consumer, producer and overall surpluses react to different policies.
3. Long-run macroeconomics
   Modelling long-run effects of changes in national savings, capital, and how they interact with the aggregate economic activity of a country.

Each of the subsequent topics were built up on the preceding topics, while the most basics concepts were covered at the start, they were the concepts most applied. For example, the different measurements of gross domestic product. Most facts had an intuitive basis however a few facts were required to be rote learned and memorised. Overall, the content was not very reliant on any prerequisites, as any content overlapping with microeconomics were taught from the ground up again. I strongly recommend revisiting past topics as they appear in subsequent topics far more than what is normally expected.

Lectures

There were usually no recaps at the start of lectures. I personally found it quite difficult to engage with the lectures as it was a lot of content and a few discussions about the concept at play in real life events. There were very few worked examples compared to other subjects, so I recommend attending the tutorials as tute sheet answers were not posted on canvas. At the very least I recommend having a few friends to share the tute sheet answers with. The lectures were not worth attending physically as they were fully recorded however, I recommend physical attendance to stay engaged. The lecture slides were also available on Canvas. Pre lecture preparations were not expected.

Tutorials

Tutorials began on the second week of semester and the tutorial participation accounted for 5% of the overall subject grade. There was no material exclusively taught in tutorials, as the tutorial sheets were posted on canvas. However, the solutions to those tutorial sheets were not available unless you attended the tutorials. As such, I recommend attending the tutorials to keep up the practice. There was no preparation required for the tutorials. I strongly recommend having friends who are also doing this subject, so that you can share tutorial solutions between each other when someone is inadvertently unable to attend. Through this, it is very easy to make up for missed tutorials.

Assessment

Online quizzes
The online quizzes were very straightforward and almost all my peers considered it "easy" if you keep up to date with the lecture material.

Assignments
Both assignments for this subject were quite open ended and very similar, we were allowed to choose groups of up to 3 or even work individually for both assignments. Most of the time spent working on these assignments were on collecting data from government surveys and manipulating data on excel. There were word limits on both assignments however it was quite easy to stay under the limit. The questions in the assignments were vastly different to tute/exam questions as they were very open ended. The assignments may prove to be difficult in finding the data, however besides this the rest was fairly "do-able". I believe the marking of these assignments were quite subjective to the tutor, as some were very lenient, and some were stringent. I do not believe what I learnt from these assignments were useful for the subject exams/tutorials.

Final exam
The final examination for this subject was very similar to the previous ones available to us for practice, with a few questions almost "copy-pasted" in the concept examined. No summary sheet was allowed as the lecturer did not believe in rote memorising formulae however almost every formula/equation required for a question was given in the preamble. This exam covered topics from the entire semester and were like the more difficult tutorial questions. About 4 practice exams were provided however I believed this to be an ample amount when combined with the tutorial sheets. The extended response section included 4 questions on different topics, and only 2 (any 2 from the student's discretion) were required to be completed.

Overall Remarks

Ultimately ECON10003 was a very standard subject, it was quite difficult to find enjoyment around the start of the subject however when the different topics started weaving into each other the material become far more interesting. The lecturer wasn't great at making the material enjoyable either, so your performance depends

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very much on yourself. I strongly recommend completing all tutorial sheets (even if you don't attend them physically), and all the practice exams available. It was very helpful to review the past lecture notes during exam preparation as it gave me a better view of what was "actually happening" in the subject. The most important tip: make sure you have other friends who are also doing this subject with you so you can have someone to rely on for any missed tutorials/assignment questions.

FNCE10002 Principles of Finance [SM2]

Exemption status	CB1 Business Finance, in conjunction with ACCT1002 *Introductory Financial Accounting*. Satisfactory performance across the three subjects is required
Prerequisites	None
Lecturer(s)	A/Prof Sean Pinder
Weekly contact hours	1 × 2-hour lectur 1 × 1 hour tutorial
Assessments	Peer Reviewed Questions 4 x 3.75% Mid-Semester Exam 25% End of Semester Exam 60%
Textbook Recommendation	Brindha Gunasingham, Christopher Adam, John Graham, 2020, Corporate Finance, 3rd edn, Cengage ✗ **Not recommended**. While the content can be examinable, I found the lecture slides to be clear and thorough enough
Lecture Capture	Full (both audio and video)
Year and Semester Reviewed	2023 Semester 2

Subject Content

Principles of Finance serves as a first introduction to key finance concepts and theories. It covers many important topics without being overly in-depth and is generally accessible for students with no prior finance knowledge.

1. Introduction to Financial Mathematics I and II
   This topic introduced the fundamental concept of time value of money and discounting cash flows. The second part teaches you to work with annuities and perpetuities, which is all mathematical. There are lots of formulas, but they are on the formula sheet. I recommend going to the tutorial if you are stuck on this topic as the concepts learnt here carries onto following topics.
2. Debt Securities
   Debt securities encompasses short-term and long-term debt, and it mostly deals with pricing bonds and understanding yields. It was interesting to learn about how certain debt securities differ and even some history about it.
3. Equity Securities
   This topic looks at the types/characteristics of equity and how it can be priced using the Dividend Growth Model. It also touched on information and market efficiency. This topic was interesting as it drew on real-world data and examples.
4. Portfolio Theory and Asset Pricing I and II
   This topic is a little more numerical as there are a few formulas. It deals with risk and return, diversification, and probability measures. The latter half is slightly more difficult to grasp due to it being very new, introducing the concept of leverage, systematic vs unsystematic risk and CAPM. There are a few new graphs introduced here.
5. Capital Budgeting I and II

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Capital budgeting involves assessing the appropriateness/wealth-generating effects of projects through evaluating its NPV. It also introduces various other methods and ways of assessing projects with different lives.

6. Capital Structure and Payout Policy I and II
   This topic looks at the impact of financial leverage, taxes, and payout policies. It looks at both empirical and theoretical evidence to either support or reject certain statements.

7. Introduction to Options (Financial Derivatives)
   A very brief overview of option profits versus payoffs and drivers of option values. This topic is often a pain point for students, or it is simply neglected, because it is the final topic and is quite disjoint from the rest. Options tends to be confusing to learn for the first time too.

Lectures

Sean Pinder's lectures were clear and concise despite running at a faster pace. He is also very engaging and makes his in-person lectures interactive; he would demonstrate examples with students and spend time doing 'TAPPS' exercises. However, these exercises, which are essentially practice questions to consolidate knowledge, were not recorded which is why he consistently urges for in-person attendance (although I did not). He also suggests that you review the lecture slides prior to watching the lecture, which I believe would be helpful as some topics take longer to grasp. I found all the information in the annotated lecture slides to be relevant and examinable too.

Tutorials

Tutorial attendance is not assessable in this subject. The tutorial questions are uploaded at the start of each week and solutions are released on the weekend. I highly recommend doing all the questions and checking your answers as a gauge of mid-semester test and exam difficulty. Attending the tutorials is useful if you have questions, and I found my tutor to be very pleasant and helpful which is why I consistently attended anyway. I would also recommend attempting the problems before your tutorial if you do attend as they do go through all the questions quickly.

Assessment

Five sets of peer-review tasks (The best four contribute to the grade)
Around every fortnight, an ExamBuddy! Task (two questions relating to the last topic you've learnt) is released, and you would get two weeks to upload your written answers and anonymously review somebody else's answers. The questions resembled exam-style questions and marks are awarded purely for making a genuine attempt. There is no penalty for getting an answer wrong and the best three out of four marks contribute to the final score. Therefore, this was a very low-stakes assignment, and most people tend to do very well. I also liked this assignment as the solutions, which are released immediately after submission, allowed me to check my responses and served as early exam preparation.

Mid-semester Exam
The one-hour mid-semester test consisted of 25 multiple choice questions related to the first half of the course. Only a calculator and the provided formula sheet is allowed. The questions usually weren't difficult except for one or two which may require you to draw on topics that were only briefly mentioned or require some higher level of precision in your calculations. Most people tend to score well, and full marks is achievable if you read the questions carefully and do the practice material/review all the info in the lecture slides.

End-of-semester Exam

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The two-hour, closed book exam was neither too easy nor too difficult. A very comprehensive formula sheet is provided too, so emphasis is placed on understanding theory. The 2023 exam was structured such that the first third was True/False style questions which prompt brief explanation, followed by multiple choice and then a calculations/written response section. All topics were assessed, and Sean makes exam preparation easy by releasing the mark distribution across the topics which helps guide your studies – although I'd still suggest brushing up on all content as the 'niche' topics may come up. A few practice exams are provided alongside plenty of online/in-person consultation sessions. It is also recommended to make use of the tutorial questions for practice – although I found the exam questions to be more straightforward. All in all, I was satisfied with the exam.

Overall Remarks

Sean Pinder was, by a mile, my favourite lecturer of the semester. He demonstrates passion for the subject and genuine care for his students, as reflected in his goodwill and fairness in assignments. He is one of the few subject coordinators who punctually emails result updates (and even study tips!). He is also highly organised and always welcomes questions. It is no wonder why many people enjoy the subject and score well, as reflected in the vast number of students who achieve a H1.

I thoroughly enjoyed the content taught in Principles of Finance, albeit not very applicable in a personal context. To me, it was interesting because it cleared up some common misconceptions in finance.

I scored highly but I can only attribute it to my genuine interest in the subject and subsequent motivation to study via seeking out practice materials. I do concede that Principles of Finance is not all easy, which is especially true for those who have a dislike for the content, but I can only recommend taking your time to really understand the concepts to a point where you feel comfortable explaining it to others.

ACTL10001 Introduction to Actuarial Studies [SM1]

Exemption status	None
Prerequisites	None
Lecturer(s)	Prof David Pitt
Weekly contact hours	2 × 2-hour lecture 1 × 1-hour tutorial
Assessments	Assignment 1 10% Assignment 2 10% Mid-Semester Exam 10% Final Exam (hurdle) 70%
Textbook Recommendation	M.E Atkinson, D.C.M Dickson, 2011, 2nd edn, Edward Elgar Publishing ✗ **Not recommended**. Lecture slides and tutorial questions provide a very in-depth explanation of every topic, so there is no need to use this textbook as a supplement.
Lecture Capture	Full (both audio and video)
Year and Semester Reviewed	2023 Semester 2

Subject Content

This subject aims to provide insights into the actuarial profession, covering both the basic techniques used by actuaries and the mains areas of actuarial work. This subject is mainly focused on life insurance over other actuarial fields, such as general insurance and risk management.

1. Financial Mathematics.
   This topic accounts for the first four weeks, covering simple interest/discount, compound interest, annuities, bonds, and loans. Parts of this topic is shared with FNCE10002 Principles of Finance, but ACTL10001 goes more in-depth and uses actuarial notations.
2. Demography and Survival Analysis
   This topic goes for 3 weeks, covering features of populations through ratios and population pyramids, lifetable, mortality, fertility, and population projections. More actuarial notations are introduced, and it is essential to fully understand the content of this topic as it is heavily used in upcoming topics.
3. Life insurance Mathematics
   This topic goes for 3 weeks, covering contingent payments, different types of life insurance products, pricing and reserving in life insurance, and profit analysis. This is arguably the most challenging topic in ACTL10001.
4. Applications
   This topic accounts for the last two weeks of the semester, covering basic concepts in general and reinsurance concepts, superannuation, and reverse mortgages.

Lectures

Lectures are delivered in person and livestreamed and recorded online. The lectures are very organised. David's explanation of concepts is very easy to follow, and there are plenty of in-lecture practice questions to

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supplement your learning. I had no difficulty watching the lectures online, as David usually prints out the lectures slides on paper and livestreams it using the overhead camera. He also uses a pen to trace on the paper when he is explaining, which makes the online lecture experience very intuitive.

Tutorials

Attendance in tutorials were not marked this semester. Students could attend any tutorials (timetable on handbook) to make up for their missed destinated tutorials. Tutorials begin on the first week of the semester. The first tutorial covers math concepts such as derivation of the geometric progression formula from first principal, and applications of Taylor Polynomial, which some students have not been exposed to previously and found challenging. During the tutorials, students are broken into groups to attempt questions on the whiteboard. Then the tutor goes through each of the questions together as a class.

The best way to prepare for the tutorials is to attempt all the questions before the tutorial and revising if necessary. It is also recommended to write summary notes for lecture contents and those can be used in mid-sem or exam (subject to exam policy).

Assessment

Assignment 1
Assignment one contains 6 questions which require students to apply the skills learnt in the first four weeks of the semester (Financial Mathematics). Questions includes annuities, bonds, loans, and continuous compounding interest.

Assignment 2
Assignment two requires students to record a short presentation on the topic "What is an actuary?" for 4-5 minutes. This assignment is relatively straightforward and requires less time than assignment 1. Since no assignments cover the week 5-12 content, additional practice material is posted on Ed discussion.

Mid-Semester and End-of-Semester exams
The mid-semester test constitutes 10% of the overall mark. The test is conducted in week 9 and only covers content up week 6. Students are permitted to bring one A4 page of notes, handwritten or printed on both sides and a permitted calculator. Most students found timing as a big challenge – there is only 45 minutes of writing time this semester with a total of 10 questions.

The end-of-semester exam is 2 hours in length, timing is not a big concern. Tutorial sheets and the 2 practice exams are ample revision for the calculation questions. The exam, however, contains general theory to actuarial practice. Therefore, students may need to go back and go over the lecture slides to brush up on those concepts.

Overall Remarks

From my point of view, I think the difficult of this subject on par with other first year commerce subjects. Students are highly rewarded if they are up to date with lectures and tutorials each week and do the two practice exams for end-of-semester exam revision. Even though I scored poorly on the midterm, I still managed to obtain a H1 in the end. Since this subject is not an exemption subject nor a compulsory subject for Actuarial Science major, students could choose not to take on this subject.

MAST10006 Calculus 2 [SM1]

Exemption status	Not an exemption subject, but it is a prerequisite for ACTL20001 *Introductory Financial Mathematics* (CM1 Actuarial Mathematics I)
Prerequisites	A study score of at least 29 in VCE Specialist Mathematics 3/4, or equivalent OR MAST10005 Calculus 1
Lecturer(s)	Dr Anthony Morphett Prof Aleks Owczarek Prof Sanming Zhou
Weekly contact hours	3 × 1-hour lecture 1 × 1 hour tutorial
Assessments	Weekly Written and Online Assignments 20% Final Exam 80%
Textbook Recommendation	None
Lecture Capture	Full (both audio and video)
Year and Semester Reviewed	2023 Semester 1

Comments

The prerequisite for MAST10006 Calculus 2 is a study score of at least 29 in VCE Specialist Mathematics or equivalent, or completion of MAST10005 Calculus 1 or MAST10007 Linear Algebra.

A rewarding subject that extends the basics you learn in Specialist 3/4. It prepares you well for assignment and exam questions and there are enough exercises provided for you to achieve a high score.

Subject Content

1. Sequences and Series Introduction to limits
   One of the harder topics covered in Calculus however 3 weeks are spent on it, so it is doable.
2. Hyperbolic Functions
   Introduction to the hyperbolic functions and identities. some new content however like content learned in Specialist 3/4
3. Complex Numbers
   Short section on Complex numbers and I personally found it easier than complex numbers in specialist 3/4
4. Integration
   One of the more important parts of the course as it is the foundation for the coming topics. Not too difficult.
5. First Order Differential Equations
   First order differential equations and how to solve them along with practical examples.
6. Second Order Differential Equations
   Second order differential equations and how to solve them along with practical examples.
7. Functions of two variables
   Introduction to the x,y,z plane and how to calculate gradients, tangents, tangent planes and areas on the x,y,z plane. This is the hardest, but I found it the most enjoyable.

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Lectures

There are 3 lectures every week and 3 different streams. Lecture slides explains concepts and goes through practice questions that are very similar to the assignment questions and exam questions, so they are very helpful. However, make sure to attend a lecturer that suits your learning style.

Tutorials

Tutorials are not compulsory however the most beneficial part of calculus 2. You are in a small class with one tutor going through example questions in groups. These questions are again every like assignment and exam questions.

Assessment

9 weekly assignments. 6 are written and 3 are done online using Webwork. Only the best 8 assignments will count it makes up 20% of your final grade.

There are weekly assignments based on the previous week's content. These assignments are easy as they are almost identical to lecture examples.

The end of year exam is worth 80% of your grade however is not a hurdle task. Time is not too much on issue and you can take a double sided a4 sheet as a reference sheet and a formula sheet is provided.

MAST10007 Linear Algebra [SM1]

Exemption status	Not an exemption subject, but it is a prerequisite for ACTL20001 *Introductory Financial Mathematics* (CM1 Actuarial Mathematics I)
Prerequisites	A study score of at least 27 in VCE Specialist Mathematics ¾ or equivalent OR MAST10005 Calculus 1
Lecturer(s)	A/Prof Dr. Nora Ganter Mr Christian Haesemeyer
Weekly contact hours	3 × 1-hour lecture 1 × 1 hour tutorial 1 x 1 hour lab tutorial
Assessments	Weekly Online and Written Assessments 20% Lab (MATLAB) Test 10% Final Exam 70%
Textbook Recommendation	None
Lecture Capture	Full (both audio and video)
Year and Semester Reviewed	2023 Semester 1

Subject Content

Linear algebra, while a relatively difficult subject is one that a student will be able to achieve success in through consistent practice and content revision. The techniques learnt throughout repeat themselves so if they are mastered early, a student will have a far greater chance of success. While a prerequisite for the subject is a score of at least 27 in VCE Specialist Mathematics, the course content seldom relies on a student's knowledge of it.

1. Matrices and Vectors
   The first section of the subject provides students with an introduction (or reintroduction) to the some of the matrix and vector definitions, types and relevant manipulation techniques that will repeat themselves multiple times throughout the course. The most important subsections within this section include matrix and vector multiplication, vector projections, distances, transpose matrices and the dot product (later redefined as an inner product).
2. Linear Equations
   This section introduces a technique used in many of the future course content; the Gauss-Jordan algorithm. This technique allows for the solving of complex simultaneous equations as well as determining a matrix's rank and nullity and as a result, it is recommended that a student becomes proficient in using the Gauss-Jordan algorithm.
3. Vector Spaces and Linear Transformations
   Section 3 of the course introduces a student to content heavy subjects such as vector spaces and subspaces, linear combinations, and linear transformations and as a result memorisation of definitions and rules and how these can be applied when answering questions is important. Once the topics within this section are mastered then most questions relating to them within are straightforward as they become repetitive.
4. Bases and Dimension

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This is the section with the most difficult content in the entire course, introducing students to the concepts of coordinates and bases, changes of coordinates to different bases and the four fundamental matrix subspaces. The topics in this section require a student to do a wide variety of practice questions to be able to understand the content being taught.

5. Inner Products

This section introduces students to inner products and inner product spaces, as well as applications of these such as the Gram-Schmidt algorithm and the cross-product. Like section 3, questions related to the topics in this section become relatively straightforward when definitions and processes are memorised as again, they become repetitive.

6. Eigenvalues and Eigenvectors

The last section is one of the more straightforward of the entire course, with students being introduced to eigenvalues and their corresponding eigenvectors as well as the concepts of diagonalisation, matrix powers and real symmetric matrices. To become proficient in these topics, it is recommended that students complete practice questions until they are comfortable.

Lectures

Mr Christian Haesemeyer's lectures (one of two lecture streams, A/Prof Ganter's lectures may be different) were delivered clearly and with a level of depth and pacing that made his lectures engaging to all students present. All lecture content was available to students whether they attended in person or via lecture capture. The structure of each lecture followed the lecture slides (available on the LMS) with each one introducing content followed by worked examples, meaning there was very little preparation required from a student other than reviewing previous content.

Tutorials

The tutorials each week were split into one practical (starting week one) and a computer lab session (starting week 2), with each lesson requiring knowledge from the previous week's lectures. Preparation for each tutorial was not required tutorial attendance was not necessary if the problem sets were completed, and the content was learned. If a tutorial was missed, a student could easily make up for this by attending another one.

Assessment

Weekly Online and Written Assignments
Throughout the subject, there were 9 weekly assignments that made up a total of 20% of a student's final grade. They were released and 12pm every Monday and due exactly one week later, with three being online assignments (using WebWork) and 6 being written assignments. The assignments had a relatively high degree of difficulty compared to the tutorial sheets and the eventual exam and while meant to be individual, discussion of the questions between students was encouraged if the final submissions were a student's own work (in accordance with the university's plagiarism policy). The marking of the assignments was relatively harsh however there was no hurdle mark requirement on assignments to pass the course. Overall, the assignments bring a positive experience that allows a student to better learn the content.

MATLAB Test
At the end of the semester there was an online test done during the last lab practical of the course. This test was relatively difficult compared to the lab sheets and practice test provided and results were likely unscaled. It was closed book with no materials allowed outside MATLAB, a pen and a blank A4 sheet of paper. In the test a student should expect to see questions requiring them to reduce a matrix to reduced row-echelon form,

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change the base of a set of coordinates and to find eigenvalues and their corresponding eigenvectors. The remaining questions asses varying topics taught throughout the course.

Final Exam

The final assessment in the course was a 3-hour exam that covered all the content covered throughout the course. Students were allowed one double sided A4 sheet of notes which proved useful in navigating the exam, which had a medium to high level of difficulty. The general performance of the cohort seemed to be mixed, with results spread fairly across the grade brackets however this may be the case due to the existence of scaling of results. Unlike the assignments, the exam largely focused on the content taught throughout the course rather than applications of this content.

Overall Remarks

Despite the difficulty of the subject, success in the subject can be achieved through consistent practice and content revision. It is a subject where a student will get out what they put in, meaning a high mark is not exclusive to those at the top of the cohort or those who achieved high marks in their prerequisites. Some mistakes to avoid to best prepare one for assignments and the exam include not actively attending/watching lectures, not completing the tutorial and lab sheets and actively communicating with other students when struggling with questions. Marks below expectations on the assignments/MATLAB test can be recovered in the exam due to its high weight and scaling.

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MAST10008 Accelerated Mathematics 1 [SM1]

Exemption status	Not an exemption subject, but it is a prerequisite for ACTL20001 *Introductory Financial Mathematics* (CM1 Actuarial Mathematics I)
Prerequisites	A study score of at least 38 in VCE Specialist Mathematics ¾ or equivalent
Lecturer(s)	A/Prof Alexandru Ghitza
Weekly contact hours	4 × 1-hour lecture 1 × 1-hour tutorial 1 x 1-hour lab tutorial
Assessments	3 x Online Assignments 7.5% 3 x Written Assignments 7.5% Lab (MATLAB) Test 5% Final Exam 80%
Textbook Recommendation	Anton, H, & Rorres C, 2013, Elementary Linear Algebra, Applications Version, 11th edn, Wiley ✗ **Not recommended**. The textbook may give you more questions to practice with, but the supplied lectures and question topic sheets give you more than enough information and questions to get a good grasp at the topics.
Lecture Capture	Full (both audio and video)
Year and Semester Reviewed	2023 Semester 1

Subject Content

1. Introduction to rigorous mathematics
   Briefly revised complex numbers, but also extended to the different proof techniques. This was a new topic to most so practice helps to identify which technique should be used. Sets, countable sets, and functions were also covered. Seeing Alex work through examples and doing them yourself via the self-study problems is helpful in grasping this topic.
2. Matrices and linear equations
   This topic plus the next make up the bulk of the course. It's essentially what's taught in linear algebra. We covered linear systems, elementary row operations, reduced row echelon forms, matrix arithmetic and determinants. This topic was straightforward but does take some time to get used to if you haven't worked with matrices before.
3. Vector spaces and linear transformations
   It covered arithmetic operations on vectors, vector spaces, linear transformations, bases, and eigenvectors. This was probably the longest topic and I personally found it quite overwhelming because of the sheer amount of information which all sort of overlapped. The way in which this topic was taught made logical sense, but because it was all connected, information felt scattered so a solid foundation from the last topic and patience is recommended to fully digest this one.
4. Inner product spaces

A short topic, covering inner product spaces, orthogonality, and orthogonal projections. While it is short, it is also commonly assessed and one that may not be very intuitive so, again, requires some patience to understand.

5. Some applications

   This topic showed some ways to apply vectors and matrices to solving problems, and covered solid geometry like the cross product, lines, and planes. Sort of a 'relief' topic as most of it was quite methodical and somewhat independent from the previous.

6. Introduction to multivariable calculus

   Very different to the other topics and taught very quickly and briefly as it was the last one. Started off with understanding functions in two variables and limits to partial derivatives and chain rule. While it all sounds very familiar, its applications are quite different as it involved visualising three-dimensional planes and geometry. Directional derivatives, stationary points and double integrals were also a part of this topic. There wasn't much time offered to us to thoroughly understand the topic, but this also wasn't very crucial compared to the others.

Lectures

Alex is an engaging lecturer and teaches in a way that makes it easy for us to understand. The 4 lectures (Monday, Wednesday, Thursday, Friday), while it is a lot, did not feel that way and it is taught at a digestible pace. I recommend having a touchscreen device or printed lecture slides to annotate as Alex fills them in. Also, personally, sometimes his explanations were not the most clear or intuitive to me so I found that I could not solely rely on the lecture slides/recordings, hence why it may be helpful to consult other textbooks or videos.

Tutorials

The computer lab and practical do not have compulsory attendance but are good to attend if you have questions. The 1-hour 'tutorial' involved us splitting up into small groups working on practice questions to apply theory learnt from the previous week. It was very independent and often not much guidance was offered unless you ask your tutor for help, but the discussion between students does help you consolidate your understanding a bit. The 1-hour computer lab was pretty much all in preparation for the week 12 MATLAB test, but also not compulsory to attend as you can do it at home (all uploaded to Canvas). Again, it is very self-led as you're given a worksheet to work through while the tutor walks around to observe and answer any questions. The worksheet provides very straightforward and comprehensive instructions on how to use MATLAB and familiarise yourself with the language, which is helpful for someone with no prior experience.

Assessment

Online Assignments

There were three webwork assignments spread evenly throughout the semester. They were all quite low stakes as you were given 3 attempts for each question, with no time limit. The questions themselves were also straightforward if you understand the content. These assignments usually stay open for a week which is plenty of time.

Written Assignments

These assignments are usually open at the end of 'big' topics. They were more challenging and non-standard in that the questions required you to think more 'abstract'. Some questions were more standard though, and some written assignments were easier than others too. It is challenging but ultimately very low stakes, so best

to approach it as an opportunity to practice applying what you've learnt to 'extended response' style questions.

MATLAB test
The test is 45 minutes and questions are provided and answered on Webwork but solved using MATLAB. It is conducted in your usual computer lab session. There is a practice MATLAB test available the week prior. It also helps to consolidate the worksheets handed out from previous weeks to familiarise yourself with MATLAB. The test itself isn't difficult and reflects the types of questions you'd have solved during these computer labs, except the time limit was kind of tight - and I'd imagine it would be harder if you weren't entirely comfortable with operating MATLAB or if your conceptual understanding still had loose ends.

Exam
The exam was in-person and 3 hours, allowing one double-sided A4 page of notes and no calculator. The exam is less daunting than one would presume. The types of questions you'd get are also very similar to previous exams, except for some new but approachable questions. For example, there were a few 'give an example' questions that you can't really predict and were time-consuming but ultimately doable if you understand what's being asked. I would recommend doing the past exams made available by Alex at the start of week 12 and ensuring that you are comfortable with all topics by understanding them rather than rote learning methods to solve them. Doing the self-study problems also helps if you have any weaknesses. Three hours is appropriate in that it allowed me to finish on time without feeling rushed but did not offer me extra time either.

Overall Remarks

AM1 is quite a content-heavy and fast-paced subject that requires a lot of self-motivation and independent learning to stay up to date. I'd strongly recommend that you do not fall behind in this subject. Of course, you'll probably end up watching lectures in your own time but try not to let them pile up as it becomes difficult to catch up. Importantly too, try to actively listen and understand the concepts rather than passively copy notes - as this will make approaching the assignments and exams a lot easier!! Also, don't be afraid to ask questions to your tutors, attend consultations and post on the Ed Discussion board. Overall, AM1 can be a very rewarding subject as long as you stay motivated to learn and exercise self-discipline; in fact, it is not as scary as it sounds, and most of it overlaps with Linear Algebra.

MAST10009 Accelerated Mathematics 2 [SM2]

Exemption status	Not an exemption subject, but it is a prerequisite for ACTL20001 *Introductory Financial Mathematics* (CM1 Actuarial Mathematics I)
Prerequisites	A study score of at least 38 in VCE Specialist Mathematics ¾ or equivalent
Lecturer(s)	Prof Jan de Gier
Weekly contact hours	4 × 1-hour lecture 1 × 1-hour tutorial
Assessments	Assessment 1 5% Assessment 2 5% Mid-Semester Exam 10% Final Exam 80%
Textbook Recommendation	Hughes, B, 2023, MAST10009 Accelerated Mathematics 2 Textbook ✓ Recommended. There is no external textbook however the given textbook is tailored for this subject and gives explanations and examples to all the content.
Lecture Capture	Full (both audio and video) *worked examples are not recorded
Year and Semester Reviewed	2023 Semester 2

Comments

The highly rigorous and fast-paced nature of the subject can be overwhelming at times. Keeping up with lectures will already be a challenge. Finding study buddies and attempting as many practice questions as possible will be very beneficial. This subject is designed to test your understanding and methodology making thoroughness during study very important.

Subject Content

MAST10009 Accelerated Mathematics 2, builds on MAST10008 Accelerated Mathematics 1, to cover prerequisites for 3 mathematics subjects, being MAST10005 Linear Algebra, MAST10006 Calculus 2, and MAST20006 Real Analysis.

This subject will be one of the most challenging subjects in your entire undergraduate degree. The content may not be the most advanced but the pace at which you learn is what you expect given MAST10009 covers topics from both Calculus 2 and Real Analysis. The topics covered are very interesting but often requires deep thinking and time to fully understand. Keeping up to date was a challenge, however, given the structured manner Jan employs, students can easily track their progress.

1. Sequences
   The first six lectures of this subject are said to be very challenging. This is because students are introduced to Real Analysis, in particular, the concepts of convergence, divergence, asymptotic behaviour, and limits. Constructing epsilon proofs will be difficult but will come with time. The understanding and methodology developed will be significant as later topics build upon these concepts.

2. Functions, Limits and Continuity

The concepts in sequences are applied to functions. This will be relatively similar so if students understand previous concepts, this shouldn't be too difficult. You'll begin to find that this subject takes familiar concepts but builds them up from scratch. The proofs and thinking behind topics may be a bit pedantic but will deepen your mathematical understanding. These ideas are heavily assessed.

3. Differential Calculus

This topic builds upon high-school calculus, looking at differentiation through first principles, and introducing new theorems such as L'Hopital's Rule, and the Mean Value Theorem (which are all proved rigorously). On top of these theorems, hyperbolic trigonometric functions are also covered, looking at identities and converting between different forms of these functions.

4. Integral Calculus

Jan will cover the idea of Reimann Sums and Reimann Integrability along with Darboux Integrals. These lectures are quite content heavy and will be appreciated with maturity. Finishing off, Jan covers techniques such as integration by parts and different substitution integrals. This will be relatively straightforward, especially with practice.

5. Differential Equations

This topic looks at the different types of differential equations and how to approach and solve these equations. Some differential equations include population growth, motion, and drag, and electric circuits. This topic will be one of the easiest but understanding the mathematics will prove very useful. Differential equations are generally heavily assessed too.

6. Improper Integrals

This explores integrals where the integrand function may be undefined or where a terminal for the integral is infinity. After defining improper integrals, this topic then covers various tests in assessing improper Riemann integrability. This is a very interesting topic; may require a bit more effort to understand.

7. Infinite Series

This topic revisits the content at the start of the subject, looking at infinite series of both sequences and functions. This topic focuses on conceptual understanding and determining the convergence or divergence of series using various tests. This topic also contains various definitions, which will need to be recalled during assessments throughout the semester. Not a hard topic after some practice.

Lectures

Lectures are very fast-paced, and content heavy delivered through four 1-hour lectures throughout the week. In every lecture, Jan will cover a few worked examples illustrating nuances and important subtleties which aren't recorded so definitely attend lectures in person if possible. The lectures are very structured as you'll see in the textbook. The textbook essentially acts as the lecture slides and is very comprehensive. It is highly recommended to use the textbook in tandem with lectures, reading ahead when you can. Jan is a fantastic lecturer, staying behind to answer questions every time and genuinely tries to help you understand the content.

Tutorials

The tutorials for MAST10009 Accelerated Mathematics 2 were not compulsory, however, were a good resource to ask questions and seek clarification. Tutorials had no extra teaching, rather students had a chance to collaborate with others to solve chosen questions from the textbook. If you had no trouble working through and answering the questions on your own, tutorials might prove to be rather unhelpful.

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Assessment

There were two assignments spread over the semester, each worth 5% of your total grade. These assignments were quite difficult compared to the examples covered in class and problems in the textbook, and as Jan requires a high level of rigour and precision, the assignment is difficult to wholly complete. Each assignment was due within two weeks, and given the difficulty of some questions, leaving the assignment to the last couple of days is not recommended.

Assignment 1
Only covered content from the first two topics, Sequences and Functions, Limits and Continuity. This semester, assignment 1 was very challenging. Jan designed questions to really test the methodology of how students approached questions. There was a large emphasis on the rigour of proofs and answers. Keep in mind that these assignments are meant to challenge you and further your understanding. As a rough benchmark, the average mark was 64%. Don't stress too much about the mark and just try to understand what each question is testing you on.

Assignment 2
Covered much less Real Analysis and focused heavily on the Calculus 2 topics in the subject. Questions were primarily about Differential Equations, but also Differential Calculus and Integral Calculus. This assignment was much easier in comparison and students could score very highly.

Mid-Semester Exam
A 45-minute supervised test which was worth 10% of the final grade. This semester the MST was very challenging where a large majority of students didn't finish the test. It covered content from the first 20 lectures of the subject (halfway through the content of Differential Calculus). Rather than overstressing about the test, try to understand each question after solutions are released to prepare yourself for the final exam.

Final Exam
The end of semester exam was out of 100 marks this year and was quite challenging. It was unlike past exams since the current lecturer Jan only recently took over for Professor Barry Hughes. Jan designed the exam so that half of the exam was doable however put much less emphasis on the easier topics such as differential equations. If you have completed most of the textbook questions and have gone over the assignment and MST questions, you should be in a very good position for the exam. There was no practice material provided or formula sheet but attempt past papers available online and check your answers with Jan in consultations. There always tends to be some slight upward scaling in this subject.

Overall Remarks

Again, this is a very challenging subject, and it is normal to feel overwhelmed. MAST10009 requires a huge time commitment, even more so if you are to score highly. Keeping up and being thorough in your study is the best way you can set yourself up to succeed. Be proactive in asking questions and attending consultations to consolidate your understanding of difficult topics. Create a study group with some fellow students so you can help each other with the more challenging content. Meeting the prerequisites for this subject should provide you with all the prior knowledge required. Overall, do your best. Looking back at this subject, you realise that this subject is a lot more achievable than you think at the time and it is honestly very rewarding. Good luck!

MAST10021 Calculus 2: Advanced [SM2]

Exemption status	Not an exemption subject, but it is a prerequisite for ACTL20001 *Introductory Financial Mathematics* (CM1 Actuarial Mathematics I)
Prerequisites	A study score of at least 36 in VCE Specialist Mathematics ¾ or equivalent OR Pass of MAST10022 (Linear Algebra: Advanced) OR Mark of ≥75% in MAST10007 (Linear Algebra) OR Mark of ≥80% in MAST10005 (Calculus 1) OR Mark of ≥75% in MAST10018 (Linear Algebra Extension Studies)
Lecturer(s)	Dr Volker Schlue
Weekly contact hours	3 × 1-hour lecture 1 × 1-hour tutorial
Assessments	6-8 Written Assignments 20% Final Exam 80%
Textbook Recommendation	Spivak, M, 1967, Calculus, 4th edn ✗ **Not recommended**. Helps with clarification of topics, follows a similar progression to the course, but is by no means a necessity
Lecture Capture	Full (both audio and video)
Year and Semester Reviewed	2023 Semester 2

Comments

Calculus 2: Advanced is a rigorous and proof-based introduction to first-year calculus. It covers all the same content as in *MAST10006 Calculus 2*, with some additional topics borrowed from *MAST20026 Real Analysis* to allow for a mathematically rigorous basis of calculus. This subject is taught quite differently to *MAST10009 Accelerated Mathematics 2* where the content of the two aforementioned subjects is raced through in one semester. Instead, all the key concepts are taught from the ground up in a level of depth and care that is aimed to invoke a deeper understanding and intuition for the topics but does however require a thorough engagement with the mathematics to grasp the concepts.

In general, it is a great option for students with mathematical talent who are interested in knowing more about the beauty of pure mathematics. I personally loved the teaching format and Volker is a nice and thorough lecturer, and the lecture capture is generally greatly handled. Given you are willing to put in the work, the subject is an amazing experience overall.

Subject Content

1. **Numbers, functions, and graphs**

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An emphasis on dealing with inequalities, introduction to proof-writing, and graphing representations of multi-variable functions. Not too bad, largely a rigorous extension of the functions section of VCE Methods.

2. **Limits and continuity**

   The construction of a limit using a formal definition (known as the epsilon-delta definition) is explored in great depth here, along with a definition of continuity using this construction. Can be weird the first time encountering this, a lot of practice questions at first is recommended to grasp these concepts.

3. **Differentiation**

   Review and proof of the basic derivative laws, and differentiation in higher dimensions. This is largely an extension of differentiation from VCE Methods and Specialist and is one of the easier topics.

4. **Mean Value Theorem**

   A deep dive into one of the most fundamental theorems in analysis. Conceptually may be challenging, and knowing where to use it in proofs can also be tricky, but as it is, there is not much to learn about it.

5. **Integration**

   Integration techniques with a focus on by parts and substitution. Should be straightforward with the background knowledge from VCE Specialist.

6. **Differential equations**

   Solutions and methods to solving differential equations are explored; linear and non-linear, first and second order, separable and non-separable. There are some tricky techniques in here such as variation of constants and proof of uniqueness and this topic probably took up the most study.

7. **Complex numbers and complex exponentials**

   This topic introduces complex numbers and uses them to describe rotation around the plane. This topic is not taught with as much rigour as the others as doing so would require *Complex Analysis*, a much more complicated area of maths, so not a lot of emphasis is placed on the topic.

8. **Taylor polynomials**

   A useful tool to approximate functions to polynomials, and the behaviour of these approximations.

Lectures

3, 1-hour weekly lectures are presented and recorded, going through all the covered topics with a good progression and flow. Additional lecture notes are also posted on the LMS to complement the lectures (which are not followed as lecture slides like other subjects) and include some practice problems for each topic. These practice problems are extremely useful study, and the lecture notes are good to look back on for clarification when attempting these problems.

Tutorials

The weekly 1-hour tutorials involve students working as small groups around whiteboards through problems similar in nature to that in lecture notes (often one or more of the problems will be directly from the notes). I had tutor Paul for my tutorials, and he was very good at explaining the concepts in a way that is valuably different to Volker's (hearing from a different perspective is often necessary). It is also generally a great way to engage in practice with other students.

Assessment

The assignments are due every week and a half and consist of around 4 very mentally intensive and time-consuming questions regarding topics talked about in lectures. These questions often must be left and come back to often to give enough room to come up with potential solutions, as they require ingenuity and generally

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quite a bit of trial and error to arrive at the intended solution. However, if you are an advanced student and are willing / able to put in the time to engage with these problems, it is quite worth it for the exam.

The exam in comparison to the assignments is much easier / straightforward, especially after gaining the mathematical insight that working through the assignments provokes. It involves around ten questions which are usually simple applications of rules learned throughout the semester, with a few difficult applications as higher-end questions. The first question is a bunch of 'True or False' questions, which if you are familiar with the ins-and-outs of the topics from the semester, should be free marks. If you have worked through the assignments and some of the lecture note problems from the topics that you find more difficult and clarified any gaps in your knowledge regarding these questions, you should have the tools to do well in the exam. The exam is similar in difficulty to the mid-semester quiz (which in my year was not assessed).

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Subject Reviews: Second-Year Subjects

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MGMT20001 Organisational Behaviour [SM1]

Exemption status	Not an exemption subject, but it is a prerequisite for the *Bachelor of Commerce*
Prerequisites	None
Lecturer(s)	Prof Bill Harley Prof Graham Sewell
Weekly contact hours	1 × 1-hour lecture 1 × 1-hour tutorial
Assessments	Tutorial participation and preparation 10% Individual Assignment 10% Case Study Report 30% Final Exam (hurdle) 50%
Textbook Recommendation	McShane, S. et al., 2019, Organisational Behaviour, 6th edn, McGraw-Hill Education ✓ Recommended. The textbook had to be directly referenced in both the individual assignment and individual report. The lecturer also encourages you to read the book to learn the concepts as they don't go teach it properly and in depth in the lectures.
Lecture Capture	Full (both audio and video)
Year and Semester Reviewed	2023 Semester 1

Subject Content

Subject content is mandatory and split into Micro, Meso and Macro.
There are 12 lectures in total each on a different module
Module 1: Introduction to OB
Micro topics
    Module 2: Contrasting Management Approaches
    Module 3: Perception, Attribution and Decision Making
    Module 4: Teams and Leadership
    Module 5: Values, Attitudes and Behaviours
    Module 6: Motivation
Meso topic
    Module 7: Conflict & Negotiation
Macro topics
    Module 8: Ethics
    Module 9: Organisational Change
    Module 10: Organisational Culture
    Module 11: Organisational Communication
    Module 12: Power and Influence

Lectures

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Lectures were held live on campus and recorded on Lecture Capture on the Friday of each week. The lecture content is not difficult, but the application of it is a shot in the dark. At least, the lecture slides were clearly structured and showed the important components that would be assessed.

However, a common recurring theme throughout each recording was the lecturer skipping through some of the slides, stating that we should read the textbook, and that the concepts are better explained in the readings - which they weren't wrong about as the lectures barely touched what was needed.

Tutorials

Tutorials were held once a week.

Only tutorials 3-12 were assessed with their pre-tutorial quiz worth 0.4% each and tutorial attendance worth 0.6% each, totalling up to a maximum of 10%. You should attend and do these all as the marks are guaranteed and consistent, unlike this subject and their expectations of you.

For the quizzes, if you put something that sounds right - which isn't all too difficult as the subject content you learn in the lectures is common sense - then you'll get the mark.

If you aren't a big fan of speaking in tutorials, then you're going to hate them. You're practically required to talk or sit there in awkward silence as 99.99% of the session is discussion with your tutor making obvious comments on the topic at hand. There is really no mention about what is expected of your assignment and there is no help in exploring the deeper aspects of what would have been genuinely interesting topics if taught right.

If you read the readings, then you will benefit more from the tutorials as you at least have a greater foundational base to discuss with your peers. In addition, pay attention to people in your class and try to decide on who you will do Assignment 2 with.

Organisational Behaviour is already difficult enough as is and having bad group members will make it unbearable.

Assessment

Individual Assignments and Group Case Study
Both assignments focused on micro and meso organisational topics from Week 1 to 7.

The first assignment was an individual essay worth 10% with a word limit of 1,000 words. It was due in the fourth week which gives you a decent amount of time given that you start early. The OB faculty were kind enough to host a study skill session on how to approach research and respond to the essay prompts. This was one of the most helpful things I learnt in the subject. The assignment overall is a good way to understand how you perform in the subject and what amount of effort you'll be expecting to put in to the second assignment.

The second assignment was a group case study report worth 30% with a word limit of 5,000 words. This assignment was released straight after the first assignment's due date and was due in week 9. You could form up to groups of 4-5. I highly recommend starting this assignment earlier and trying to choose reliable groupmates rather than leaving it to the last minute, as you will want to rip your hair out from stress and hatred for the subject. Just imagine assignment 1, but significantly more time intensive. Don't forget about planning, researching, writing and the multiple edits you'll want to go through. If possible, try and score above

80% on this assignment, so you have less of a burden relying on your end of semester exam to get you to your desired mark.

Final Exam

The end of semester exam is worth 50% of your overall grade. It is two hours and was held online via a canvas quiz in person at the REB. The exam consisted of four long response questions. Three of them are based on a single case study from the tutorials covering macro topics and the relevant case studies. In the final week, the lecturer will give you a table showing what macro topics and case study combinations will be assessed. This year it was Uber and Power. However, the first question was based on a micro-organisational topic which was the Dunning-Kruger effect this year. All the questions are equally weighted, so do not bias one question over another as you will bleed marks out and risk severely impacting your final grade.

For revision, look over the slides and the case studies. You aren't expected to reference, and it is more about the practical application of the theory you've learnt, which you will find to be somewhat confusing if you're aiming for a high mark due to the simple nature of the content and the word count you will need to fill in.

Try and not cram the entire unit within the last week before the exam - even though it is very doable - as you will lose your mind and go insane.

ACCT10002 Introductory Financial Accounting [SM1]

*Note that although this is a level 1 subject it is recommended for an undergraduate actuarial student to take this in their second year, using the normal progression of the Bachelor of Commerce majoring in Actuarial Studies

Exemption status	CB1 Business Finance, in conjunction with FNCE10002 *Principles of Finance*. Satisfactory performance across both subjects is required
Prerequisites	ACTL10001 Accounting Reports and Analysis
Lecturer(s)	Ms Demi Wang
Weekly contact hours	1 × 1.5-hour lecture 1 × 1.5-hour tutorial
Assessments	3 x Online Quiz 10% Written Assignment 5% Online Assignment 15% Final Exam 70%
Textbook Recommendation	Carlon, S, et al., 2022, Financial Accounting-Reporting, Analysis and Decision Making, 7th edn, Wiley ✗ **Not recommended**. Lectures were extremely extensive and provided enough detail to understanding the relevant concepts. Additionally, a lot of revision materials were also provided
Lecture Capture	Full (both audio and video)
Year and Semester Reviewed	2023 Semester 1

Subject Content

1. Financial Reporting, Conceptual Framework, sustainability, and ethics
2. Double Entry Recording
3. Accrual Accounting and Adjustments
4. Inventories and Accounting for GST
5. Receivables
6. Non-current Assets
7. Liabilities
8. Statement of changes in equity
9. Statement of cash flows
10. Annual reports, performance, debt vs equity
11. Remuneration Report

While for the most part the structure of IFA was that each week was focussed on a different part of financial reporting the introductory content covered in week 2 and 3 is extremely important in being able to complete the following weeks. As the topics covered in these weeks create the foundation of IFA and having a solid understanding of how to create T-accounts and recording journal entries is essential for the rest of the course. The official AASB definitions were also touched on throughout the lectures, and being able to recall these definitions was emphasised throughout the course as we were often asked questions regarding them. Each

week's topics were intense as the lectures went into extensive detail on the preparation of those specific journal entries as well as showcasing multiple scenarios that could occur in accounting and how they should be thought through.

Lectures

The weekly online lectures were uploaded to lecture capture every Monday. While the handbook does state they go for 1.5hrs each week the lecture duration varied. Demi's lectures were extremely comprehensive and went step-by-step through the process of preparing the relevant journal entries and thoroughly explaining the reasoning behind them. Additionally, she included numerous examples in her lecture slides to showcase the various situations that could show up in assessment as well as provide us with heaps of practice of the application.

With the large number of examples that Demi provides it gives you the opportunity to pause the lecture and try the questions out yourself before continuing, Demi encourages this throughout the course, and it personally helped me grasp the theory well.

Tutorials

The weekly 1.5hr tutorials provided the opportunity to go through some more practice questions from the previous week's lectures. The tutors would mostly just go through the answers straight away, so I would recommend attempting the questions prior to the class to get the most out of tutorials. Additionally, tutors would provide an in-class drop which involved a random question relating to the topic that we would attempt in class for extra practice. While they weren't compulsory to attend, I would highly recommend going each week as I found sometimes hearing the breakdown of journal entries from someone other than the lecturer was helpful to understanding the content. I don't know if it was just my tutor, but in most cases the class finished within an hour anyways.

Assessment

Online Quizzes

There are 3 online quizzes to complete that are spread out through the semester. Each only cover a few topics and are to be completed in 1 hour. Usually, the quizzes consisted of only a few questions, there was a mix between fill in the box type, calculation, and multiple-choice questions. I found the questions to be quite like the tutorial questions, maybe sometimes slightly more challenging, however nothing that I felt needed copious amounts of preparation for.

Written Assignment

The written assignment is quite short, around 500 words only. The assignment itself requires you to complete some calculations given the information and then answer a few short questions regarding the calculations. While I felt the assignment was quite straightforward and simple, it was hard to score well in. I would recommend following the rubric very closely, as the assignment instructions themselves are not very detailed.

Online (Xero) Assignment

This assignment was quite different from the others. Using the program Xero, we were required to practice accounting in real life situations, pretending to be the accountant for a fake business. The assignment was broken down into part 1 and part 2, with part 2 being weighted more heavily than part 1, which was merely an introduction course to Xero and a short quiz regarding the program's functions. Using Xero itself was not challenging, but interpreting the pieces of information given to which aspects of Xero should be used required

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more interpretation, so understanding each week's content and being able to visualise the relevant journal entries helped me complete this part. Part 2 also included a short quiz at the end, asking questions regarding what inputs you used to complete the assignment. This was a bit confusing at some parts, so I would recommend giving yourself at least a day before its due to go through the quiz slowly to make sure you've got every question.

Final Exam

The final exam was held in person and went for 3hrs with 15min reading time and consisted of 10 multiple choice and short answer questions. The biggest challenge with this exam is how long it is. The questions felt like an endless mix of preparing financial statements and journal entries and answering conceptual questions. The big questions that involved preparing financial statements were really time consuming and took a while to complete as in some cases you would have to be able to reconstruct T-accounts to find the correct values. The conceptual questions I felt were not as difficult as the lectures covered these topics extremely extensively, so being able to understand and remember the lectures well meant that the conceptual questions felt straightforward. Time management is something that you must be able to do well in the exam I felt like, as it is super easy to stay on one question for ages and have not enough time to complete everything else.

Overall Remarks

Introductory Financial Accounting (IFA) focusses on the preparation of financial statements from the perspective of the preparer as opposed to looking at accounting more generally in ARA. Each topic was focussed on a particular element of the financial statements and its details were discussed in great length. I never took accounting in high school, but many of my classmates have said that the content in IFA is pretty like high school accounting. While I personally found the class challenging due to the volume of content that was covered, overall, I felt once I understood the concepts well much of the material felt quite straight forward.

ACTL20001 Introductory Financial Mathematics [SM1]

Exemption status	CM1 Actuarial Mathematics I, in conjunction with ACTL30003 *Contingencies*. Satisfactory performance across both subjects is required
Prerequisites	**Students must meet one of the following prerequisite options:** • A total of 150 (out of 200) or more across MAST10006 or MAST10021 and MAST10007 or MAST10022; • A total of 120 (out of 200) or more across both MAST10008 and MAST10009 with a pass in each subject; • A total of 135 (out of 200) or more across MAST10007 or MAST10022 and MAST10009 with a pass in each subject; • A total of 135 (out of 200) or more across MAST10008 and MAST10006 or MAST10021 with a pass in each subject; • A total of 150 (out of 200) or more across both MAST10018 Linear Algebra Extension Studies and MAST10006 or MAST10021; • A total of 120 (out of 200) or more across both MAST10013 UMEP Mathematics for High Achieving Students and MAST10009 with a pass in each subject. [There is a more detailed summary of this on page 144 and 145]
Lecturer(s)	Dr Ping Chen
Weekly contact hours	2 × 1-hour lecture 1 × 1-hour tutorial
Assessments	2 x Individual Assignment 30% Final Exam 70%
Textbook Recommendation	None
Lecture Capture	Full (both audio and video)
Year and Semester Reviewed	2023 Semester 1

Comments

A disclaimer: I did ACTL10001 so take that into consideration when reading this review.

Subject Content

For those who did ACTL10001, Week 1-6 and Week 8 is revision.

Week 1: Introduction to data analysis; Principles of actuarial modelling

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A barebones overview of the actuarial profession. We look at the principles, rules, definitions and other miscellaneous information about data analysis and actuarial modelling. All conceptual. Nothing difficult. No calculations.

Week 2: Cashflow models; Simple and compound interest rate
This week looks at basic cash flows: how to account for the time value of money, and differences between simple and compound interest rates - also included is the discount rate. This also talks about consistent markets.

Week 3: Present value; Nominal interest rate.
This looks at discounting, accumulation, and nominal interest rates, i.e. interest rates that are not expressed in their relevant period, but instead annually. Make sure you remember nominal interest rates as it is easy to get confused if it is your first time seeing it.

Week 4: Varying interest rate; The force of interest
While you don't need to remember proofs, it is important you understand them as they give the conceptual background that helps ground theory. If you're unable to grasp the proof for the force of interest, you will struggle later relying on ROTE memorisation. Varying interest rates is also important and the relationships between all the rates is something you need to remember.

Week 5/6: Valuing cashflow: the notations for the annuity certain. Valuing cashflow: the techniques
These are the 2 most important weeks. If you fail to understand this, you're guaranteed to fail the end of semester exam. Understand all the formulas given, practice, practice and then memorise. This also includes those who did ACTL10001 as there are some new annuities (continuous) that were not introduced in ITAS. I can't stress enough how important it is you learn the techniques as they will save you time and a lot of pain later down the road if you learn them properly. This especially applies to the more niche techniques for cashflows that can't be expressed by the formulas learnt. You cannot ROTE learn in this subject and expect to do well - if you do, you're also setting yourself up for failure.

Week 7: Equations of value
This is basically PoF all over again but with more complex numbers and two techniques to estimate solutions - the bisection method and linear interpolation. Neither of them are difficult and they did not show up in the final exam. However, they did show up in Assignment 2.

Week 8: Loan contract
Home loans all over again. Guaranteed to have a very long question on the end of sem exam and will most likely appear in an assignment. Make sure you're very comfortable and confident with this.

Week 9: Project evaluation; Allowing for inflation
Project evaluation is just a practical application of equations of value. Allowing for inflation is just indexing.

Week 10: Asset classes; Pricing of bond product
Definitions of types of assets and how to prices different types of bonds using the present value of the cash flow payments.

Week 11: Understanding duration, convexity, and immunisation of cashflows.
Basically, how to protect your assets from liquidation via changes in interest rates.

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Week 12: The term structure of interest rate.
How to calculate interest rates from par rates, spot rates and other types of rates. In addition, talks about the relationship between interest rates and term.

Lectures

There were 2 lectures every week, but they were quite short relative to other subjects, going for about 50 minutes each. The content was paced fairly so you wouldn't feel incredibly overwhelmed. This paired with the fact that Dr. Ping is a great lecturer meant that you had a lot of time to process and apply the material learnt in the tutorial questions. The subject is very interesting and very intuitive with clear practical applications that help solidify and reinforce content you've learnt so you won't easily forget.

Tutorials

The tutorials were quite boring. I didn't go to them after the second week and just did the worksheets by myself. It is possible to learn from them with just the worked solutions and questions without a tutors help. If you did ACTL10001, then this will probably apply for you too.

Assessment

Assignments
There were 2 assignments, each weighted 15%. The first assignment is very easy and straightforward, as it was just a replica of ACTL10001. You just had to calculate accumulations for different scenarios. However, it's best if you learn some basic excel tricks and not brute force this as you will be stuck with a very boring task of formatting, writing equations and inputting data for hours compared to spending an hour or two learning how to use the basics of excel and taking ten minutes to do it.

The second assignment was trickier, but again was a replica of ACTL10001. You were put in scenarios regarding house loans and had to consider stamp duty, tax, and other costs along with the given information in the question to come to a requested answer. However, loan repayment schedules and home loans are arguably easy compared to the rest of the course and the real-life scenario is what posed some difficulty. I suggest you ask questions where you can on the question board and write down all your working out without discarding anything.

This is because the assignment had no set solution and was considered on a student-by-student basis, where the validity of their method was critiqued along with any assumptions made.
I also suggest you type up all your answers. It will save you a lot of time.

Final Exam
The end-of-semester exam was a 2-hour in person exam at REB. The questions were very similar to the tutorials and the singular given practice exam, so if you fully understand the concepts, tutorial questions and practice exam, the exam won't faze you. In addition, Dr. Ping gives you a checklist with tips for the exam which is extremely helpful. The biggest challenge of the exam is the timing as you will find yourself either unable to check your answers or unable to finish all the questions. Don't be stubborn and try and solve questions that you know you can't solve. Get all the marks you can and if you have any time then go back. Do as much as you can and worry about everything else after. You really don't have the time.

Overall Remarks

If you haven't done ACTL10001 Introduction to Actuarial Studies (ITAS), then ACTL20001 will be the first actuarial subject. This subject introduces you to a wide range of concepts required for the rest of the degree and gives some basic training on modern financial mathematics methods.

If you have taken ACTL10001, the first six weeks of this subject should just be revision and overall should be relatively easy as you have a whole semester of experience with the equations used (apart from the introduced ones). Don't forget that this and contingencies make up your CM1 exemption, so do your best to secure the score.

ACTL20003 Stochastic Techniques in Insurance [SM2]

Exemption status	Not an exemption subject, but it is a prerequisite for ACTL30001 *Actuarial Modelling I,* ACTL30002 *Actuarial Modelling II,* and ACTL30007 *Actuarial Modelling III* (CS2 Risk Modelling and Survival Analysis)
Prerequisites	ACTL20001 Introductory Financial Mathematics MAST20004 Probability
Lecturer(s)	A/Prof Han Li
Weekly contact hours	1 × 2-hour lecture 1 × 1-hour tutorial
Assessments	Assignment 1 15% Assignment 2 15% Final Exam 70%
Textbook Recommendation	None
Lecture Capture	Full (both audio and video)
Year and Semester Reviewed	2023 Semester 2

Subject Content

1. Three types of random variables and their characteristics]
   Revises Discrete and Continuous Distributions, moment generating function, probability generating functions and other basic concepts from probability. Moves on to examine truncated distributions. mixed random variables, and simulation of all three types of random variables. Then applies mixed random variables to the context of insurance, particularly for reinsurance. Examines expectations of the three types of random variables and expectations of functions. Also considers some inequalities of probability and expectation. An important module for later units.
2. Characteristics of sum of independent identically distributed (iid) random variables
   Familiar material as it revises using the MGF to find the distribution of a sum of IID random variables. Explores using direct convolution and recursive calculations to find distribution of a sum of IID random variables. Revises law of large numbers and central limit theorem.
3. Conditional Probabilities and Conditional Expectations
   Mostly revision and some expansion of basics of conditional probability and conditional expectations and variances, including Bayes Theorem. Expands to mixture distributions.
4. Conditional Probabilities and Conditional Expectations
   Revises generating functions, examines the difference equation and how to solve using generating functions. A short topic but can be tricky.
5. Ordinary Differential Equations (ODE) and Laplace Transform
   Revises the three types of first order ODE and second order ODEs with constant coefficients. Examines Laplace transform its use in solving ODE's.
6. Poisson Process
   Examines Poisson Processes: properties, definitions, and associated distributions. Applies Poisson Process to discounted aggregate claims process. Content overlaps with topics in actuarial studies (ACTL20004).
7. Brownian Motions and Geometric Brownian Motions

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Examine stochastic processes, moves to the properties of standard, arithmetic, and geometric Brownian motion.

8. Ito's Integral
Considers Reimann Integral, Riemann-Stieltjes Integral, Stochastic Integrals and Ito's Integral, including its properties and differences. Examines some basic calculations using Ito's integral.

Lectures

Lectures were two hours and covered plenty of content with detail so it's important to be thorough and have a strong set of notes made for reference. Annotating the lecture slides was sufficient for me but I preferred watching lecture recordings so I could pause and annotate the slides and take longer with topics that were denser. Han Li explained concepts well and I found it a better explanation for some of the overlapping/revised materials than the other courses. The lectures covered some important examples, and it is important to be able to complete these examples yourself as assignment and even exam questions were built from this foundation.

Tutorials

Tutorials are not recorded but attendance is not assessed. The sheets and answers and available on the LMS. Tutors would provide a summary of that week's content and then cover the solutions to that week's tutorial questions. The tutors explained concepts well and were open to questions. It is important to be clear on the concepts covered early in the semester so make sure to ask your tutors for help if needed. While the answers were provided, they were not as detailed and having tutor's solutions are more useful.

Assessment

Assignments

There were two assignments of the same format: a set of questions that could be completed either individually or as a group of up to 4 students (doesn't need to be same tutorial group). I would highly recommend completing the assignments as a group as they are quite long and can be tough to get through alone. The question were all extensions of what we had seen in class and were not unduly difficult of confusing. While sufficient time was given to complete the assignments, they would each cover half of the course contents so it can be difficult to complete if you do not stay up to date with course contents. The marking was fair, and students generally scored well for them.

Final Exam

The final exam was 2 hours long with 15 minutes of reading time and had a mixture of multiple-choice questions and long answer questions. You were permitted to bring 2 A4 double sided sheets which was a generous amount of space for notes.

The time was enough to complete the exam, but you would need a strong knowledge and move quickly to do so. Overall, it was moderately difficult, and the exam questions were extensions of familiar questions from assignments and tutorial sheets.

Han Li was generous in specifying important questions and concepts for each topic and providing the previous year's exam and spent a lecture going through the important questions and providing advice. Following this guide took the guesswork out of preparing and was very helpful.

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Overall Remarks

Overall, I found stochastics to be an interesting and well-structured subject, it did not feel like an overwhelming amount of content and the questions in assessments felt familiar yet challenging. The provided materials were sufficient to do well, there were also online revision quizzes for reach topic which were useful. It felt like I was proportionally rewarded for the time I invested, my marks felt justified, and the coursework felt manageable.

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ACTL20004 Topics in Actuarial Studies [SM2]

Exemption status	CM2 Financial Engineering and Loss Reserving, in conjunction with ACTL30006 Intermediate Financial Mathematics and ACCT40004 Advanced Financial Mathematics. Satisfactory performance across the three subjects is required
Prerequisites	ACTL20001 Introductory Financial Mathematics MAST20004 Probability
Lecturer(s)	Dr Benjamin Avanzi, Dr Yuyu Chen
Weekly contact hours	2 × 1-hour lecture 1 × 1 hour tutorial
Assessments	Mid-semester Exam – 15% (Covers Modules 1-5) Individual Excel-Based Assignment – 25% Final Exam 60% (hurdle)
Textbook Recommendation	No specific textbook, but assigned readings given with the resources provided.
Lecture Capture	Full (both audio and video)
Year and Semester Reviewed	2023 Semester 2

Subject Content

Topic 1: Utility, Risk, and Insurance
Covers the basic concepts of utility and why insurance as a business exists.

Topic 2: Basic Reserving Concepts
Introduces the idea of reserving, the reserving process and why we need to reserve.

Topic 3: Reserving Claim Counts
Introduces the three methods on reserving Incurred but Not Reported (IBNR) claims:
Exposure Based, Normalised, and Chain Ladder.

Topic 4: Reserving Claim Amounts
Introduces case estimates and claim estimates along the with methods to estimate.
them: Chain Ladder, Separation and PPCI
Topic 5: Reserving Combination
This has the smallest amount of content as it just discusses more of the nuanced.
points

Topic 6: Excel Topics
No pre-requisite knowledge needed for this. This is the second shortest module and is not assessable for the end of year exam. However, the tips and techniques used will be useful for the second assessment (individual assignment)

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Topic 7: Stochastic Interest
Covers basic stochastic models for investments, namely the fixed rate and variable.
rate interest models.

Topic 8: Ruin Theory
Introduces the basic idea of ruin for insurance businesses, notation, terminology and
calculations. Having a strong probability and algebraic manipulation foundation will
be very beneficial.

Lectures

The first 6 weeks were thought by Professor Benjamin Avanzi, and the final 6 weeks were taught by Professor Yuyu Chen. The lectures were highly engaging and necessary for the course. Concepts are taught well, and slides explain ideas in depth. The lecturers write on the slides and provide them after the session. I heavily suggest that you prepare before the lecture as the content can be overwhelming. Adequate preparation for lectures can include reading through the lecture slides, the published modules and doing the prescribed readings.

Tutorials

I didn't attend many of the tutorials, only showing up to 2. I didn't really find them necessary, but in hindsight I would've performed better if I attended. For the times I attended, they covered the tutorial questions solutions in class as you were expected to complete the problem sets beforehand. Much of the time is overlooking your own work and discussing with the tutor. Doing the tutorial problems themselves is extremely important though.

Assessment

Assessment 1: Mid-Semester Test

The Mid-Semester Test was difficult as we were required to do some extensive calculations under time pressure which allowed for easy arithmetic mistakes given the test covered topics 1-4. To prepare for this, perform a lot of tutorial questions without the use of a spreadsheet and get used to finding shortcuts in the calculations rather than relying on excel. Trying to perform the long calculations when a shorter method is available will detriment your score significantly. No practice test was given and the questions presented were like the tutorial sheet, except for being unable to use a spreadsheet to do the calculations.

Assessment 2: Reserving in Excel

Start this assignment ahead of time and do not leave it for the last minute. The assignment is composed of a submission of a spreadsheet, 5-minute video and 1000-word document explaining your methodology and the figure you arrived it. 5 minutes and 1000 words is barely enough and requires prioritising the important aspects of your report. The spreadsheet requires you to sort through 1000+ claims data and apply the reserving techniques you learnt in class. It is incredibly time-intensive due to having to mess around with excel and it is something you cannot get done in one night unless you want to risk a sub-50%. This was great in teaching the basics of reserving, the decision-making process behind the different reserving methods and the process in which insurance companies would determine their reserves. I found it insightful, fulfilling and a great application of the content learnt in class.

Assessment 3: Final Exam

From what I know, hardly anyone finished the final exam as there was a lot of content and not enough time. Specifically, the final two units took up an intense amount of calculation which occupied a great portion of the exam. Units 1-5 are hardly assessed, and Units 7-8 are the major focus making up at least 80% of the exam. The questions are like the tutorial sheets with a couple twists in them. To prepare, get good and fast at the calculations so you can spend more time attempting questions rather than checking and doubting if you've made the right step or not.

Overall Remarks

Topics in Actuarial Studies is a hard subject but incredibly rewarding that provides the basis for reserving techniques. Having strong mathematical foundations in probability and algebraic techniques is a must. I suggest staying on top of tutorial sheets and not falling behind as that was my biggest regret. Due to the content heavy nature of this subject, falling behind makes it incredibly difficult to catch up as each module builds upon the last. My biggest tip would be to persist and spend a consistent amount of time across the semester studying for this unit, as you'll be unable to understand concepts straight away.

This subject loosely builds off the knowledge of previous subjects including Probability MAST20004 and IFM ACTL20001 as well as the Poisson Process from ACTL20003 which runs at the same time. Overall, this subject introduced a variety of interesting and basic techniques which I enjoyed as it showed the more practical applications relevant to actuarial studies.

ECON20001 Intermediate Macroeconomics [SM2]

Exemption status	CB2 Business Economics, in conjunction with ECON10004 Introductory Microeconomics. Satisfactory performance across both subjects is required
Prerequisites	ECON10003 Introductory Macroeconomics
Lecturer(s)	Dr Yusuf Mercan Dr Faisal Sohail
Weekly contact hours	2 × 1-hour lecture 1 × 1-hour tutorial
Assessments	2 x Quizzes 10% (5% each) 2 x Assignments 25% (12.5% each) Final Exam 65%
Textbook Recommendation	Blanchard, O, 2021, Macroeconomics, 8th edn, Pearson ✗ **Not recommended**. The lecture slides provide enough depth of material to help you understand the course, and the subject heads provide you with supplementary reading material for the 'heavier' concepts.
Lecture Capture	Full (both audio and video)
Year and Semester Reviewed	2023 Semester 2

Comments

An alternative textbook for anyone who wants an alternative take on the course material is
N. Gregory Mankiw (2016). Macroeconomics. ninth edition.

Subject Content

1. IS/LM Model (Short-run macroeconomics)
    This topic gives students a chance to recap the contents from first-year economics. It takes the aggregate production function relationship with the consumption multiplier that all students learn in first year and adds some depth to it. It aims to express consumption and investment as functions of interest rates so that the set equilibrium outputs in the market for goods (and services) can be paired with financial markets. It particularly highlights the relationship between output and inflation by way of action taken by the government (fiscal) and reserve bank (monetary). This topic is extensively covered in the first multiple choice test.

2. Labour markets and unemployment
    This topic explores labour market dynamism and how economies tend toward steady state unemployment rates. It also introduces the concept of job matches, which demonstrates the interactions between jobseekers and employers in their bids to find and create jobs. This is taught through the Beveridge Curve model, the Job Creation Curve model, and the concept of labour market tightness.
    This topic is heavily tested in the first assignment, and the content can be somewhat confusing with all the different notations if you are not familiar with basic labour market concepts. Understanding of the models, their purpose and how to derive will be beneficial for the rest of the subject and the exam.

3. Dynamic AD/AS Model

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The Dynamic AD/AS model goes further than previous models of the macroeconomy in that it includes an array of variables beyond inflation and output. There is an extensive derivation process that originates from 5 key formulae. This topic is where it was found that the supplementary material provided by the lecturers was especially useful, because combining all the different building blocks of this model can be quite confusing. This topic, like in first-year economics, focuses on the impact of short-term shocks as well as long-run impacts on the economy's output and inflation rate.

4. Solow-Swan and Growth Models

An introduction of more models that map economic growth in the long run. This looks at the Cobb-Douglas model relating output, capital, labour, and productivity akin to the first-year model, however in this course these concepts are explored further with different models. You will start to notice that you must do more than memorise formulas as the questions require you to prove that you understand these models and how to apply them. Lots of exam and assignment questions are based around some novel adjustment or variation to the model, and you will need to know how to mathematically and intuitively explain how that adjustment would impact the macro-economic outcomes. Ensure you have set a good foundation in understanding these models from the previous topics.

5. Open Economy IS/LM Model

This is a return of the first topic, however with additional levels of complexity as it now caters for an open economy. This explores concepts of foreign capital flows, exchange rates and their relationship with domestic and foreign interest rates as well as an exploration on exchange rate regimes. Often the effects will be intuitive, however it is important to think about things logically and ensure your resultant net income shown by your model is consistent with that. In this topic, it is important to understand the differences between exogenous and endogenous variables.

6. Topics in macroeconomic policy

This is a one lecture miscellaneous topic introduced at the end of the semester. It is a simple model outlining the different outcomes of 'rule' vs 'discretion' in monetary policy decision making. You deal with a simple function and need to conceptually understand the different outcomes of that function.

Lectures

The semester's lectures are split in half whereby the first half of the semester is taught by Yusuf and the second half by Fasail. Each lecture involved the introduction of a new model or elaboration on ones previously covered. Both lecturers also complemented their teachings with empirical evidence and real-life examples, which is helpful for framing the content as the models could at times seem overly abstract and general. At the end of every section, there would also be a practice exam question related to the topic that they discussed. The lectures are not compulsory attendance, so it is possible for you to view their recordings online.

Tutorials

These ran in a typical way with economics subjects. We were given pre tutorial and in tutorial work to do. Types of questions included true/false, short answer and extended response. They were excellent for testing your understanding and making sure you are across the niches of the model. True/false prepared you well for the multiple-choice quizzes, whilst the extended responses were very helpful when it came to exams and assignments. The extended questions revolved around the introduced model, whilst introducing additional levels of complexity.

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Assessment

Quizzes

There were two quizzes in the form of multiple-choice questions. Administered over Canvas, these were particularly focused on the models introduced. Both gave you 30 minutes to do 15 questions. Whilst you need to understand the models, most of the questions can be done mentally. The second quiz was a bit more theoretical, so ensure to have lecture slides easily accessible.

Assignments

Both assignments could be chosen to be completed individually or as a group of your choice (max. 3 people per group) with a 1500-word limit. It is vital that you can find the right formulas to apply, make appropriate adjustments and elaborate in explanations to demonstrate your understanding. Explanations are not time consuming however there are several graphs that you must create in excel and include in your assignments. Ensure that you are relatively comfortable with entering in formulas on excel and having accurate cell referencing. Also, ensure that you can type-write in mathematics formulas on word, because the lecturers and tutors do not accept images of handwritten algebra in assignments.

Final Exam

Exam Structure:

- Section A: 12 Multiple-Choice Questions [20 marks]
- Section B: 3 Short Answer Calculation and Explanation Questions (Pick 2) [20 marks]
- Section C: 3 Short Answer Calculation and Explanation Questions (Pick 2)

Each question in Section B and C tests a particular topic in the subject, however, it is important to have a broad understanding across all the potential topics as there is no standard pattern of content covered across these sections. Completing past exam questions will be beneficial for the exam overall as the questions can be somewhat similar. Additionally, mid-semester quizzes are a good source to test your knowledge for Section A. Section B is generally like tutorial questions with process-driven calculations based on the standard models. In Section C, you must display your understanding of the models as they will give you certain adjustments that you have not been exposed to before.

Overall Remarks

Content-wise, like Introductory Macroeconomics, you spend time developing these seemingly strange models that attempt to explain economic activities. The main difference is that in this course, you begin to appreciate the effectiveness of these models a bit more and consider how particularly important variables were determined (endogenous vs exogenous). This course is also more conceptually challenging as you start to explore variations behind models and make more variables interdependent. Overall, ensure you understand the purpose of each model in terms of how they fit together and how to derive them as this will ensure you truly comprehend their purpose and are ready for any complications posed by exams and assignments.

MAST20004 Probability [SM1]

Exemption status	CS1 Actuarial Statistics I, in conjunction with MAST20005 *Statistics* and ACTL30004 *Actuarial Statistics*. Satisfactory performance across the three subjects is required
Prerequisites	One of MAST10006 Calculus 2 MAST10021 Calculus 2: Advanced MAST10009 Accelerated Mathematics 2 (Completed with a mark of at least 60)
Lecturer(s)	Prof Peter Taylor Prof Mark Holmes
Weekly contact hours	3 × 1-hour lecture 1 × 1-hour tutorial 1 x 1-hour computer lab
Assessments	4 x Individual Assignments 20% Final Exam 80%
Textbook Recommendation	Ghahramani, S, 2005, Fundamentals of Probability, with Stochastic Processes, 3rd edn, Pearson Education ✗ **Not recommended**. The lecturers teach the content with enough depth and provide adequate questions in the problem booklet. There are also a full set of lecture notes available at the start of the semester which allows students to work ahead in the content.
Lecture Capture	Full (both audio and video)
Year and Semester Reviewed	2022 Semester 1

Subject Content

1. Basics
    This topic talks about real life applications of probability, axioms, conditional probability, multiplication theorem, independence and exclusion, law of total probability and Bayes' formula.
2. Random Variables
    This topic introduces the concept of random variables, both discrete and continuous, and distribution functions and probability density functions. Next is the concept of expectation and variance, and higher moments of a random
    variable.
3. Special Probability Distributions
    This topic introduces the many special probability distributions for both discrete (Bernoulli, binomial, geometric, Poisson) and continuous (exponential, gamma, beta, pareto). We go through each distribution, calculating their distribution function, probability density function or probability mass function (where they exist), expectation and variance. This topic also focuses on the normal distribution, explaining about the process of standardization into the standard normal distribution, moments, and the many approximations that the normal distribution can be used for.
4. Transformations

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This topic focuses on the transformations of random variables, including monotonic functions, square functions, and pseudorandom numbers. This also goes on to introduce more distributions, such as the Cauchy distribution and the lognormal distribution.

5. Bivariate Random Variables

This topic introduces the concept of bivariate random variables, which is a function which maps from the sample space into the real plane. We go through the distribution function of a bivariate random variable, joint and marginal pmf, pdf or df, conditional pmf, pdf or df, independence of these random variables, expectations, convolution integrals, variance, covariance, correlation and conditional expectation and variance. This also continues to the concept of Chebyshev's inequality.

6. Generating Functions and Applications

This topic dives into probability generating functions, moment generating functions, cumulant generating functions, coefficient of skewness and kurtosis, Laplace transforms, characteristic function. This is a useful concept to

understand and is most certainly going to be a heavy-marked question in the final exam.

7. Bivariate Random Variables

This topic explains the concept of convergence in distribution, law of large numbers, central limit theorem.

8. Bivariate Random Variables

This topic talks about stochastic processes, and more importantly, discrete-time Markov Chains where probabilities only depend on the value of the previous random variable. This also goes through transition matrix, equilibrium distribution (can be seen as limiting, stationary or ergodic).

Lectures

There were 3 lectures every week, normally around 50 minutes each. The content was quite fast-paced, and you should ensure you have time to digest the information and prepare yourself for the tutorials in the following week. Both lecturers had in-person lectures, where they welcomed any questions afterwards so if you have difficulty following the content, be sure to meet them in-person so you can directly ask your doubts.

Tutorials

The tutorials explored many calculation questions that are very helpful in allowing you to try a variety of calculation questions to ensure you have understood the content well. The exam questions are quite like the tutorials, so if you have any doubts, don't hesitate to ask your tutors.

Assessment

Assignments

There were 4 assignments and each weighted 5%. The assignments vary in difficulties but try to do as well as you can. If you are unable to do some of the questions, don't forget to ask your tutors/lecturers about them after they have been marked and the answers have been released.

Final Exam

The end-of-semester exam was a 3-hour Zoom-supervised examination. The questions were quite like the past exams, so if you fully understand the concepts, tutorials and have done sufficient past exam questions, you should not find it too difficult. However, the timing imposed the biggest challenge since it requires you to finish a lot of questions in only 3 hours. I would recommend taking your chances and do as much as you can, and only recheck your answers if you have extra time.

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Overall Remarks

MAST20004 explores the many concepts of probability. This subject is quite content-heavy, and it's best to stay on track with the lectures or else you might find it difficult to catch up. If you have never taken a probability course before, don't be shy to attend consultations if you have any questions during the course. Overall, this was quite intimidating for a lot of the students, but if you stay on top of your lectures, attend your tutorials, and review a lot of past papers, you will be fine.

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MAST20005 Statistics [SM2]

Exemption status	CS1 Actuarial Statistics I, in conjunction with MAST20004 Probability and ACTL30004 Actuarial Statistics. Satisfactory performance across the three subjects is required
Prerequisites	MAST20004 Probability
Lecturer(s)	Dr Robert Maillardet Dr Dennis Leung
Weekly contact hours	3 × 1-hour lecture 1 × 1-hour tutorial 1 x 1-hour lab tutorial
Assessments	3 x Individual Assignments 20%, equally weighted Lab (R) Test 10% Final Exam 70%
Textbook Recommendation	None
Lecture Capture	Full (both audio and video)
Year and Semester Reviewed	2023 Semester 2

Subject Content

MAST20005 is a natural progression from MAST20004, and uses the techniques taught in the latter to introduce the basic elements of estimation, statistical modelling, and data analysis.

1. Introduction and Review of Probability
   This module provided an overview of the subject and the intuition behind statistical techniques. It was also a brief overview of the relevant topics from MAST20004.
2. Point Estimation
   This module introduced estimation (here for a single number or parameter) and the methods to construct point estimators. It embeds the fundamental distinction between parameters and their estimators and explains different ways we can estimate those parameters with the sample data. Keep an eye out for the maximum likelihood estimator since it is important for the subject.
3. Asymptotics & Optimality
   This was probably one of the more conceptually challenging components of the course, especially with the derivation of the Rao-Cramer lower bound, however the applications were rather simplistic. These theories focus heavily on the maximum likelihood estimator's properties of asymptotic optimality.
4. Interval Estimation
   This material was the closest to the statistics covered in Mathematical Methods and extends those confidence intervals for other cases and distributions. This was probably the most simplistic topic and relied on repetitive, plug and play calculations.
5. Hypothesis Testing
   This topic extended the different cases from the previous module to perform tests on different hypotheses for the parameter in question.
6. Regression
   Despite being a rather simple concept, this semester focused largely on the derivation of parameters for regression rather than performing regression on data sets itself. If the parameters seem overwhelming, focus on the few tutorial questions that require analysis of given data to build intuition that way.
7. Analysis of Variance (ANOVA)

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ANOVA followed on quite naturally from regression, and again there was a focus on theory over data analysis. My tip would be to start with understanding what ANOVA is testing, which is whether the means of two or more populations are the same. This can be confusing because ANOVA has the word "variance" in its name.

8. Distribution-Free Methods

This topic was a bit of a left turn from the rest of the course since it used very few assumptions about the distribution of the data. The number of different tests here can be really overwhelming, and here the tutorial is very important because there is information (especially about performing these tests by hand) in there that was skimmed over in the lecture. Make sure to be aware of Pearson's chi-square test as it is the most assessable of these methods to crop up on the exam.

9. Bayesian Methods

In this module we used Bayes theorem from MAST20004 to quantify uncertainty about events both before (prior) and after (posterior) data is gathered. This was one of my favourite topics in the subject because the reasoning was more intuitive rather than some of the more repetitive tests.

10. Other Aspects of Testing

The final topic for the subject was kind of an amalgamation of extension concepts from later studies in statistics. The lecturers briefly explained the Likelihood ratio test and the Neyman-Pearson lemma. No content from this module was assessed on the final exam.

Lectures

Lecture ran thrice weekly, with a morning and afternoon stream and each week covered one module's worth of content. I attended every single one of Dennis's lectures however this was because I happened to be on campus at the time. The lectures did assist my learning, mostly because I was exposed to the content early on, however Dennis was not the most engaging lecturer and in retrospect I would recommend attending Robert's lectures instead.

Tutorials

This subject was designed such that tutorials were the main source of learning. Each tutorial consisted of a one-hour tutorial with 10-12 questions, not intended to all be completed in the tutorial and to be finished at home in lieu of a problem booklet. The tutorial was followed by a one-hour lab, completed on an electronic whiteboard, using R software.

Assessment

Assignments

There were three individual assignments in this subject, spread throughout the semester. Whilst each assignment had some accessible questions, especially on the earlier assignments and the questions that involved R, there was wide consensus that the assignments were of an unreasonable difficulty and focused too much on proving theoretical results, rather than enforcing the statistical tests and techniques that were the bread and butter of the subject. That being said, "proofy" assignment questions were structured in multiple parts that guided you towards proving the result, the marking was incredibly lenient, and the assignments were doable if not left to the last minute. The assignments were significantly more difficult than the final exam.

Lab Test

As someone who had no prior coding experience, going into this subject the R test was rather daunting. However, the test was open book, completed at home on canvas, like the practice test and very leniently

marked. The time pressure was the only real issue. The lab test was a very accessible 10% of the subject, so I would highly recommend familiarising yourself with the R software during the labs throughout the semester.

Final Exam

The final exam was three hours, completed in person with a double-sided set of permitted notes and a calculator allowed into the examination building. It was significantly more difficult than past exams, especially due to its length, the lecturer himself not anticipating that students would complete the exam. That being said, apart from a few tricky questions, the majority of questions were very similar to the tutorials and accessible to students who had engaged with the tutorials either throughout the semester or during a SWOTVAC cram. For revision I would highly recommend focusing on understanding the tutorials and doing those questions, rather than cramming past exams, because the past exams were quite different from the actual exam. Before the exam the cohort was made aware that the exam would be longer than usual and both lecturers heavily implied that there would be a large degree of scaling. Anecdotally I can attest that the exam must have been scaled due to the mark I received and the number of marks that I skipped.

Overall Remarks

Overall MAST20005 was not a particularly difficult subject, especially relative to its prerequisite MAST20004. Despite the difficulty of the assignments and the final exam, the marking was lenient and scaling fair. The main trick to score high in this subject would be to engage with the material from the very start of the semester. I attended all my lectures (even though I may not have paid full attention), completed all of the tutorial sets before my weekly tutorial (even though I intermittently looked at the answers). I found it helpful to be aware of all of the material early on, even if I didn't fully understand it at the time, such that during SWOTVAC it all really came together and on reflection I realised that the material wasn't as complicated as it originally seemed. However, I mostly regret over-relying on past exams as preparation for the exams when the tutorials were a much more accurate gauge of the types of questions assessed on the final exam.

MAST20026 Real Analysis [SM1]

Exemption status	Not an exemption subject, but it is a valid prerequisite for ACTL20001 *Introductory Financial Mathematics* (CM1 Actuarial Mathematics I)
Prerequisites	One of MAST10006 Calculus 2 MAST10021 Calculus 2: Advanced MAST10009 Accelerated Mathematics 2 (Completed with a mark of at least 60)
Lecturer(s)	Dr Christopher Duffy
Weekly contact hours	3 × 1-hour lecture 2 × 1-hour tutorial
Assessments	5 x Individual Assignments 20% Final Exam 80%
Textbook Recommendation	None
Lecture Capture	Full (both audio and video)
Year and Semester Reviewed	2021 Semester 2

Subject Content

1. Mathematical Proof and Logic
   Introduction to the concepts of truth tables and proof logic (e.g. direct proof, proof by contradiction, etc.)
2. Set Theory
   Focus on constructing the real and rational numbers from sets
3. Real Numbers
   Different properties of real numbers using the real number axioms
4. Functions and Sequences
   Introduces techniques regarding sequence convergence and divergence
5. Limits and Continuity
   Focuses on proving limits of functions and introduces formal definition of limits and continuity
6. Differentiability and Integrability
   Introduces formal definitions of differentiable and integrable
7. Fourier Series

Lectures

Chris is a fantastic lecturer. I thoroughly enjoyed his methodical nature of teaching and looked forward to reading the supplementary notes. The lectures were in an unusual format, where the three lectures were pre-recorded and posted on the LMS on Monday of each teaching week. The total lecture time was well below the stated 3 hours, likely closer to an hour a week. However, the videos were only used as an introduction to the concept rather than a thorough deep dive, so reading the supplementary notes is a must. The examples that appear in tutorials, assignments and exams are based on the material in the notes. I found this method of teaching to be very effective, especially when online learning made watching lectures very monotonous and boring especially with my shortened attention span.

The supplementary notes also had a very short "testing your understanding" section at the end of each subtopic, where there were some basic questions which should be attempted. Additionally, there are problem sheets for each section with more difficult, exam and assignment style questions which can be used as revision

Tutorials

There are two tutorials a week for this subject, both which should be attended. Like other mathematics tutorials, there is a strong focus on group problem solving using Miro and Zoom. I found attending the tutorial to be a useful introduction to the level of understanding that was expected of the concepts. The tutorial questions have more of a focus on investigating different applications of the concepts rather than straight proofs, which was slightly different to the problem sheet and the exam, however being able to manipulate the concepts developed my understanding.

The tutors also were very useful in properly explaining the answers after giving the questions a go. The answers given on the LMS after the tutorials were quite limited, so I strongly encourage going to tutorials. I found the time spent thinking about the concepts to be invaluable in my understanding, especially for a concept heavy subject like this one

Assessment

Assignments
The assignments for this subject were slightly different to typical maths assignments. All assignments had a short reading at the beginning and required a short (less than 250 word) response on what you found interesting or peculiar about the reading. The readings were on concepts which I would not otherwise have considered and not directly related to the topics. For example, one reading was about how computers are being used to come up with conjectures and then proving them without human input. This would only make up a small proportion of the marks of the assignment.

Many of the marks are allocated to typical maths assignment style questions. A lot of the assignment questions were like the tutorials in that they were investigative in nature. Each part tended to build on the previous part to reach a conclusion. The difficulty is like the tutorials and the questions are usually quite obscure so stack exchange and google are not that useful.

There is also an optional (non-marked) section of the assignment which encourages you to learn how to typeset with LaTeX. This is a useful skill to develop if you want your assignments to look more professional.

Final Exam
The final exam was notable in that it covered most of the areas that were taught in some depth. All the definitions and theorems that were in the notes were also provided, which means that the notes sheet that you were allowed to bring could contain proof structures and concepts which you had difficulty with rather than straight definitions. The exam difficulty was like the tutorials and assignments with questions more similar to the problem sheets. The practice exam was very similar to the actual exam in terms of difficulty and the type of question.

Overall Remarks

Real Analysis is a second-year pre-requisite to many third-year maths subjects. The aim of this subject is to dig deeper into previous knowledge, especially from calculus 2 to question the fundamentals of maths. The course is built from the ground
up, with prerequisite content mentioned but not explicitly built upon. I found the content to be fascinating as its deep dives into the concepts you already know, such as limits and continuity and proves them to you from the fundamentals of maths. Chris is also an incredible lecturer, explaining all the concepts concisely. Also, his notes are thorough and extensive

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Subject Reviews: Third-Year Subjects

ACTL30001 Actuarial Modelling I [SM1]

Exemption status	CS2 Risk Modelling and Survival Analysis, in conjunction with ACTL30002 *Actuarial Modelling II* and ACTL30007 *Actuarial Modelling III.* Satisfactory performance across the three subjects is required
Prerequisites	ACTL20003 Stochastic Techniques in Insurance MAST20005 Statistics
Lecturer(s)	Prof Shuanming Li
Weekly contact hours	2 × 1-hour lecture 1 × 1 hour tutorial
Assessments	Individual assignment 1 × 15% = 15% Individual assignment 1 × 15% = 15% 2-hour end-of-semester exam (hurdle) 70%
Textbook Recommendation	None
Lecture Capture	Full (both audio and video)
Year and Semester Reviewed	2023 Semester 1

Subject Content

The main focuses of the subject are on survival models / distributions and the Markov process, which took up more than half of the entire teaching semester. The subject content builds on from a variety of past subjects, most notably Stochastic Techniques ACTL20003. A lot of proofs and formulae were taught in this subject, which can prove to be quite confusing at times. Therefore, knowing where and how to use these is a crucial key to succeed.

This subject offers a comprehensive foundation in mathematical and statistical modelling techniques pertinent to actuarial science. It focuses specifically on life insurance modelling, providing an in-depth understanding of survival models, lifetime distribution estimation, multiple state models, and Markov chains applications in actuarial contexts.

Key Topics:
1. **Survival Models**: Understanding the basics and applications of survival models in actuarial science.
2. **Lifetime Distribution Estimation**: Techniques to estimate lifetime distributions, crucial for actuarial predictions.
3. **Multiple State Models**: Construction and analysis of models that depict transitions between various states, essential for understanding life insurance dynamics.
4. **Discrete-Time Markov Chains**: Analysis and interpretation of these chains, with a focus on their actuarial applications.
5. **Continuous-Time Markov Processes**: Application of these processes in solving actuarial problems, highlighting their relevance in real-time data analysis.
6. **Transfer Models**: Creating models for transfers between states, involving both single and multiple decrements, and understanding the associated probabilities and transition intensities.
7. **Binomial Model of Mortality**: Analysing this model, deriving the likelihood estimator for

mortality probability, and comparing it with multiple state models.

8. **Transition Intensities Estimation**: Deriving maximum likelihood estimators for transition intensities in state transfer models with piecewise constant intensities.

Lectures

The first few lectures were nicely paced, but gradually got a lot more difficult a few weeks into the semester. Since all the lecture concepts interrelate and build from each other, it is important to fully understand the previous week's lecture content before moving onto new ones - this is especially important in the later units focusing on Markov Chains. Getting a good understanding of the proof and derivations are essential, especially when it comes to answering tutorial and assignment question. For the second half of the teaching semester, there were also quite a lot of additional notes, which were not shown in the lectures but posted on LMS. It is helpful to look through them in your own time to help solidify your understanding, but it is not essential to pass.

Tutorials

My tutor was very generous and provided weekly summary notes on the lecture content and included all the essential formulae, which later proved to be very helpful during exam revision. I would recommend attempting the tutorial questions prior to the tutorials (or at least look at the worksheet) as some of the questions are lengthy and quite difficult to follow along if you do not have prior exposure to them.

Assessment

Assignments

There were 2 equally weighted individual assignments, which have a mixture of calculations, proofs, and Excel questions. The first assignment focuses on the first 2 units, whereas the second assignment had questions on the remaining 3 units. Some of the proofs required in the assignments are like the examples from the lecture slides, just with some slight variations.

End of Semester Exam

This year's exam was a closed book exam with a 2-hour writing time and 15-minute reading time. The exam consisted of a mixture of True/False, Multiple Choice and Short/Long Answer questions and covered all the lecture content, with the focus being on Markov Chains. Given the significant number of formulae involved in the subject, a valuable tip is to keep your cheat sheet well-organised. This way, you can quickly find the necessary formulae even under stressful conditions.

ACTL30002 Actuarial Modelling II [SM1]

Exemption status	CS2 Risk Modelling and Survival Analysis, in conjunction with ACTL30001 *Actuarial Modelling I* and ACTL30007 *Actuarial Modelling III.* Satisfactory performance across the three subjects is required
Prerequisites	ACTL20003 Stochastic Techniques in Insurance MAST20005 Statistics
Lecturer(s)	A/Prof Rui Zhou
Weekly contact hours	2 × 1-hour lecture 1 × 1 hour tutorial
Assessments	Individual assignment 1 × 15% = 15% Individual assignment 1 × 15% = 15% 2-hour end-of-semester exam (hurdle) 70%
Textbook Recommendation	None
Lecture Capture	Full (both audio and video)
Year and Semester Reviewed	2023 Semester 1

Comments

The aim of this subject is to provide a foundation in mathematical and statistical modelling techniques that are of relevant in actuarial studies. The techniques studied include methods of estimating mortality rates and assessing their adherence to data and smoothness, as well as techniques for mortality projections. In addition, elementary principles of machine learning with applications to mortality modelling are covered.

Based on the assignments and the end-of-semester exam, I found this subject a lot more manageable as compared to the other two CS2 exemption subjects, Actuarial Modelling I and Actuarial Modelling III.

Subject Content

This subject mainly focuses on estimating mortality rates, evaluating their adherence with data and smoothness, and projecting future rates. You will also briefly learn about machine learning and their practical applications. In a way, the four modules are all linked together, so it is important to understand the overall objectives of each module to do well.

This subject delves into advanced mathematical and statistical modelling techniques vital for actuarial practice. It focuses on mortality rate estimation, adherence assessment, mortality projections, and incorporates elementary principles of machine learning for mortality modelling.

Key Topics:

1. **Mortality Rate Estimation**: Methods to estimate mortality rates, an essential aspect of actuarial work.
2. **Data Adherence and Smoothness Assessment**: Techniques to assess the adherence of mortality rates to data and their smoothness.
3. **Mortality Projections**: Understanding and applying various models for forecasting mortality rates.
4. **Machine Learning in Mortality Modelling**: Introduction to elementary principles of machine learning and their application in mortality modelling.
5. **Transition Intensities Estimation**: Demonstrating how to estimate transition intensities

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depending on age, using exact methods or the census approximation.
6. **Consistency Testing and Graduation**: Testing crude estimates against standard tables or graduated estimates and understanding the graduation process.
7. **Forecasting Approaches**: Outlining and applying methods like the Lee-Carter, age-period-cohort, and p-spline regression models using computer software.

Some general skills that I developed when completing this subject:
- Applying the principles of actuarial modelling effectively.
- Estimating and demonstrating transition intensities based on age.
- Testing and ensuring the consistency of mortality rate estimates.
- Employing various approaches to forecast mortality rates, including modern regression models.
- Understanding and applying basic machine learning principles in actuarial contexts.
- Utilizing advanced mathematical and statistical techniques to solve relevant problems.

Lectures

While the first few lectures on "counting birthdays" were quite straightforward, it got a lot more difficult after a while, so it is important to fully understand the lecture / tutorial content to keep up in later lectures. The proofs in the lectures are just there for you to understand where the equations come from and were not examinable this year. If you know how to apply the formulae properly you will get high marks.

The first few lectures were nicely paced, but gradually got a lot more difficult a few weeks into the semester. Since all the lecture concepts interrelate and build from each other, it is important to fully understand the previous week's lecture content before moving onto new ones. A lot of worked examples were provided within the lecture slides, which also helps us to solidify our understanding of the concepts.

Tutorials

Some of the tutorial questions are very similar to the assignment questions, so knowing how to do the tutorial questions well - either from tutor or from the answer sheet - will help a lot. To this end, attendance in tutorials is quite important as it can help make assignment completion a lot more guided and achievable than if you did not attend tutorials.

Assessment

Assignments

There were 2 equally weighted individual assignments on Excel. The questions were an extension to lecture contents and tutorial questions. The focus of the first assignment was on Unit 1 and 2 and the second assignment mainly focused on the Lee Carter Method. Since the lectures and tutorials showcased similar Excel spreadsheets, the assignments were quite straightforward and could be completed within a short amount of time if you know what to look for.

End of Semester Exam

It is a 2 hour in-person exam with 15 minutes reading time. You are allowed to bring 2 double-sided A4 paper printed or handwritten as notes. This year's exam (2023) was quite similar in style with last year's exam so with proper preparations it can be done well. However, the exam questions were quite lengthy considering the amount of calculation required, so allocate your time efficiently according to the marks for each question.

ACTL30007 Actuarial Modelling III [SM1]

Exemption status	CS2 Risk Modelling and Survival Analysis, in conjunction with ACTL30001 *Actuarial Modelling I* and ACTL30002 *Actuarial Modelling II.* Satisfactory performance across the three subjects is required
Prerequisites	ACTL20003 Stochastic Techniques in Insurance MAST20005 Statistics
Lecturer(s)	Prof Benjamin Avanzi
Weekly contact hours	1 × 2-hour lecture 1 × 1 hour tutorial
Assessments	Individual assignment 1 × 25% = 25% Mid-semester test = 15% 3-hour end-of-semester exam (hurdle) 60%
Textbook Recommendation	Prescribed textbooks are: • Wuthrich, Mario V., Non-Life Insurance: Mathematics & Statistics (January 7, 2020). Available at SSRN: https://ssrn.com/abstract=2319328 • Shumway, Robert H., Stoffer, David S. (2017) Time Series Analysis and Its Applications With R Examples, Springer, ISBN 978-3-319-52452-8
Lecture Capture	Full (both audio and video)
Year and Semester Reviewed	2022 Semester 1

Comments

Actuarial Modelling III is a very practical subject grounded in coding in R and provides an interesting insight into modelling techniques in General Insurance. It builds on some basic R learnt in MAST20005 Statistics and sometimes series models briefly covered in ACTL20004 Topics in Actuarial Studies. The subject was broken up into two main components, risk modelling and time series. Overall, I found this subject to be quite interesting despite it being quite content heavy.

Subject Content

Actuarial Modelling III is a very practical subject grounded in coding in R and provides an interesting insight into modelling techniques in General Insurance. It builds on some basic R learnt in MAST20005 Statistics and sometimes series models briefly covered in ACTL20004 Topics in Actuarial Studies. The subject was broken up into two main components, risk modelling and time series. Overall, I found this subject to be quite interesting despite it being quite content heavy.

Subject content
Module 2: Collective Risk Modelling
- Modelling claims with a deterministic vs random number of losses (Individual vs Collective Risk Modelling). Compound Distributions such as the compound Poisson.

Module 3: Claim Size Modelling
- Fitting a loss model to data with practical examples. It dives into intricacies that are commonly found in insurance data, where observations are incomplete, truncated or censored.

Module 7: Characteristic of Time Series
- This module defines from the bottom up what is a time series, how to describe the characteristics of time series and the importance of stationarity with relation to white noise.

Module 8: Time Series Regression and Exploratory Data Analysis
- How to detrend a time series to become stationary through processes such as regression and differencing. It also touches on how to smooth in time series.

Module 9:
- The main models of such as AR and MA which is covered in ACTL20004 Topics in Actuarial Studies; however, it builds heavily onto these.

Module 10:
- How to identify the underlying models within time series to be able to forecast future patterns.

Module 5: EVT
- How to model claims where there is a heavy right-tail, that is high chance of large loss, which often happens in insurance.

Module 6: Copulas

Lectures

Benjamin goes through the lectures module by module and separates them by each subtopic. This year lectures were back-to-back in person with a short break in between. The lectures are quite fast paced covering numerous slides; however, Benjamin often tries to provide many examples and a more practical approach when teaching difficult areas of this subject. Lecture recordings were also available and great for revision later in the semester.

Tutorials

Unlike your other actuarial tutorials, the questions for ACTL30007 are not provided in a weekly manner, but rather on a module basis. This structure confused many students at the beginning of the semester, but we, as all do, adapt. What surprised many of the students was the sheer amount of the questions included in a single week's tutorial. Tutors hence could not always go through the entire set of questions and instead selected a few questions to cover based on difficulty, importance, and the students' needs. As if structured to compensate for the lack of time spent in tutorials covering the questions, the provided solutions were more detailed compared to other subjects. It also included full scripts of R codes for questions which required its usage.

Assessment

Mid semester test
The mid-semester exam will be a quiz on Canvas with multiple choice questions (single or multiple correct answers) and open questions, some of which will require some R calculations using individual data sets. You must hence have a computer that can run R for the examinations.
The mid-semester exam will assess contents from Modules 2 and 3 (lectures of weeks 1-3) and associated tutorial exercises, readings, R codes, and course contents. This focuses on the claims modelling component of the subject.

Assignment
This assignment is unique in that there is much freedom in topic choice and assesses communication skills through a video presentation. A five-minute oral presentation with slides had to be recorded and submitted.

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The presentation was about analysing a time series of your choice. A mistake that many students made (including myself) was focusing too much on trying to find the "perfect fit" and describing every single analysis that took place. Should I have the chance to re-attempt the assignment, I would first give myself plenty of time to plan out the "presentation" aspect of the assignment, and take a rather holistic approach, honestly stating any limitations of my analysis as I would in a real interview.

End of semester exam

Although some exams reverted to 2-hour exams, this exam was still an online 2-in-3-hour canvas exam*, with a similar format to the mid-semester exam. Many of these questions had extensive use of R.. Benjamin also provided a detailed break-down of the mark distribution for the exam, which was quite helpful for allocating limited revision time across the different units. The datasets were released earlier than the exam time so they could be imported into R earlier without any troubles.

*The "2-in-3 hour" exam format means that the examination is the equivalent of a 2-hour assessment; however, students are provided with 3-hours to accommodate the time that will be required for typesetting of mathematical expressions and the uploading of documents.

ACTL30008 Actuarial Analytics and Data I [SM1]

Exemption status	None, but is a prerequisite to ACTL40012 Actuarial Analytics and Data II (Honours exemption subject for DSP: Data Science Principles)
Prerequisites	MAST20005 Statistics
Lecturer(s)	A/Prof Xueyuan (Shane) Wu
Weekly contact hours	2 × 1-hour lecture 1 × 1 hour computer lab
Assessments	Individual Computer-Based assignment 2 × 15% = 30% 2-hour end-of-semester exam (hurdle) 70%
Textbook Recommendation	An Introduction to Statistical Learning with Applications in R, by Gareth James et al. (Springer Science + Business Media New York 2013) This textbook is essential as the subject is heavily based on the textbook and the resources provided on the textbook website. It is ✓ **highly recommended** to have a preview of this book before taking the course as you will get a clear and comprehensive overview of the subject.
Lecture Capture	Full (both audio and video)
Year and Semester Reviewed	2023 Semester 1

Comments

This subject introduces the basic statistical learning methods as well as their applications in R. It is not an exemption subject, but it forms a solid foundation for the exemption subject ACTL40012.

In terms of difficulty, it is on the easier side compared with AM1, AM2 and AM3. However, to truly understand and be comfortable with the subject I feel like it was essential to be willing to spend time with R and "get dirty with the data". In general, I found that even though this subject is heavily based in R most of the codes we required to complete our assignments and exams were presented directly to us and given in tutorials.

Shane mentioned at the start of the course that "there are often no correct answers, only wrong answers". This should give a glimpse into the type of subject this is, as there are often multiple ways of tackling a problem. Therefore, the key to this subject is to understand what you are doing and being able to justify your actions.

Subject Content

1. **Overview of Statistical Learning**:
   - This unit introduces the concept of supervised learning (covers Unit 2 to Unit 7) and unsupervised learning (covers Unit 8). It is relatively easy, but make sure that you get a good grasp on concepts such as classification vs regression, bias-variance trade-off, training MSE and test MSE. These theories are applied extensively in later units.
2. **Linear Regression**:
   - This unit builds on the knowledge of simple linear regression in MAST20005 and is an extension of linear regression. The KNN method discussed in this unit was quite intuitive for me.

3. **Resampling methods**:
   - Resampling methods involve repeatedly drawing samples from a training set and refitting a model of interest on each sample to obtain additional information about the fitted model.
4. **Subset Selection; shrinkage methods**:
   - Make sure you understand the algorithm of best subset selection, forward stepwise selection, and backward stepwise selection, and be able to implement them in R and interpret the result

5. **Non-linear models**:
   - This unit covers several more complex non-linear models. I would recommend that you spend some extra time to understand how each of these models work and be able to implement each of them in R.
6. **Classification methods**:
   - This unit shifts to the classification setting. It is important to understand which model suits different kinds of datasets, their pros, and cons, as well as whether there are any assumptions made behind the models, for example, the assumptions behind linear discriminant analysis.
7. **Tree based methods**:
   - I found decision trees quite intuitive and fun to implement. Bagging, random forests and boosting are their more complex variations.
8. **Unsupervised learning methods**:
   - This unit takes a different statistical learning approach from the previous chapters and explores situations where the response variable is not present, for example, identifying shoppers with a similar interest. This unit was examinable as well.

Lectures

The structure of the course follows the idea that Shane presents the theoretical side of the statistical methods in lectures and leaves the application/practical side of implementing these statistical methods for tutorials. Shane explains the different models in detail, in a way that I found quite easy to comprehend. Additionally, the lecture material is extracted mostly from the textbook, so the textbook offers more explanation. I also enjoyed the way that Shane structures the course in a very organised way and you will find it very easy to navigate on Canvas.

Tutorials

The tutorials focus on the R applications. I would highly recommend you attend or watch all tutorials and implement the R code by yourself because both assignments and a large proportion of the final exam are based on coding in R. Personally, I feel that the key would be to understand roughly what each line of code is doing and in my tutorial the tutor usually had comments which I found useful.

Assessment

Assignments

Both assignments are quite similar R-based group assignments. Tutorial material and the textbook are really good resources you can refer to. Decent marks can be achieved in both assignments.

End of Semester Exam

Since a larger proportion of the marks comes from R-based questions, the lab material is just as, or even more, important as the lecture content in the preparation of your final exam. Apart from the lectures and tutorials, I would recommend using the after class exercises that Shane organises as a good resource.

It is not enough to just memorise the theory and code. A good way to tackle this subject would be to take a practical approach and try to understand how the models we implement help us achieve our goal. Some example considerations that should be made are (please note that they are not limited to the below):

- What type of problem are you presented with?
- What kind of data are we given?
- Why would you choose a particular model? Are there any other candidate models?
- What are the fundamental assumptions behind your model?
- How would you analyse your model fit based on the R codes?
- What are the advantages and disadvantages of your model?
- How could you improve your model?

ACTL30003 Contingencies [SM2]

Exemption status	CM1 Actuarial Mathematics in conjunction with ACTL20001 *Introductory Financial Mathematics.* Satisfactory performance across the three subjects is required
Prerequisites	ACTL30001 Actuarial Modelling I
Lecturer(s)	Prof David Pitt
Weekly contact hours	2 × 1-hour lecture 1 × 1 hour tutorial
Assessments	Individual assignment 1 × 15% = 15% Individual assignment 1 × 15% = 15% 2-hour end-of-semester exam (hurdle) 70%
Textbook Recommendation	Actuarial Mathematics for Life Contingent Risks, 2nd Edition. ✗ **Not recommended**. Did not touch the textbook throughout the semester and performed well, the lecture slides are sufficient.
Lecture Capture	Full (both audio and video)
Year and Semester Reviewed	2023 Semester 2

Comments

Despite its difficulty, this course was one of the most fun out of all the actuarial subjects. Even though there was a lot of content to cover, Professor David Pitt really made sure to deliver the lectures in the most straightforward and clear way and gave a lot of examples to encourage application-based learning, instead of giving lengthy proofs, and this made the learning process much easier. The subject is well-structured and covers a wide range of related subjects, from single/joint life insurance price through reserving and various decrement models. I enjoyed the subject because it featured extensions of many concepts learned in ACTL20001 Introductory Financial Mathematics and ACTL30001 Actuarial Modelling 1. I highly advise students to spend time developing a solid conceptual foundation rather than memorising equations.

Subject Content

Overall, understanding of probability theory and financial mathematics is essential for this subject. It mainly provides actuarial techniques for calculating premiums and policy values for life insurances and life annuities.

- Overview and select Life Table

Introduces underwriting 'selection effect' concept to differentiate between insured lives and standard population. To reflect this in practice, select life tables are constructed following similar results used in deriving the ultimate mortality table. This concept will be applied throughout the semester.

- Insurance Benefits and Annuities

Teaches core techniques of calculating mean and variance traditional insurance and annuity benefits (whole life, term, etc.). These techniques involve first principles, recursive relationships, and interconnection of various insurance products. What made this challenging was the many new notations introduced, but with a lot of practice, students will find it very easy to identify and interpret them.

- **Premium calculation and Policy valuation**
  This topic prepared us to calculate premiums using the principle of equivalence. Some applications on with-profit insurance and extensions with extra risks were included

afterwards. After premium calculation, the teaching flowed into policy valuation. We learnt profit analysis on an annual basis and Thiele's Different Equation under the context of policy value.

- **Multiple state models**
  This part started with a review of the Markov process learnt in *Actuarial Modelling I*. Topics in multiple state models are extensions of materials in Week 4 to Week 6 where the alive-dead model was used.

- **Joint Life Theory**
  Further to the standard notations in Week 1 to Week 3, functions on joint life, last survivor and contingent life were introduced. The difficulty came from questions that applied these functions. I found drawing timelines to understand the relationships between two lives before writing down formulae is the best approach to tackle these questions.

- **Multiple Decrement Model**
  The multiple decrement model is a special case of the multi-state model where there is one alive state and n absorbing states (not necessarily a dead state). Knowledge on constructing relationships between the single decrement model and multiple decrement model and finding probabilities under fractional age assumptions were discussed.

- **Emerging costs and Unit-linked Insurance**
  So far in the course, we had focused on determining the EPV of cash flow series. This topic mainly talked about how to project the cash flow emerging from a contract in each time period for pricing, reserving and profit testing.

Lectures

All the lectures were delivered by Professor David Pitt. He was very organised and enthusiastic in teaching Contingencies. Lectures notes were concise and well structured. Instead of showing us lengthy proofs, he gave a lot of examples right after explaining a new topic, and it was very helpful to really understand the material he was delivering.

Tutorials

Weekly tutorials are delivered in-person. Personally, I found it beneficial to attempt or at least preview questions beforehand to check your conceptual understanding. Both assignments and exam questions have a similar format to the tutorial – although exam questions are relatively harder. Solutions are provided at the end of every week. Exam tip – practice the tutorial questions as many times as possible until you are confident in answering the different types of questions!

Assessment

Assignments

There were two individual assignments, each consisting of six or seven long answer questions. Some of the questions involve an extensive use of excel spreadsheet, e.g. constructing annuity tables from scratch. Both assignments were comparatively easier than other actuarial subjects, but tedious and took a lot of time. However, they were manageable, and you should be able to score well, if you have good time management skills and understand the lectures' contents.

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EOY Exam

The final exam was in-person. The exam was 2 hours plus 15 minutes of reading time. Students were allowed two A4 sheets of paper with notes, either handwritten and/or typed, on both sides (total 4 pages). I found it beneficial to review lectures whilst writing down formulas into the cheat sheet. This might be a little time-consuming but writing your cheat sheet will allow you to understand and remember the formulas. Otherwise, you can compile weekly summary notes given by your tutor and add any additional notes – this might save you sometime during SWOTVAC!

Exam structure:

There were no MCQ or T/F questions, there were only short and long questions. You must aim to finish each question in less than 15 minutes, which can be challenging as contingencies involve lots of calculations and concept applications.

Exam difficulty and helpful tips:

One word to describe the exam – challenging.

> 1.Don't spend too long on a question.
>
> With the time constraint, if you do not know how to attempt a question, write down the relevant formulas, and move on! You should not spend too much time getting the life table calculations 100% correct – my tutor mentioned that you will get marks for your workings and writing down the correct formulas.
>
> 2. Familiarise yourself with your own cheat sheet and some key formulas
>
> (This will save you a lot of time!)
>
> 3.Utilise the reading time
>
> This is the time before your marathon when you sit down and think hard. During this time, plan your exam strategy. I tried to attempt every question even if it's only by writing down formulas in a question.
>
> All in all, despite the difficulty, Contingencies is one of my favourite subjects in B-com in terms of content and the great lecturer! Best of luck with your exams!

ACTL30004 Actuarial Statistics [SM2]

Exemption status	CS1 Actuarial Statistics, in conjunction with MAST20004 *Probability* and MAST20005 *Statistics.* Satisfactory performance across the three subjects is required
Prerequisites	MAST20005 Statistics
Lecturer(s)	Dr Enrique Calderin
Weekly contact hours	1 × 2-hour lecture 1 × 1 hour tutorial
Assessments	Individual assignment 1 × 15% = 15% Individual assignment 1 × 15% = 15% 2-hour end-of-semester exam (hurdle) 70%
Textbook Recommendation	Prescribed Readings Actuarial Statistics Lecture Slides Supplementary Readings Frees, E. W., Derrig, R. A. and Meyers, G. (eds) (2014) Predictive Modelling Applications in Actuarial Science. Cambridge: Cambridge University Press (International Series on Actuarial Science). Boland, P., 2007. Statistical And Probabilistic Methods In Actuarial Science. 1st ed. CRC Press. De Jong, P. and Heller, G., 2013. Generalized Linear Models For Insurance Data. Cambridge: Cambridge University Press.
Lecture Capture	Full (both audio and video)
Year and Semester Reviewed	2023 Semester 2

Subject Content

1. Exploratory data analysis with R

Analysing datasets and summarising their key characteristics using R – includes modelling the data, hypothesis testing and using graphical methods to analyse their key characteristics.

2. Properties of estimation and estimators

Maximum likelihood estimation, properties of estimators, unbiasedness and mean-square error and bootstrap methods. While this topic is very similar to Statistics, it serves as an extension to the subject.

3. Multiple linear regression

Performing multiple linear regression in R and conducting residual analysis, multicollinearity tests and variable selection methods. Knowing the ANOVA table and statistical inferences of MLR coefficients are also necessary.

4. Generalised linear model

Generalised linear models are an extension of MLR by removing the assumption of Normally distributed variables. The topic is quite long and covers exponential family of probability distributions, Fisher-scoring algorithm, deviance and likelihood ratio tests and residual analysis.

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5. Credibility theory

This topic covers Bayesian inference and estimators, credibility premium and empirical Bayes credibility theory models. The main idea of this topic is to estimate risk experience for an individual by combining their individual experience with that of a larger group.

Lectures

The first few lectures were quite easy to follow along as they were mainly focused on R and the content is very similar to ACTL30008 from the previous semester. However, it gradually got a lot more difficult to follow along when numerous proofs are introduced in the lectures – this is especially true for Topic 4 Generalised Linear Model. While these proofs are not especially relevant for the final exam, they may be beneficial to the assignments. It's worth noting that adjusting to Enrique's accent and handwriting may be difficult initially. Fortunately, the lecture slides are quite comprehensive and are reliable resources for reference.

Tutorials

The first few lectures were quite easy to follow along as they were mainly focused on R and the content is very similar to AAD from the previous semester. However, it gradually got a lot more difficult to follow along when numerous proofs are introduced in the lectures – this is especially true for Topic 4 GLM. While these proofs are not especially relevant for the final exam, they may be beneficial to the assignments. It's worth noting that adjusting to Enrique's accent and handwriting may be difficult initially. Fortunately, the lecture slides are quite comprehensive and are reliable resources for reference.

Assessment

There were 2 equally weighted individual assignments for this subject, both heavily involving the use of R. The concepts and questions tested in assignments are just variation of the lecture slides and tutorial worksheet, so it is not too difficult to score well. Just make sure to read the assignment rubric on LMS as Enrique marks the assignments based of off that and those who did not follow the rubric lost some straightforward marks.

The end-of-semester exam was an in-person 2-hour exam with 15 minutes reading time. Unlike most actuarial exams, we were not allowed to bring in any cheat sheets. Instead, Enrique provided a formula sheet with the exam; however, this formula sheet was not available to access prior to the exam. While important and difficult formulae were provided in the formula sheet, some minor formulae and definitions were not provided. Hence, I would recommend memorising some formulae. The subject requires a heavy use R, especially with the assignments but not so much for the exam.

Overall Remarks

Initially, this subject was quite challenging to follow along through the semester, but the exam review process was more manageable than expected. Some of the topics covered in the subject overlaps with parts of Statistics and AAD1 contents, so if you have strong foundations for these subjects, Actuarial Statistics should not be too difficult. Personally, I found the topic Generalised Linear Models to be the most difficult as it was a new topic and required deeper understanding of statistical concepts and parameter estimation techniques.

ACTL30006 Intermediate Financial Mathematics [SM2]

Exemption status	CM2 Financial Engineering and Loss Reserving in conjunction with ACTL20004 *Topics in Actuarial Studies* and ACTL40004 *Advanced Financial Mathematics.* Satisfactory performance across the three subjects is required
Prerequisites	ACTL20003 Stochastic Techniques in Insurance ACTL20004 Topics in Actuarial Studies
Lecturer(s)	A/Prof Han Li
Weekly contact hours	2 × 1-hour lecture 1 × 1 hour tutorial
Assessments	Individual assignments 2 × 15% = 30% 2-hour end-of-semester exam (hurdle) 70%
Textbook Recommendation	None
Lecture Capture	Full (both audio and video)
Year and Semester Reviewed	2023 Semester 2

Comments

In 2024, the assessment structure will be:
- Individual Assignment 1 x 10% = 10%
- Mid-semester Test 1 x 10% = 10%
- Individual Assignment 1 x 10% = 10%
- 2-hour end-of-semester exam (hurdle) 70%

Note that this review does not provide an insight into any mid-semester test for ACTL30006, as it was not part of the assessment in 2023 Semester 2

Subject Content

- **Topic 1 – Modern Portfolio Theory**
  The objective of the modern portfolio theory is to maximise the risk-return trade-off when investing in the markets through the use of mathematical tools. Notably, in financial mathematics, we generally focused on the future rather than the past. Therefore, the expected return is the centre of focus.

- **Topic 2 – Mean-variance Theory**
  The mean-variance theory provides a way of choosing a combination of assets based on the idea that investors only care about mean-variance efficiency. This topic guides you through the steps of constructing an opportunity set and finding efficient frontier and typical portfolios.

- **Topic 3 – Single-factor Model and Multi-factor Model**
  These two models simplify the mean-variance theory by relating assets to the market portfolio, which largely reduces the number of variables required for analysis.

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- **Topic 4 – Expected Utility Theory**
  Expected Utility Theory helps to choose portfolios by giving assumptions on risk preferences. This is in comparison to the mean-variance analysis, which does not show which portfolio to hold, which instead reduces the set of investments worth considering.

- **Topic 5 – Geometric Means**
  Given the previous two criteria in portfolio selection (mean-variance criteria and expected utility theory), geometric means is another method used for long-time (lifetime) growth of a portfolio.

- **Topic 6 – Stochastic Dominance**
  The three criteria derived so far require very strong assumptions on the investor. Here, Stochastic Dominance requires strong assumptions on the investments, but only very weak assumptions on the investor.

- **Topic 7 – Capital Pricing Asset Model**
  Depending on the investor's analysing ability, the investment pool varies from investor to investor. The CAPM develops a simple relationship between the expected return of an asset and its covariance with the market portfolio by making an unrealistic assumption that investors have identical analysing abilities.

- **Topic 8 – Arbitrage Pricing Theory**
  APT provides analysis based on the multiple factor model but with no diversifiable risk involved

- **Topic 9 – Efficiency and Rationality**
  This lecture examines three different forms of market efficiency. It is one of the most theoretical topics in the subject.

- **Topic 10 – Value at Risk**
  To this point, the variance has been used as the principal measure of risk. Value at Risk is another measure of risk that compensates for some disadvantages of the variance. For example, the variance penalises upside variance as well as down-size variance.

Lectures and Tutorials

In her lectures, Han does a great job explaining things, along with demonstrating guided examples for each key concept. However, that's not the main reason why you should pay close attention to the lectures in this subject. Unlike most other subjects, the tutorials questions did not fully capture most of the examinable content, so it's worth giving extra priority to the lecture slides during exam preparation. I also found the tutorial questions to be misleadingly easy, such that I was caught off guard by a lot of the questions in the final exam. To summarise, I believe lectures are more important than the tutorials for this subject, whereas the converse is true for all other third year actuarial subjects.

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Assessment

Assignment 1 (15%):

The first assignment was fully completed in an Excel spreadsheet, where we had to construct efficient portfolios for a mean-variance investor. It was quite straightforward and is easily completable in one afternoon, although I would recommend double and triple checking your work since mistakes are quite hard to detect when you skim the excel outputs.

Assignment 2 (15%):

The second assignment was also done in Excel, and was focused on the concept of stochastic dominance. I found the premise to be also quite straightforward, although making Excel produce the desired output will require using Google/ChatGPT to research some Excel functions that were not used in previous coursework. It is still doable in an afternoon.

Final Exam (70% - Hurdle)

Based on previous years' subject reviews, I've always read that the exam in this subject is disproportionately harder than the tutorials. Since we did not get a practice/past exam, I thought this year the tutorials would be an accurate reflection of the exam's question styles and difficulty; I was wrong. Although the calculations were comparable to some of the harder tutorial questions, the exam attributed numerous marks to stating the assumptions of the different theories and models taught (Single-factor, CAPM, APT, etc.), which was essentially neglected in the tutorials. Hence, it's important to be comfortable with all the qualitative theory in the lectures.

Overall Remarks

This subject was a breath of fresh air from the insurance-focused subjects in 3rd year, and explores the different approaches and considerations when it comes to building an investment portfolio based on quantitative factors. I imagine that this would be the perfect subject for any actuarial student interested in quantitative finance and portfolio management.

Subject Reviews: Graduate Subjects

ACTL90003 Mathematics of Finance III [SM1]

Exemption status	CM2 Financial Engineering and Loss Reserving, in conjunction with ACTL20004 *Topics in Actuarial Studies* and ACTL30006 *Intermediate Financial Mathematics*. Satisfactory performance across the three subjects is required
Prerequisites	ACTL90002 Mathematics of Finance II
Lecturer(s)	Dr Zhuo Jin
Weekly contact hours	3 × 1-hour lecture (with two lectures that get replaced by tutorial practice time)
Assessments	Mid-semester exam 10% Individual Assignment 20% End-of-semester exam (hurdle) 70%
Textbook Recommendation	N/A
Lecture Capture	Full (both audio and video)
Year and Semester Reviewed	2021 Semester 1

Comments

It was very exciting to know that MoF3 is the last subject in the Part I qualification. The beauty of this subject is that some content taught in this subject is highly applicable in practice. Especially, the Black-Scholes model was the first widely used model for option pricing. The first half of the lecture materials (Weeks 1-6) are the building blocks and mathematical tools for understanding the derivation and application of the Black-Scholes formula, including risk-neutral pricing, martingales, Brownian motion, and Stochastic Calculus. The last three weeks are an introduction to simple interest rate derivatives and credit derivatives.

As everything sounded new to us, this subject could be daunting, especially during the first half, when it was difficult to see connections between topics. Moreover, you might get lost when starting to learn Stochastic Integrals, as it deviates quite a bit from the technique of Riemann Integral, which is the definite integral we normally encounter in calculus texts.

Subject Content

As I have mentioned above, the first six weeks are about the mathematical foundation of understanding the Black-Scholes formula. Weeks 7-9 give a comprehensive overview of the Black-Scholes model, and you can research more in-depth concepts related to this topic if it appeals to you. The last three weeks change the objective to making interest rate stochastic rather than the stock price and the subject concludes with an introduction of default/credit risk.

Lectures

In terms of time commitment, I had a three-hour lecture per week rather than a two-hour lecture that I had been used to during the bachelor's course. Twelve more lectures mean more time and energy needed to absorb knowledge, take notes and revise for the final exam. I should not forget to mention that we still have specimen questions included in the lecture notes for us to practice weekly. As there is no tutorial, you might get less motivated to keep up with practice. I would recommend you attempt them weekly as some questions can be difficult at first sight and you will regret it if all of them are left to SWOTVAC.

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Tutorials
N/A

Assessment

Mid-term exam
The mid-term exam was quite interesting as it looked pretty like the specimen paper, we were provided a few weeks before the exam. Therefore, to maximise your utility, make sure you practice the specimen paper a few times and familiarise yourself with lecture notes, so you know where to quickly look during the exam if it is open book. (p.s. I can only be sure that this will be the case in 2022.) You will only be given one hour to complete it.

Assignment
This subject has one assignment due at the end of the semester and it was released two weeks prior to the due date in my year. I felt that the assignment was easy, and we were required to build an Excel spreadsheet for option pricing using a hundred steps binomial tree and the Black-Scholes formula. Your life will be easier if you have completed the lecture materials up until week 8. You still need to be careful about it as it is quite heavily weighted (20%).

Final exam
The final exam consisted of 10 multiple choice questions and eight long answer questions. Admittedly, those long answer questions were much more complicated than the weekly specimen questions. It required a holistic understanding of the concepts of a class of methods or models. One tip I can give is that you might find the revision tutorial (the last lecture in the semester) to be very useful, as those are the key concepts and are highly likely to be examined in the final exam.

ACTL90010 Actuarial Practice and Control I [SM1]

Exemption status	ACC: Actuarial Control Cycle, in conjunction with ACTL90011 *Actuarial Practice and Control II.* Satisfactory performance across both the subjects is required
Prerequisites	Admission into one of the following: MC-ACTSC Master of Actuarial Science, MC-ACTSCEN Master of Actuarial Science (Enhanced) AND Completion of a minimum of 100 credit points of study (including 4 core subjects; or equivalent)
Lecturer(s)	David Heath, Julian Gribble, Donald Campbell
Weekly contact hours	2 × 2-hour recorded lectures
Assessments	Tutorial participation and preparation: 6% Assessable test: 1 × 4% = 4% Individual assignment 1 × 10% = 10% Individual assignment 1 × 10% = 10% 3-hour end-of-semester exam (hurdle) 70%
Textbook Recommendation	Bellis, C., Lyon, R., Klugman, S., & Shepherd, J. (Eds.). (2010). Understanding Actuarial Management: the actuarial control cycle (2nd ed.). Sydney, AU: The Institute of Actuaries of Australia The textbook is ✗ **Not recommended**. I personally did not use it, instead relying on background documents posted on the LMS which were important, useful, and examinable. This included background/fundamental knowledge on general/life insurance and superannuation, which were the building blocks upon which the lecture material expanded.
Lecture Capture	Full (both audio and video)
Year and Semester Reviewed	2022 Semester 1

Comments

David prefaced the subject – and consistently reminded us – that this was unlike any actuarial subject we would have studied previously. This subject focuses on largely the three lines of general insurance, life insurance and superannuation. It was a movement away from typical actuarial theories and formulas, instead placing us in the shoes of an actuarial consultant, and the considerations and decision making that come with it. David often stressed that in this subject, it was critical to take into consideration different stakeholder perspectives, something that I found to work well in assessments. It was also made apparent to us that there are different ways of viewing and answering a problem.

The content followed a very structured approach, in which the content was delivered covering seven learning objectives, based upon the syllabus of the Actuaries Institute. Throughout the lectures, these objectives would be referred to, to make it easier for us to recognise the relevance of the content, and structure our revision.

Overall, this subject was a welcome change from the standard mathematic-heavy subjects studied prior and gave us an insight into the larger picture of life as an actuary, beyond the theory.

Subject Content

As mentioned, the content covered seven learning objectives, based upon the actuary program of the Actuaries Institute:

- Discuss and apply an Actuarial Control Cycle in a variety of practical commercial situations 2.
- Relate the main features within the general environment to medium and long-term commercial decisions
- Analyse the main features and risks of financial product and contracts, from the point of view of consumers and providers
- Demonstrate an understanding of Enterprise Risk Management
- Apply a risk assessment framework in a range of situations
- Discuss and apply the process of product design
- Understand how models are used to solve client problems

We were often told that the subject was a balancing of these learning objectives, and that for our assessments, problems would consider an interaction of these objectives.

Personally, I found objectives 4 and 5 the most difficult to understand, however there were a couple of specialised lectures on these to help provide greater understanding, and this part of the content was in my opinion the least interesting. There was a large crossover in these 2 objectives with MULT90014 (Business Risk Management). The only quantitative/mathematical part of the content was one lecture on reinsurance (which did appear on the exam).

Lectures

Each lecturer focussed on different aspects of the unit given their different specialities, with David focussing on general insurance, Julian on life insurance and risk management and Donald on superannuation, although all three also covered more general concepts. David and Donald's lectures were delivered in person and online, and I would recommend attending on-campus as there were many interesting discussions to be had – something that David also stressed. I did find that some of the later lectures were a bit repetitive, but they expanded on topics covered earlier, and were to our benefit as they covered important topics that previous cohorts had struggled on. Julian's lectures were uploaded to the LMS and split into 5 or 6 parts, normally totalling between 1.5 – 2 hours per lecture.

I often found it difficult to take all my notes in a lecture, especially the more content-heavy ones, and there was rarely a break in the 2 hours lectures. I would normally re-watch the uploaded lectures to cover anything I missed. On the occasions which I couldn't attend campus, watching the uploaded recordings was a little tiresome, and I often found myself watching on 2x speed.

Each lecture was prefaced with which learning objective(s) was covered, and the lecturer would highlight this. While they tried to cover each learning objective in sequential order, it got a little bit confusing when moving from one objective to another, especially when a totally new topic was covered in the next lecture.

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Tutorials

N/A

Assessment

Assignment

There was one assignment, which was a group assignment (3-4 members) worth 30% of the total grade. Groups were assigned for us. We were positioned as members within the actuarial division of a financial services company, which provided different products. We were tasked to work as a group and write a report which covered the risks faced for each product, following the 'control cycle' and 'enterprise risk management' approach which was taught.

A draft report (worth 30% of the assignment marks) was due within 3 weeks of the assignment release, and feedback was provided on this. The assignment was designed this way to allow us to incorporate this feedback into our final report, which was due around 3 weeks later. I personally found the feedback provided by David to be very helpful, as it highlighted when we were on the wrong path and where we were focussing too much/little attention.

End of Semester Exam:

The exam was online on the LMS, open book, and 3 hours as well as 30 minutes uploading time. It was worth 70% of the total unit marks. During the revision lectures, we were given the exam format, as well as suggestions as to which questions would cover which topics. Exam technique was also thoroughly discussed, in which it was emphasised that answering the question directly would be rewarded rather than regurgitating notes, something that I found to be true with the marking scheme. Majority of the marks were awarded for covering the 'major points', and the remaining marks for embellishing your responses with other details. Thus, it was critical to answer every question on the exam and not fine-tune them unless time permitted, otherwise you could be missing out on achievable marks. Other recommended techniques included forming your own exam-style questions (using inspiration from the 2 practise papers provided) and awarding a mark scheme for these devised questions, then swapping with other students. Additionally, each question covered multiple learning objectives, so it was important to practise weaving these different objectives into your answers.

The 3 hours should be ample time to complete the paper, although the luxury of panning through notes and lecture slides would hamper you if the content wasn't thoroughly revised. I would say that over the course of the semester, the lectures helped prepare me for the exam in that my mindset and thought process when viewing a problem shifted by week 12.

ACTL90004 Insurance Risk Models [SM1]

Exemption status	None
Prerequisites	Admission into the MC-COMACTS Master of Commerce (Actuarial Science)
Lecturer(s)	Dr Enrique Calderin & Prof Shuanming Li
Weekly contact hours	3 x 1-hour lectures, some of which are tutorials
Assessments	1-hour mid-semester exam 10%, Individual assignment (problems) 20% 3-hour end of semester exam (open book) 70%
Textbook Recommendation	Dickson, D. C. M. (2005). Insurance Risk and Ruin. Cambridge, UK: Cambridge University Press. The textbook is ✗ **Not recommended**. I personally did not use it, instead relied upon the questions sets that were provided by lecturers. These were based on each topic, some of which were from the textbook.
Lecture Capture	Full (both audio and video)
Year and Semester Reviewed	2022 Semester 1

Comments

This subject is interesting in that a tangible connection between actuarial theory and insurance is a feature, with a big application being re-insurance, which features heavily in many of the units. Most of the units/topics were relatively new to me, including premium principles and stochastic ordering, so it was fascinating to be exposed to this. This subject has a heavy proof and theorem focus, in that most lectures will introduce theories, go through their proofs, followed by applications of these theories. The lectures and units are structured in a way that much of the content builds upon itself and is used later in the subject. Units 1 and 2 were important fundamentals which were picked up and used in later applications of subsequent units.

The professors were very knowledgeable and clear and were happy to take any questions in lectures or on the discussion forums. They also went out of their way to provide detailed solutions to problem sets and tutorial questions, so that even if the speed was quite quick in class, there was plenty of resources on the LMS to follow up on.

Subject Content

This subject is split into 5 units:

1. Utility Theory:
   - Introduction to how utility theory affects decision making, different types of utility functions, and insurance applications of utility theory including re-insurance. Introduces Jensen's inequality and risk aversion theory
2. Principles of Premium calculation
   - A crucial part of the subject, which introduces different types of insurance premium calculation methods, their properties and how they relate to re-insurance.

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3.   Optimal Reinsurance
- Quite a repetitive but interesting unit, in which various theories/lemmas are proven to demonstrate the optimal type of reinsurance, including stop-loss, excess of loss and proportional reinsurance. Such proofs are quite like what is expected in assignments and the exam.

4. Ruin theory
- In my experience, the most difficult part of the course. Extends on prior knowledge of ruin theory, by demonstrating how it is used in reinsurance. Provides greater insight into the actual application of ruin theory, utilising Poisson process. A bit disjointed in that we were also taught Laplace theorem, and it was initially unclear what the relation to ruin theory was.

5. Risk measures and stochastic ordering
- Introduces risk measures such as value at risk, TVaR, conditional tail expectation. Then delves into their properties, and relationships between these risk measures. Stochastic ordering was an interesting part of the unit, where we were taught how to compare different risks. However, theories were quite abstract and took a while to grasp.

Personally, I found units 4 and 5 the most difficult to understand, they were also more theoretical than previous units and the connection to insurance was less material in my view.

Lectures

Units 1, 2 and 3 were taught by Prof Shuanming Li, the last 2 by Dr Calderin. Rather than weekly tutorials, after each unit, one lecture was dedicated as a tutorial session for the lecturer to go through the tutorial questions. For me, these seemed a little rushed, and I found myself having to watch the re-recordings to understand the tutorial questions fully. Overall, both lecturers were excellent, with both providing extra details and techniques which weren't necessarily covered in the lecture material but were useful when answering tutorial questions. These questions were supplemented with both typed and handwritten solutions which went into more detail, personally I found the typed solutions to be too vague, often struggling to see how solutions were constructed.

Tutorials

N/A

Assessment

Assignment

Consisted of 6 questions, each with multiple parts, to be completed individually and submitted in week 12. Contributed 20% of unit mark. The questions encapsulated all 5 units of the subject, which I found a little problematic as we hadn't learnt all of unit 5 by the time the assignment was released, which was needed for the assignment. Difficulty largely followed that of the tutorial questions and extra problem sheets, perhaps a little more complex. The use of programming languages such as R was recommended for one question, despite

programming not being part of the subject or being taught. Assignment submission requirements were typed (or handwritten and scanned) solutions, along with any programming code.

Mid-semester test:

This was held in week 7 for one hour (including reading time), was open book over the LMS, and was worth 10%. There was a mix of true/false questions, MCQ's and 3 short answer questions. Covered material included units 1, 2 and most of unit 3, with 2 practise papers being uploaded on the LMS. Answers were to be scanned and uploaded within the hour, a time limit that I personally found a little restricting.

Exam:

The exam was online on the LMS, open book, and 3 hours as well as 30 minutes uploading time and 15 minutes reading time. The exam consisted of around 15 multiple choices or true/false questions, and 8 short answer questions. Marks for these short answer questions weren't distributed evenly, reflecting that some questions were longer and more difficult than others. The open book allowance was very much welcomed, as there was a wealth of theorems, lemmas and proofs that were required to be utilised. This said, it wasn't necessarily the replication of these theorems and proofs that was assessed, rather the underlying techniques that were to be employed when answering questions. A few of these short answer questions required numerical calculations and decimal point answers, however a large proportion of questions were 'show that' questions, proofs or problems which needed you to suggest a possible solution.

> The time limit should be ample time to complete the paper, although the luxury of panning through and re-studying notes and proofs would limit your capacity to answer all questions. Techniques suggested and covered through lectures and 'tutorials' were applicable and helpful in the exam; however, it is certainly true that there is much assumed knowledge in terms of mathematical techniques that was used, as with most actuarial subjects.

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ACTL90020 General Insurance Modelling [SM1]

Exemption status	*CS2 Risk Modelling and Survival Analysis, in conjunction with ACTL90006 Life Insurance Models I and ACTL90007 Life Insurance Models II.* Satisfactory performance across all three subjects is required.
Prerequisites	Admission into the MC-COMACTS Master of Commerce (Actuarial Science)
Lecturer(s)	Prof Benjamin Avanzi
Weekly contact hours	1x 2-hour lecture 1x 2-hour tutorial
Assessments	Mid-semester exam (Week 7) 15% Individual video presentation (Week 10) 25% 3-hour, open book, end-of-semester exam 60%
Textbook Recommendation	• [MW]: Wuthrich, Mario V., Non-Life Insurance: Mathematics & Statistics (December 17, 2020) ✓ Recommended • [TS]: Shumway, Robert H., Stoffer, David S. (2017) Time Series Analysis and Its Applications With R Examples, Springer ✗ **Not recommended** • [CS2]: Institute and Faculty of Actuaries, CS2 Core Reading, Unit 3 Copulas and Unit 4 Extreme Value Theory ✗ **Not recommended**
Lecture Capture	Full (both audio and video)
Year and Semester Reviewed	2023 Semester 1

Comments

General Insurance Modelling is a very grounded and practical subject. It does a good job at applying the techniques learned to their real-world applications. It is quite content heavy; however, this is mainly due to the large volume of examples and out-of-scope material. I found that simply understanding the main concepts was enough. The subject was fun, especially when applying what we learned in class, and wasn't too difficult overall.

MAST2004 Probability and MAST2005 Statistics are prerequisites for this subject. Retaining knowledge from these two is important, as much of the content assumes you already know random variables, density functions, and how to use R at a basic level.

Subject Content

The overall content can be divided into two parts.

Part 1 – Claims Modelling
Module 2: Collective Risk Modelling
Module 3: Individual Claim Size Modelling
Module 4: Approximations for compound distributions
Module 5: Copulas

Part 2 – Time Series
Module 7: Characteristics of Time Series
Module 8: Times Series Regression and Exploratory Data Analysis
Module 9: Time Series Models
Module 10: Estimation and Forecasting

Lectures

Benjamin will usually go through the lectures one module at a time, however sometimes devoted two weeks to the longer ones. Although the slides are self-explanatory, his notes and explanations added extra depth and understanding that proved helpful. He also made the effort to remember our names, making lectures worthwhile attending in person

Tutorials

As our tutorials were two hours long, just about every question we had about the problems could be answered. It also allowed Benjamin to go into detail on the harder questions, which was helpful for our understanding. The extra hour was a huge privilege for us postgraduate students to have, and I therefore highly recommend attending these classes every week.

Assessment

Mid-semester Exam:

This midterm was very standard for most actuarial subjects, and was a one-hour, closed book, written exam held in person. It covered all of modules 2 to 5, and the questions were in a similar format to those in the pre-tutorials. I found that attending tutorials and answering all the practice questions was sufficient preparation.

Assignments:

This assessment is one of the most unique I have done in the course. We were given a set of claims data and asked to compare two reinsurance policies, which had to be presented in a video format. Despite having to work with the data using R, none of our code was assessed, but rather our conclusions and presentation in the video we created. It was therefore extremely important to not get bogged down in the individual details, but rather holistically conclude what our models achieved, and any limitations they may have had.

End-of-Semester Exam:

The format was a 2-in-3 hour, online, open book exam which was conducted as a quiz on the LMS. Some questions were multiple choice, whereas others were long answer and needed detailed explanations. Most of the problems required us to use R to perform calculations, as well as data analysis on some individual sets provided before the exam started. I found the practice exams and tutorial questions sufficient to help prepare and had no issue with timing due to the extra hour given.

ACTL90022 Economics for Actuaries [SM1]

Exemption status	*CB2 Business Economics. Satisfactory performance across this is required.*
Prerequisites	Admission into the MC-ACTSC Master of Actuarial Science
Lecturer(s)	Jonathan Thong
Weekly contact hours	2x 1-hour lecture 1x 1-hour tutorial
Assessments	Mid-semester exam (Week 7) 20% Individual or group assignment due in Week 11 10% 2-hour, closed book, end-of-semester exam 70%
Textbook Recommendation	None
Lecture Capture	Lectures only (both audio and video)
Year and Semester Reviewed	2023 Semester 1

Comments

This subject covers the most important concepts of micro and macroeconomics and was overall very interesting. Jonathan is very engaging and does a great job at condensing a large amount of content into only 12 weeks. Actuarial students should not find the maths used in this subject difficult, as only basic calculus and algebra is required.

Subject Content

The subject is split into two parts which last 6 weeks each.

Microeconomics – Economic decision making, competitive markets, consumer theory, the firm's problem, imperfect competition, price discrimination. Inefficient outcomes & market failure.

Macroeconomics – Representing & measuring the macroeconomy, the monetary system, the goods & money markets, labour markets & general equilibrium, the business cycle & long run growth, international trade & exchange rates.

Lectures

Lectures are recorded and uploaded to the LMS; however, attending is recommended as it is easy to fall behind on the content due to its volume. This subject is essentially covering both microeconomics and macroeconomics, which are two separate first year subjects, into one.

Tutorials

Although solutions to the tutorials are uploaded to the LMS, these classes are not recorded. Jonathan does a good job of explaining each of the steps that go into solving the problems, so attendance is recommended.

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Assessment

Mid-semester Exam:

While the content in the midterm itself closely followed the tutorials and was not too difficult, there were too many questions for only 50 minutes of writing time. No reading time was provided either, making the exam hard to finish. Luckily Jonathan recognised this afterwards and ended up scaling our grades to compensate.

Assignments:

We were given a macroeconomic assignment in week 9 which could be completed individually, or in a group. It required us to choose a country of interest and write a 2000-word essay about their economy over the last 10-15 years. This was quite fun, and really gave us an insight into not only the country talked about, but also the state of the world.

End-of-Semester Exam:

The format was a 2-hour, in person, closed book exam with both multiple choice and short answer questions. I found this quite straightforward, and doing the tutorial questions and practice exam was sufficient to prepare.

ACTL90019 Data Analytics in Insurance 2 [SM2]

Exemption status	DSP Data Science Principles. Satisfactory performance in this subject is required
Prerequisites	ACTL90023 Data Analytics in Insurance I ACTL90008 Statistical Techniques in Insurance ACTL30004 Actuarial Statistics
Lecturer(s)	Genevieve Hayes
Weekly contact hours	1 × 2-hour lecture 1 × 1 hour tutorial
Assessments	Assignment 1 × 10% = 20% Assignment 1 × 10% = 20% End-of-semester exam (hurdle) 60%
Textbook Recommendation	Raschka, S. and Mirjalili, V. (2019). Python Machine Learning (3rd ed). ✗ **Not recommended**. – Did not realise there was a textbook (and so did not need the textbook) until reading the handbook
Lecture Capture	Full (both audio and video)
Year and Semester Reviewed	2023 Semester 2

Subject Content

Those that have taken Actuarial Analytics and Data I (ACTL30008) will find this subject to be very familiar. The main differences are that this subject is taught in Python (instead of R), and there is a greater focus on details other than the fancy machine learning algorithms.

Machine Learning Models
Covers the main machine learning algorithms you are likely to encounter. Some of these (e.g. Linear Regression, Decision Trees, K-Nearest Neighbours) will be revision from ACTL30008, but there are also some new models like Support Vector Machines and Neural Networks. There is also a revision of hyperparameter tuning and cross-validation.

Data Processing and Feature Engineering
This topic is all about manipulating your raw data before sending it to your machine learning models from topic 1. It may sound straightforward, but it will require significant levels of judgement.

Unsupervised Learning
Again, some of these algorithms have been covered in ACTL30008 (e.g. K-Means Clustering and PCA), but there are some new algorithms to learn (e.g. DBSCAN, Local Linear Embedding). Compared to ACTL30008, there is slightly more emphasis on evaluation metrics for these unsupervised algorithms.

Production-Ready Code
This topic is covered in the final lecture of the semester. It emphasises what makes this subject so different from any other machine learning subject I have taken. The focus is entirely on real-world practicality as opposed to the fine details of each algorithm.

Overall, the content was very high-level compared to ACTL30008 and other machine learning courses from either the Maths or Computer Science departments, but it works. The focus in this subject is more about the interpretation of results and how to communicate these effectively.

Lectures

Taking this subject without watching lectures would be near impossible. The slides are useful but are extremely sparse on their own. However, the way Genevieve structures the lectures makes it clear why the slides are the way they are. The lectures themselves are extremely engaging, with Genevieve providing many examples throughout to make things as relatable as possible. There's plenty of back and forth between theory and code, which is a huge plus. Also, free chocolate is hard to pass up :)

Tutorials

Each week, there was a problem sheet to complete. These were mostly coding-based, however there were a few questions related to the interpretation of results, which was equally important. The tutorials themselves involved going through code required to answer the questions, as well as discussing the interpretations of each result.

Assessment

Assignment 1

Both assignments were very similar. They were both individual assignments that related to a dataset of your choice (the same dataset was used for both assignments). Tip: choose a dataset that you are genuinely interested in. We had over 1 month to work on each assignment: the first was due around week 7, and the second in week 12. They each involved some coding; however, the bulk of the marks were related to the 12-page report describing the coding process and results. Again, there is a major emphasis on being able to explain what you are doing to those from a non-technical background. The focus in Assignment 1 was on the first few machine learning models and hyperparameter tuning. There was a rubric provided, but many students seemed to ignore this and consequently performed poorly. So please read the rubric and follow it closely.

Assignment 2

The structure of this assignment was the same as Assignment 1, however the coding was more focused on the data processing and feature engineering side as opposed to building machine learning models. We used our best performing model from Assignment 1, as well as bagging, boosting and neural networks. Again, the bulk of the marks were in the report. Overall performance on this assignment was significantly better than the first one. Ultimately, I enjoyed completing both assignments. Even though the assignments were very structured, there was plenty of freedom in terms of choosing a dataset, writing your code, and creating a report.

Final Exam

The final exam was a 3-hour exam held in the Royal Exhibition Building. Unlike most other in-person exams, this one was typed. It required you to bring your own laptop (or borrow one in advance from the university) and answer each question on a canvas quiz. The questions were all theory-based and involved no coding or mathematics. They required you to have an in-depth knowledge of each algorithm and metric studied in lectures, as well as the associated hyperparameters for each model. While some questions were very straightforward, there were others that were very open-ended. And even though you could type all your

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answers, the exam was still very time pressured. Personally, the exam was harder than I was expecting. I believe the highest raw score on the exam was just below 80%. Thank goodness for scaling.

Overall Remarks

Overall, the subject was not too different from ACTL30008. My biggest piece of advice would be to learn Python before taking this subject. A great way to do so is to take Foundations of Computing (COMP10001) as a breadth subject in your undergraduate degree. Otherwise, there are plenty of free resources on the internet for learning the language. The first tutorial provides a very brief introduction to Python, as well as the main packages used in this subject (pandas, numpy, sci-kit learn, maybe matplotlib), but I would strongly recommend learning these before starting this subject. Otherwise, you may find it difficult to keep up with the content. In saying this, make sure to focus equally on the theory behind the code, as this will come in handy on the assignments and the final exam.

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Subject Reviews: Breadth and Elective Subjects

Important Note: Regardless of what you have been told, it is **NOT** compulsory for you to complete a coding related breadth subject. Melbourne University offers a wide array of breadth subjects in the Arts, Music, Languages, Education and Sciences and so you should find one that peaks your interest.

BLAW10001 Principles of Business Law [SM1]

Lecturer(s)	Dr Tanya Josev A/Prof Arlen Duke
Weekly contact hours	2-hour pre-recorded lecture Optional discussion boards, drop-in zoom consultations
Assessments	2 x Online Quizzes 20% Final Exam 80%
Textbook Recommendation	Lambiris, M, Griffin, L, 2020, First Principles of Business Law, 11th edn, Thomson Reuters
Lecture Capture	Full (both audio and video)
Year and Semester Reviewed	2022 Semester 1

Comments

Principles of Business Law (BLAW10001) is a breath of fresh air as compared to actuarial subjects that you have undertaken. As all materials are conducted online, you will be able to go at your own pace. However, it has a different format as compared to commerce subjects and is content-heavy. Personally, I found the subject very interesting and was able to score well with some effort.

Subject Content

Introduction
1. The nature and function of law
   This topic introduces different types of law (contract law, agency law, etc.) and who can "make" law.
2. Legislation as a source of law
   This topic explores the legislative process in detail and the different sources of law in Australia.
3. Role of the courts in law-making
   This topic outlines the civil trial process, explores case-law as a source of law, the origins of common law and equity, and how to interpret case-law by analogy. There are a couple of important law jargon introduced such as 'stare decisis' and 'ratio decidendi'.

Contract law topics:
4. Contract Formation
   This topic gives an overview of contract law, the importance of contract law, the objective approach, executory/bilateral versus unilateral contracts, capacity to contract, the formation requirements of a contract, privity of contract, and estoppel.
5. Terms of a Contract
   This topic presents the terms of a contract which are essential in deciding whether a contract has been breached. It also explores the freedom of contract, how terms are final once the contract is formed, how express terms become part of a contract, and various implied terms in a contract.
6. Discharge of Contractual Obligation
   This topic introduces different levels of performance and different types of breach. In addition, the concepts of performance of divisible contract and frustration are introduced.
7. Remedies for Breach of Contract
   This topic explores the various remedies that are available for breach of contract (common law remedies, equitable remedies, statutory remedies, and agreed remedies).
8. Circumstances that may invalidate legal transactions

The last topic for contract law discusses different situations in which contracts can be defaulted. These are duress, undue influence, mistake, unconscionable dealing, and illegality.

<u>Other topics</u>

9. Consumer Law

   This topic addresses the need for consumer protection law (Australian Consumer Law) in the event of misleading conduct, unconscionable conduct, unfair contract terms, consumer guarantees, unfair business practices, and unsolicited consumer agreements.

10. Tort Law

    This topic explores tort law which concerned with wrongful conduct by one person that causes harm to another. In Principles of business law, we explore only tort of negligence in detail. This involves learning elements to establish negligence, and remedies if negligence had been deemed existent.

11. Agency Law (not examinable)

Lectures

Tania and Arlen broke down the weekly lectures into shorter videos covering each sub-topic. The number of videos will vary depending on the number of sub-topics. These shorter videos allow greater flexibility and are easier to comprehend. At the end of every topic, there is a case study video that covers a hypothetical situation. In this case study, I was able to see how different concepts are applied. In addition, the format of the case studies, as well as different cases presented in the
lectures, is like the short answer questions in the exam.

Tutorials

A sample paper will be released before every test in B-law. The workshops involve discussing questions from this sample paper. Personally, I did not attend any of the workshops as recordings of the workshops were released online. These recordings separated different questions by topics.

I suggest attempting the sample papers first to see which areas you need to improve or read more on. As the recordings were lengthy in nature, I suggest reviewing questions/topics that you are unsure of only.

Assessment

Online Quizzes
There were two online multiple-choice quizzes consisting of 40 questions each. These open-book tests have a 3-day window but must be completed in an hour in one sitting.

The first test covers topics 1-3 and the second test covers topics 4-8. One of the study methods that was very useful for me was to make summary notes before every test. These summary notes include everything in the lecture slides, key points mentioned in the lecture recordings, as well as supplementary notes from the textbook. These will be very helpful as you have control F on your laptop which enables you to search for key points/topics with ease.

Final Exam
The end-of-semester exam is usually held in the third week of examinations. The format of the exam is 40 multiple choice questions (60 marks, worth 1.5 each) and short-answer questions (20 marks, new exam format in 2022). The time frame of the examination is 90 minutes.

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Like the multiple-choice quizzes, there is only one sample practice paper made available. However, you can search for past sample papers online which I found to be very good practice. Again, I would like to emphasize that summary notes (covering all chapters) are your best friend during the exam! Be mindful of the time when completing the exam as short
answer questions might be time-consuming. I suggest aiming to complete the short answer questions in 30 minutes but complete the multiple-choice questions first as they are worth more marks.

If you are worried about not having enough time to read the textbook, worry not as many of the questions tested us on the understanding of the content itself, instead of our knowledge of the textbook. Personally, I only read chapters that I was least confident in.

COMP10001 Foundations of Computing [SM2]

Lecturer(s)	Dr Kat Vylomova
	Prof Chris Leckie
Weekly contact hours	3 x 1-hour lectures
	1 x 2-hour tutorial
Assessments	Grok Worksheets 10%
	Mid-Semester Exam 10%
	2 x Grok Projects 30%
	Final Exam 50%
Textbook Recommendation	None
Lecture Capture	Full (both audio and video)
Year and Semester Reviewed	2023 Semester 2

Comments

Foundations of Computing is a python-based introduction to programming. It introduces all the fundamental topics of coding including structuring programs, algorithmic thinking, problem solving, debugging, and an introduction to website integration.

It is an incredibly valuable resource for students that may be a little rusty coding or for students that have never programmed in their life. Being able to code, even just at a foundational level, is of course extremely useful / applicable for many areas including actuarial science, a large reason for why I picked the subject as an elective. It was also a very enjoyable subject, and the problem-solving skills that are applied and learned in the semester were to me extremely rewarding.

Overall, if you have a strong basis in problem solving and algorithmic thinking and potentially some experience programming (although this is not completely necessary), this subject can be considered a WAM booster, but if not, thoroughly working through the worksheets and doing a few practice exams (the format is largely the same every year) will help to ensure a good mark in the class. It may also be helpful to try and code a program useful to you in python as the ingenuity required to do so within your own constraints can really extend your grasp on the programming language. I used python to write a simple script for my family's Kris Kringle and it is the single best revision for the subject I did, so I recommend finding something that can be applicable to you and attempt to code it.

Subject Content

(From the grok worksheets)
1. **Building blocks**

    A scratch-based introduction to how coding is approached.
2. **Introductory exercises**

    The print, input, and if-else functions
3. **Numerical expressions**

    Dealing with basic arithmetic in python
4. **Sequences**

Lists, f-strings, and indexing

5. **Functions**

   How to define a custom function

6. **Iteration**

   For and while loops

7. **Mutability**

   What does it mean for something to be mutable and what data types are and aren't mutable?

8. **Readability**

   An introduction to python's style guide; PEP8

9. **Dictionaries**

   Keeping track of data with dictionaries

10. **Libraries**

    Using basic python libraries (itertools and collections)

11. **IO and CSV files**

    Opening, reading, and writing files in python

12. **Comprehension**

    A way to compact functional code using list and dictionary comprehension (very useful)

13. **Exception handling**

    How to deal with python errors in an elegant and user-friendly way

14. **Recursion**

    An advanced algorithmic technique called recursion

15. **Basic HTML**

    An introduction to a scripting language for publishing information on the internet, and integration for this with python

16. **Additional topics**

    Change semester to semester but are covered in the <u>last week of lectures</u> **(the last 3 questions on the exam always relate to these)**

Lectures

3, 1-hour weekly lectures are presented and recorded, going through all the covered topics in a similar progression to the Grok worksheets. These two formats of learning to code in Python are practically identical, and although potentially helpful, I found myself only going to the first and last week of lectures and learning all the content from the compulsory worksheets. The lectures may be useful however if the Both of the lecturers are however very nice and very good at explaining the concepts, so I would recommend working through the Grok worksheets one week ahead, and if any clarification is required, the lectures for that week may be useful attending.

Tutorials

Another great way to receive clarification on the topics are the tutorials. They run once a week for 2 hours, the first hour involves the tutor recapping what was taught in the lectures for that week with helpful example problems, and the second hour is supervised time to work on your Grok worksheets / projects and get any help that is required from the tutor. I recommended to go to the tutorials when the projects are introduced as the tutors give helpful tips to be successful in these, and just like the lectures, to potentially clarify any topics introduced in the worksheets for the upcoming week.

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Assessment

The grok worksheets are practically free marks with any necessary help from the tutors, as all is needed from them is to read through them and learn the concepts, and to apply them to practice problems in which you have infinite attempts to get a correct solution. The tutors are happy to provide any help for solutions if you are stuck on any questions. Furthermore, only 75% of the worksheets are required to receive full marks, so if you are really stuck on any problems, you may not have to complete them, although they are certainly the best practice for learning the concepts, and working through as much as possible on the worksheets is strongly advised.

The mid-semester test is a 45-minute written exam on concepts that have been learnt from the worksheets thus far. It is typically easy as the topics covered up to that point are still fairly introductory.

There are two projects due towards the end of the semester that are worked through in multiple steps to explore some random topic chosen by the lecturers and ultimately achieve some algorithm to complete a task regarding the chosen topic. In my semester, the first topic was about flow rates of water systems, and how programming can aid in various applications for this. You are given around 2 weeks to complete these projects but with a thorough understanding of the topics covered in the worksheets, they can usually be knocked out in a few days. It is recommended to start on them early, as you will not get everything right the first time, and giving as much room to step away and come back to it with different potential solutions is key to nailing these projects. The criterion for assessment is well addressed within the projects themselves, simply follow the rubric after getting a correct solution to achieve maximal marks (commenting correctly, adhering to the style guide, etc.)

The final exam is around the same difficulty as the mid-sem, but with additional topics covered in the second half of the semester which are typically more difficult by default (i.e. the basics of recursion and io files are harder than the basics of the print function). Emphasis in my opinion should be placed on making sure you understand everything from the worksheets, as well as the additional topics from the last week of lectures (make sure not to forget about this as it is not in the worksheets), as if this is achieved the exam is typically easy. The hardest topic in my opinion is remembering the specifics for the used libraries (i.e. syntax).

COMP10001 Foundations of Computing [SM1]

Lecturer(s)	Chris Ewin Alistair Moffat Alex Zable
Weekly contact hours	3 × 1-hour lectures (in some weeks, one lecture is an advanced lecture so doesn't cover new content) 1 × 2-hour tutorial/workshop
Assessments	Coding Projects on Grok 2 x 15% = 30% Mid-semester test. 10% Grok worksheets (coursework) 10%. Final exam 50% Hurdle Requirements **Combined** mark for the projects and worksheets needs to be at least 20/40 **Combined** mark for the mid-semester test and final exam needs to be at least 30/60
Textbook Recommendation	There is no textbook, as all the learning materials contained within the "Grok worksheets" and lecture slides, and any content taught outside of Grok will be covered in the lecture slides.)
Lecture Capture	Full (both audio and video)
Year and Semester Reviewed	2023 Semester 1

Subject Content

Week 1:
- Welcome and subject overview
- Introduction to Computing and Grok
- Programming basics

Week 2:
- Python basics and types
- Variables and strings
- Conditionals and sequences

Week 3:
- Conditionals and functions
- Methods, comments, and tuples

Week 4:
- Iteration
- Lists and dictionaries

Week 5:
- Dictionaries, sets, and advanced functions

Week 6:
- Project 1 Overview

Week 7:
- Mid-semester test (No Lecture)

Week 8:

- Code style and readability; debugging

- Debugging; libraries; MST feedback
- File IO and comprehensions

Week 9:

- CSV files; iterators
- Exception handling

Week 10:

- Recursion
- Algorithms

Week 11:

- Computational counting
- Fairness and ethics, HTML

In this subject, you learn how design and write small programs using a high-level procedural programming language, and to solve simple problems using these skills.

Topics covered include fundamental programming constructs; fundamental data structures; abstraction; basic program structures; algorithmic problem solving, testing, and debugging; introduction to the Web, multimedia, and visualisation.

There is very heavy emphasis on the practice of coding. You do not get too caught up in the theory behind coding, but knowing the theory is quite important, because (you'll see) that you need to accurately handwrite code to score well in the subject!

Throughout the subject, you learn how to:
- Use the fundamental programming constructs (sequence, alternation, selection)
- Use the fundamental data structures (arrays, records, lists, associative arrays)
- Use abstraction constructs such as functions.
- Understand and employ some basic program structures.
- Understand and employ some basic algorithmic problem-solving techniques.
- Read, write, and debug simple, small programs.

Lectures and Grok Worksheets

In the initial weeks, the lectures covered elementary topics, which I found quite foundational. I discovered that pairing the lectures with the practical coding exercises on Grok significantly enhanced my understanding, far more than attending the lectures live or viewing them in isolation. As the course progressed, the material naturally became more complex, making active engagement with the lectures increasingly beneficial. The online and recorded lectures were delivered with exceptional clarity and were quite engaging. With the option to choose from three different lecturers in the recordings, I was able to select the one whose teaching style resonated most with me. I would advise against overlooking the lectures, particularly when preparing for the midsemester and final examinations. There are nuanced details discussed in the lectures that are crucial for the exams and might be missed if one were to solely focus on completing the worksheets.

The Grok Worksheets are the bread and butter of the subject and essentially condense the lecture material into small sections that are a great help for revision. They also include several questions that offer quality practice for the students, due weekly and contributing to 10% of the subject's overall grade. A few individual

worksheets in the latter half of the semester are non-compulsory and offer 'bonus marks' that can make up for marks students may lose in other sections of the subject.

Tutorials

Reflecting on the tutorials for the subject, my attendance was unfortunately limited to the very first session, so I cannot offer extensive insights into their overall value. However, I did find the tutorial worksheets to be quite beneficial—they effectively gauged my theoretical grasp of the material and served as excellent revision tools. While I didn't experience it firsthand, I can surmise that the feedback from tutors would be immensely valuable, particularly for those finding the Grok worksheets or projects challenging. In hindsight, I do regret not taking advantage of the tutorials, especially considering my poor performance on the midsemester exam. Despite this, I managed to achieve an H1 in the final assessment, which suggests that while tutorials can be incredibly helpful, particularly in understanding complex concepts and preparation for exams, they may not be utterly indispensable for everyone, depending on their personal study efficacy and grasp of the subject matter.

Assessment

Assignments (Projects)

Project 1 contained 3 questions while Project 2 contained 5. All questions were much more advanced than those in the Grok Worksheets. Myself and other very high-achieving students may sometimes spend several days trying to crack one of them, so it's certainly not something to be left till the last minute! It needs not only patience, but a bit of creativity as well. I would suggest planning out the solutions for each question in simple words before translating it into code.

Mid-semester Exam

The mid semester exam was 1 hour long and ran in person in a lecture hall. The question types were quite different to the assignments and worksheets, and like that of the final exam and on the tutorial sheets. The practice sample exam provided was excellent study material and gives an accurate representation of what the real thing looks like. I recommend practicing how to produce and interpret code under stringent time conditions, and of course being familiar with the content prior to reading CSV files. Please try to handwrite some code and play around with some niche applications of the different operations on the various containers (strings, tuples, lists etc.) because that is the main content assessed on the midsemester exam.

End-of-semester Exam

The 3-hour final exam was worth 50% and contained 8-9 questions for a total of 100 marks. The style was like the mid semester exam, in fact many questions were of the same type. It was obviously much longer than the mid-sem and it contained some questions lying in the same context as your projects, with slightly different solutions. Personally, I found the timing to be quite tough and the overall difficulty to be higher. This was not necessarily due to the questions themselves being harder, but rather that the later topics in the second half of the semester elevated the difficulty. I would recommend the same revision technique as the mid semester test. The practice pre-covid handwritten exams were very useful tools for revision!
 Remember you need a combined 30 out of 60% across the two exams as a hurdle!

COMP10002 Foundations of Algorithms [SM2]

Lecturer(s)	Prof Alistair Moffat
	Dr Artem Polyvyanyy
Weekly contact hours	3 × 1-hour lecture
	1 × 2-hour tutorial
Assessments	3 x Online Quizzes 30%
	Individual Assignment 1 20%
	Individual Assignment 2 20%
	Final Exam 30%
Textbook Recommendation	Moffat, A, 2012, Programming, Problem Solving, and Abstraction with C, Revised Edition, Pearson
	✓ **Recommended**. Especially as a useful revision material closer to the exam period. It is an extension of the lecture slides as most of the content in the lecture slides come from the textbook, which covers the concepts taught in more details.
Lecture Capture	Full (both audio and video)
Year and Semester Reviewed	2020 Semester 2

Comments

COMP10002 Foundations of Algorithms (FoA) is a continuation from COMP10001 Foundations of Computing (FoC). It is a prerequisite for most of the second and third-year computing subjects and uses the programming language C. Students are encouraged to download a compiler and code editor early in the semester to familiarise themselves with the programming environment on their laptops.

An important thing to note is that due to the structure of the Bachelor of Commerce, students can only take a maximum of 125 points of Level 1 subjects. Therefore, unless you plan to enrol in the Diploma in Computing, you would need to replace ACTL10001 with COMP10001 to achieve the prerequisites for this subject (unless you can enrol with the programming competency pathway).

Overall, I found COMP10002 challenging yet fun. It has enabled me to learn and think about the different approaches and algorithms when solving a problem. Although it took me some time to get used to not coding on Grok, I soon appreciated the accessibility of programming using a code editor and compiler.

This subject is only available for students who are completing the Diploma of Computing or able to achieve the programming competency prerequisite.

Subject Content

1. Introduction to Algorithms; Introduction to C Programming
2. Selection, Iteration and Abstraction in C
   Introduces the precedence of operators in C programming, the different types of loops and functions.
3. Functions and Pointers
   Discusses how we can call and pass variables into a function.
4. Arrays and Algorithms

Introduces arrays and pointer variables.

5. Analysis of Algorithms
   Discusses the efficiency of algorithms using the Big O notation. Introduces the algorithms and efficiency behind binary search and quicksort.
6. Strings and Pattern Search Algorithms
   Introduces the different string and pattern search algorithms such as sequential pattern search, KMP search and BMH search.
7. String Search Algorithms (cont.) and Indexing Data Structures
   Continuation from Week 6's lectures. Introduces indexing and suffix array construction.
8. Structs, Dynamic Memory and Linked Data Structures
   Delves deeper into the usage of pointers and introduces the concept of dynamically allocating memory that is sized according to run-time values. This is personally the most challenging topic in the subject as I find the extensive use of pointers very complex.
9. Linked Data Structures (cont.), Binary Search Trees, Function Arguments, Modules
10. Files, Number Representations
    Introduces different file operations, such as writing, reading, and appending.
11. Number Representations (cont.), Problem Solving Techniques
    Discusses the different types of number representations, such as binary numbers with their integer and floating-point representations.
12. Dictionary and Priority Queue Structures; Hashing; Mergesort and Heapsort
    Introduces more sorting algorithms that have time complexity of O(nlogn).

Lectures

Alistair and Artem took turns delivering the lectures. Both lecturers were very passionate, and I often found the lectures interesting since they discuss many sample programs introduced in the textbook. Besides just showing the code and how it runs, sometimes the lecturers would prepare an excel spreadsheet to go through how the program or algorithm works step by step, which helped me visualise the concept better.

One key thing to note is that the lecture slides only covered the basics and do not include many details. Therefore, Alistair always stressed the importance of reading the textbook to get a better understanding. I personally annotate my lecture slides as I go through the lecture captures and only read a few chapters on the topics that I found challenging closer towards the exams.

Tutorials

In the weekly 2-hour online workshops, tutors usually went through the allocated exercises that week and recap contents that were covered in the previous week during the first hour. My tutor broke us out into breakout rooms to come up with solutions for some of the questions before discussing together in the main room. Although there were no tutorial recordings, pre-workshop videos that covered the overview of some concepts and some Grok exercises are posted up at the beginning of each week. Videos going through the solution to the Grok exercises were also made available at the end of the week.

In the second half of the workshop, students were given time to work on their own codes. If you encounter a problem, you could always use the "tutoring help" function on Grok or "raise hand" on Zoom to ask for help. I personally found it very helpful to attend workshops since we were given a chance to discuss the concepts with other students, which helps to solidify our understanding.

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Assessment

Online quizzes

There were three online quizzes this semester, each of them contributed 10% to the final marks and was 30 minutes long within a 45-minute time window, taken via the LMS. The quizzes are closed book assessments, and without any use of gcc/Grok permitted. Each quiz included five multiple-choice content question and one function writing question. If students keep themselves up to date with the lectures, the quizzes will not be too challenging.

Assignments

There were two individual assignments, each contributing 20% to the final marks. Each assignment was broken down into three stages, which guided us to progressively develop a full program. The stages were usually dependent on each other, so it was encouraged to tackle them step by step. We had two and a half weeks to complete each assignment. The first assignment tested our knowledge on functions, sorting and displaying data. Whereas the second assignment tested us on utilising dynamic memory allocation, pointers, and linked lists. 136 Both assignments required us to combine the concepts and techniques learned during the lectures and were challenging yet very stimulating. Marks were allocated based on the program presentation, execution and structure, and approach of the code. By putting in enough effort and starting early, it is very doable to achieve high marks for both the assignments.

End-of-semester exam

In the final exam, students were given an hour writing time with 15 minutes of reading time. Although no past exam papers were provided due to the different exam format this year, a practice exam which highly resembles the final exam was provided in the first week of exams. The exam was separated into three sections: short answer, programming, and algorithms. Each of the section contributed 10 marks to the final exam. The exam was heavily focused on the latter parts of the subject content, covering trees, pointers, and algorithms. These topics were barely included in the quiz and hence students might tend to overlook. Therefore, I would advise students to go through these topics in more detail to familiarise themselves with the concepts.

BUSA20001 Visualisation and Data Wrangling [SM2]

Lecturer(s)	Mr Derick Lyle
Weekly contact hours	1 × 1-hour lecture 1 × 2-hour workshop
Assessments	Individual Assignment 20% 2 x Group Assignment 40% Final Exam 40%
Textbook Recommendation	None
Lecture Capture	Full (both audio and video)
Year and Semester Reviewed	2023 Semester 2

Subject Content

1. **Topic 1 – Data and Decisions**
   Discusses organisations' purpose and intent of using data, different analytics levels, and some real-world examples.
2. **Topic 2 – Structured Data**
   Covers relational databases, beginner and intermediate SQL, and everything about Entity-Relationship Diagrams.
3. **Topic 3 – Data Visualisation**
   Teaches Tableau as a tool for data visualisation, dashboard creation & layout, and publishing reports.
4. **Topic 4 – Scripting and Automation**
   Focuses on applying the pandas package in Python, in combination with SQL and Tableau, to more complex techniques in data wrangling.

The content focuses on the different tools a data analyst can use to draw actionable insights for non-technical stakeholders, and teaches students from scratch, the fundamental technical skills necessary for this. All 3 tools used in the subject: SQL, Python, Tableau, are highly relevant in the real world, with many exercises and all assignments accurately reflecting the type of problems that can be solved using data.

Lectures

The weekly 1-hour lectures are recorded and uploaded to LMS, providing introduction and explanation to the same concepts that will be covered more deeply in the workshop of the following week. Certain lectures teaching the conventions and notations of Entity-Relationship Diagrams, syntax of SQL, and functions in Python are quite useful, but most of the times the lecture can realistically be skipped, as most content is taught in the workshops.

Workshops

The weekly 2-hour workshops are not recorded, and they contain exercises that encapsulate most of what is required for the assignments and final exam. Even though I have gotten exposure to SQL and Python through Database Systems and Foundations of Computing respectively, I still found some of the exercises quite

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challenging, which shows how steep the learning curve can be. Attendance is not technically required, but highly recommended even if you are just trying to scrape a pass.

Assessment

Individual Assignment:
The individual assignment was a series of SQL and Entity-Relationship Diagram questions mainly based on a single database from a case study. It involved both interpretation and writing of SQL code, which has a highly unique syntax that takes a while to get accustomed to. Some questions were quite difficult and huge time sinks, which also enabled me to realise early on, that I should make use of consultation times in this subject.

Group Assignment 1:
This was an easier assignment focused on creating a two-page dashboard and report using Tableau. The task sheet contained various and occasionally vague instructions aimed to replicate a typical client's business requirements in the real world. This gave students a lot of freedom but also brought confusion, which necessitated clarification from the subject coordinator. Overall, Tableau is much easier to pick up than Python or SQL, making this the most doable assessment of the subject.

Group Assignment 2:
This was the most difficult and time-consuming assessment of the subject. It too involved dashboarding with Tableau, however one of the desired visualisations can only be produced with extra data wrangling and manipulation of the database using both SQL and Python. A 5-minute recorded presentation was also required, which involved non-technical explanations of each visualisation and the business value they delivered.

End of Semester Exam
The 2-hour on-campus digital exam allowed 1 double-sided A4 sheet of free notes. It did not require any code to be written, and contained questions ranging from interpreting ERDs, SQL and Python code, to long discussion questions which asked us to evaluate the strengths and shortcomings of different dashboards presented. Most aspects of the exam could be reliably prepared for using the workshop exercises and exam-prep material given. The most difficult thing to prepare for was the section on interpretating an extended chunk of Python code. Here is where it is important to make use of the 1-page cheat sheet, as I filled most of mine with Python syntax and functions.

Overall Remarks

This is a very hands-on subject with by far the highest real-world applicability out of every subject I have completed. It does not assume prior knowledge in any of the 3 technical tools used (SQL, Python, Tableau), although the learning curve is very steep at times, and programming experience would be advantageous. Although the assignments do not contain the hardcore mathematics found in other subjects, they are purposely designed to be extremely time consuming and practically undoable without guidance. However, the Course Coordinator goes above and beyond, and offers extensive availability for consultations to clarify any student's queries. The subject requires a large time investment, and it may still well be a WAM killer, but it will equip one with job-ready skills practical in any data-related field.

FNCE20005 Corporate Financial Decision Making [SM1]

Lecturer(s)	Dr Chander Shekhar
Weekly contact hours	1 × 2-hour lecture 1 × 1-hour tutorial
Assessments	Individual Assignment 15% Mid-Semester Exam 25% Final Exam 60%
Textbook Recommendation	Readings given on LMS ✗ **Not recommended**. These are mostly optional and not necessary to do well in the subject
Lecture Capture	Full (both audio and video)
Year and Semester Reviewed	2022 Semester 1

Comments

Overall, Corporate Financial Decision Making (CFDM) is easy to understand and do well in as long as you attend/watch the lecturers and attend the tutorials. The lecturer in Sem 1, 2022 was Chander Shekhar, and he was very good at teaching the subject: explained all concepts clearly, used lots of real-life examples to make the theories straightforward. Would recommend attempting the weekly tutorial worksheets as well since they are not very time-consuming but are useful in grasping a better understanding and application of the theories/formulas introduced. There is never easy H1 but if you do everything prescribed in the subject you should be on your way to an H1 for CFDM.

I would recommend taking CFDM if you can, as it is a WAM booster (final grade scaled up by 12 points) but also an interesting one. You get a more holistic understanding of the financial world from this subject as a step up from Principles of Finance (PoF). The type of content introduced in the subject is fairly like PoF but more applicable, including things such as real options, IPOs, corporate distress, and basic valuation methods.

Principles of Finance is a prerequisite.

Subject Content
1. Raising capital: Equity
2. Payout Policy
3. Debt and Leases
4. Issues with WACC and Capital Structure Policy
5. Advanced Topics in Capital Budgeting: Sensitivity, Break-Even and Decision Tree Analyses
6. Advanced topics in Capital Budgeting: Real options
7. Analysis of Takeovers: Part I
8. Analysis of Takeovers: Part II
9. Corporate restructuring
10. Corporate distress
11. Risk Management

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Assessment

Assignments

Individual Assignment is an MCQ test consisting of 9 questions (mostly calculation based), and you are given 5 days to complete it. The questions are challenging, but it is not extremely difficult to get full marks on that 15% if you start early (allocate at least one to two full days to it, since each question takes a fair bit of time to figure out and you want to make sure you are not rushing your calculations to avoid silly mistakes).

Mid-semester test

MST in comparison is more time constrained. It is also an MCQ test but includes more theory-based questions than calculations. It can be quite a hit-or-miss as MCQ can be tricky but making sure you have a solid understanding of the first 4 weeks of content should put you in a decent position.

End-of-semester exam

Final exam is 2 hours + 15 minutes reading time + 30 minutes submission time, and most people should have experience with the submission software Gradescope from PoF, so most of us would realistically only require 5 minutes to submit. Therefore, it is essentially a 2-hour 40 minutes exam. However, it is a relatively long exam with lots of written answers that could be time-consuming, so make sure you have a good time allocation plan before heading into the exam.

FNCE20005 Corporate Financial Decision Making [SM1]

Lecturer(s)	Dr Chander Shekhar
Weekly contact hours	1 × 2-hour lecture 1 × 1-hour tutorial
Assessments	Individual Assignment 15% Mid-Semester Exam 25% Final Exam 60%
Textbook Recommendation	Peirson, G, Brown, R, Easton, S, Howard, P & Pinder, S, 2015, Business Finance, 12th edn, McGraw-Hill ✗ **Not recommended**. I do not believe the textbook is necessary
Lecture Capture	Full (both audio and video)
Year and Semester Reviewed	2020 Semester 1

Comments

Overall, I enjoyed this subject very much given its grounding in real-life and focus on decision making (hence the name I suppose). The content was stimulating and easy to absorb if you have an interest in the world of finance. Some of the concepts Chander touched on were initially counter-intuitive or perplexing, however one could often get to the bottom of this by reflecting on lessons taught in PoF or even accounting subjects such as ARA or Introductory Financial Accounting. Finally, Chander always includes additional resources and articles about the covered content. While these are not examinable, they do allow you to make some interesting connections between the content and deals you see in the media.

I would definitely recommend this if you are interested in developing a more holistic understanding into the world of finance!

This subject is a required prerequisite for the two core FNCE subjects (Investments and Derivative Securities) to double major in Finance with Actuarial Studies.

Subject Content

1. **Introduction and Options**
   This section offers a deeper look into options. It is a useful refresher and lays the foundation for future topics in Real Options and Risk Management. It is important to understand the hedging benefits of options, how certain phenomena influence pricing and the relevant payoffs to different stakeholders.
2. **Raising capital: Equity This topic offered a comprehensive overview into equity raisings and was quite** content driven, describing the motivations for different approaches. While Chander includes a lot of empirical research here, the main study to prioritise concerns of and rationale behind under-pricing.
3. **Debt and Leases This topic provided an insight into why firms may decide to lease assets instead of** purchasing them outright, and how to evaluate this decision via incremental NPV analysis. Ensure you have a clear understanding as to how incremental value is derived by the lessor and lessee.
4. **Payout Policy**

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This section investigates a more realistic look into how firms decide to utilise excess cash rather than the Modigliani and Miller (M-M) propositions covered in PoF. Whilst M-M is introduced as a base case, you learn about how firms can look to reward shareholders and implications of these strategies for different parties. Ensure you understand the process of a share buyback, notably the impacts that the imputation system has on this and the motivations for choosing between stock buybacks, dividends, and reinvestment.

5. **Issues with WACC and Capital Structure Policy**
This topic introduces a suite of different theories that offer insight into the debt-equity make up of a firm. In addition to WACC learnt in first year subjects, you must pay extra attention to the influence of taxes and the need to lever beta, allowing the relative risk measure to account for the firm's financial risk. The main point to understand in this topic is the trade-off between using debt (tax benefits, lower cost but higher financial risk) and equity (expensive to issue, higher returns expected no tax benefits but minimal financial risk)

6. **Advanced Topics in Capital Budgeting: Sensitivity, Break-Even and Decision Trees Sensitivity**
Analysis is simply NPV analysis but changing one variable at a time based on different sentiments and viewing the consequences of doing so. Break-even analysis, as the name suggests, involves letting NPV equal 0 and noting how much a certain variable would have to change for this to occur. Finally, decision trees allow you to map out potential decisions you will encounter and calculate the benefits of pursuing the best pathway.

7. **Advanced topics in Capital Budgeting: Real options**
This is a direct continuation of decision trees, however incorporating a sense of optionality in making decisions: you do not have to fully go through with a project if it is initially unsuccessful. Value is therefore derived from being able to make this decision in the future.

8. **Analysis of Takeovers: Part I**
This topic is a comprehensive introduction to the types of mergers & acquisitions and techniques to value targets. The valuation methods are intrinsic valuation (discounted cash flow models), relative valuations (multiples and comparable methods), contingent claim valuation (viewing the takeover as a real option). Make sure you understand the economic rationales of performing a takeover, namely the synergistical benefits.

9. **Analysis of Takeovers: Part II**
This topic continues from the previous lecture and offers a greater insight into how companies fund such ventures. It is imperative to understand the differences between cash and scrip bids and the incentives behind each. There is also an introduction to governance and regulation. This gives an insight into the hurdles encountered through the engagement process and how different engagements can look from a legal standpoint.

10. **Corporate restructuring**
This topic ran through the reorganisation of businesses that make them more profitable. The most important thing is to understand the different types of business (divestitures, spin-offs & equity carve outs) and financial restructurings (management buyouts, leveraged buyouts and debt restructuring). A good way to remember these is by drawing diagrams outlining the old and new structures of the business after undergoing restructuring.

11. **Risk Management**
Risk management offered a brief look into how firms manage uncertainty. The main thing here is to understand that risk is not a bad thing, it is how firms become profitable. However, risk should be controlled in a manner that limits downside losses without inhibiting upside gain. Techniques covered include hedging through derivatives and Value at Risk measures.

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Lectures

Chander creates quite comprehensive slides. However, it is important you have your own set of not es that cover the main ideas he brings up, as these slides are quite dense. You will quickly notice that he places a great emphasis on understanding the motivation and incentives of alternatives, so ensure you have these noted. He will often include what he terms "dubious reasons", which are points that may seem valid on surface level but are not supported in theory or in practice. It is important that you flag these and understand the rationale behind them as they are often embedded into multiple-choice or true/false questions on assessments. Chander also puts a set of general questions at the end of each lecture. Ensure you have an idea of how to answer each of these as they act as a good method of revision.

Tutorials

The tutorial structure is very similar to PoF in that one half of it is to be completed prior to and submitted at the start of class. Each tutorial worksheet you submit that is deemed to be a "reasonable effort" will equate to 2%, which contributes to a maximum of 10% of your final mark. This means you only must submit 5 in total to secure full tutorial marks.

The tutorials themselves are useful as a foundation, however, do not rely on them to prepare you for the exam as they are generally quite basic. There are often points of discussion or evaluation which can be quite useful for consolidating and justifying your understanding. This is particularly important in the 'true or false' portion of the final exam.

Assessment

Mid-semester test
Multiple-choice out of 20 marks. Most questions will have a "none of above" or "more than one of above option", hence it is imperative that you understand the content as it will not be enough to simply take educated guesses. The weighting is generally spread equally across all the covered lectures, so ensure you are comfortable with each of the topic areas.

End-of-semester exam
Part A (40%):
This section included 10 multiple choice questions worth 4 marks each. This section was particularly brutal as you either received 4 marks or 0 marks. For each question, you need to have chosen true or false correctly and accurately justified it. They also provided a rough limit of 200 words in your justifications, so try and be succinct in your responses. The content relates to every topic and sometimes requires calculations, so ensure you understand each topic's relevant formulas.

Part B (60%):
This section involved 7 questions with varying marks. While it may be tempting to be extremely pernickety in section A, it is important that you move onto this section quickly as a lot these are time consuming. A lot of fiddly calculations means you must be confident on your calculator and ensure you do not combine too many steps.

We only had one practice exam offered to us, and it was significantly simpler than the final. Other past exams can be found through the library or StuDocu. As mentioned, the tutorials are not sufficient to prepare for the final exam, as they are quite short and basic. I would encourage you to use online resources in addition to your reflections, such as Investopedia and the Corporate Finance Institute to explore the intuition of topics further.

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FNCE30001 Investments [SM1]

Lecturer(s)	A/Prof Antonio Gargano
Weekly contact hours	1 × 2-hour lecture 1 × 1-hour tutorial
Assessments	Tutorial Participation Quizzes 10% Mid-Semester Exam 20% Final Exam 70%
Textbook Recommendation	None
Lecture Capture	Full (both audio and video)
Year and Semester Reviewed	2020 Semester 1

Comments

Overall, Investments is an enjoyable subject to learn if you would like to pursue a major in Finance. Compared to the other level 3 subjects in Actuarial, this will feel somewhat like a breeze, and helps you to build some confidence while you're struggling with all the formula manipulations in Actuarial Modelling. However, I did sometimes find the terminologies used in Investments confusing, as there can be many different terms that correspond to the exact same idea. According to this, I would recommend reading more financial news to make yourself comfortable with these expressions.

Subject Content

Topic 1: Security Market
1. Capital Allocation
   Allocating wealth between a risky portfolio and a risk-free asset with mean-variance utility function and capital allocation line.
2. Asset Allocation
   Solution of the best portfolio with two risky assets with concepts like: Opportunity Set of risky assets and Minimum Variance Portfolio.
3. Security Selection
   Markowitz approach to solve the optimal portfolio with many risky assets
4. The Capital Asset Pricing Model
   Estimating the expected return of a portfolio under CAPM
5. Multifactor models, Arbitrage Pricing Theory (APT) and Factor Investing
   Estimating the expected return using multifactor models under the APT

Topic 2: Fixed Income Market
6. Intro to Fixed Income and Zero-Coupon Bond
   Introducing features of the fixed income market and a review of zero-coupon bond, which was covered in Corporate Financial Decision Making.
7. Bond Pricing
   Price coupon bonds using its yield to maturity and varying interest rates and an in-depth look at the price evolution.
8. Yield Curve
   Introducing three theories that explain the shape of the yield curve and the trading strategies in practice.

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9. Managing Bond Portfolios
Overview of the risks in managing bonds and the measuring of the sensitivity to interest rate-risk with duration.

Lectures

Antonio claimed that he's the only one who would teach Investments "in this way" at a bachelor level; he always started each lecture with a real-world problem. For example, we would take a problem, "your boss expects the interest rates to decrease and asks you to implement a strategy that profits from this expectation" and try to solve it using the concepts learned throughout the lecture, so "you wouldn't look stupid on the first day of your internship". 145 Excluding the theory and pure application of formulas, Antonio spent a great amount of time in his lectures to link the topics to real-world practices, which I found it very helpful to get the intuition behind the theory and improved my financial knowledge. For example, when illustrating the idea of the *liquidity of bonds*, he spent nearly 20 minutes manipulating a brokerage account to demonstrate how to make a transaction in practice.

Tutorials

Compared to the lectures, tutorials are more exam focused. Due to the special situation of this semester, they were all recorded and, therefore, well-structured. The key points of each lecture were summarised systematically and were followed by the corresponding exercises. The tutorial questions themselves are also good practice and can involve some concepts and terminologies which were not mentioned in the lectures. So, even though without the recording, tutorial questions were still valuable materials and I recommended you use them wisely for the exam preparation.

Assessment

Mid-semester test
The mid-semester test was held online and contained 20 multiple-choice questions, to be completed in an hour. It covered the contents from the first four lectures. The questions were not hard but did have a certain level of complexity which required you to fully understand the concepts taught in both lectures and tutorials. If you have sufficient preparation, you will be fine.

End-of-semester exam
The final exam was a 3-hour exam with 15 minutes reading time. There were two sections in the exam: 32 multiple-choice questions and 9 problem solving questions. Most of the problems were straightforward, as Antonio is famous for being generous to give marks (from what I've experienced). So, make sure to catch this chance, prepare well, and boost your WAM.

FNCE30007 Derivative Securities [SM2]

Lecturer(s)	Prof Federico Nadari
Weekly contact hours	1 × 2-hour lecture 1 × 1-hour tutorial
Assessments	Mid-Semester Exam 25% Final Exam 75%
Textbook Recommendation	Hull, C, J, 2016, Fundamentals of Futures and Options Markets, 8th edn, Pearson ✗ **Not recommended**. I do not believe the textbook is necessary
Lecture Capture	Full (both audio and video)
Year and Semester Reviewed	2020 Semester 2

Comments

Overall, I enjoyed Derivative Securities very much given its grounding in real life and rigour (compared to a more content-based subject in CFDM). Once you start to understand the benefits of the products and think like an investor, you begin to appreciate the role of derivatives in the world of finance (even if Warren Buffet is not a fan).

I would recommend this subject if you are interested in developing a more holistic understanding of the world of finance or would like to get into trading shops.

This subject is required for double major in Finance with Actuarial Studies, alongside Investments and an additional Level-3 FNCE subject.

Subject Content

1. **Futures and Forwards**
   In this topic, you are introduced to derivative products in futures and forwards. There is a lot of content covered in this topic. However, the three most important foundational concepts to keep in mind are the different niches between futures and forwards, the different reasons to use such securities (hedging, arbitrage and speculating) and how to construct a portfolio with them. Finally, you are introduced to the pricing of these contracts and given a mountain of formulas, depending on if the asset pays dividends, offers a yield, or has storage costs for example. The most important pillar to understand is the intuition behind why these affect the relative price of the derivatives, as you will be given each of these formulas in the final exam.

2. **Options Introduction**
   The first 30 minutes of this lecture is a nice recap of Principles of Finance Week 12 and CFDM Week 1, however ensuring you understand how different variables influence option prices is integral for proceeding topics (such as volatility, time, interest rates, dividends). You are then introduced to an array of strategies that involve certain positions in options and the underlying asset. Whilst these were easy to access given the assessments were open book, in typical years you will need to know these off the top of your head. A good way to do this is to match the name of the strategy with the pay-off diagram, and then you can understand the strategy if asked (and infer the positions from that too).

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3. **Options Pricing**
    The final section of the course involves introductions of two ways to price options: The Black-Scholes-Merton and Binomial models. Federico does a good job of building up to these through the course and gradually rolling out different layers of the respective model to make their construction quite intuitive. The questions related to this can seem very focused on the number-crunching (quite fiddly calculations). However, you will not do well if you don't understand the rationale behind each step or you will likely incur silly mistakes (again this comes back to the earlier idea of grasping the effect of events on the prices of options).

Lectures

Federico is a great lecturer and spends ample time on all the fundamental ideas. Whilst his slides seem to have been made in the early 2000s, all the information you need is usually on there. Just going through them is not enough, in my opinion, as he offers an incredible amount of value in his explanations. The slides are also filled with examples, and I would recommend pausing the lecture for a while, working through the example in your head before progressing, as these types of questions will undoubtedly arise in tutorials and exams. They also assist in consolidating your overall understanding of the content. Whilst he sometimes goes overtime, it is often a by-product of him spending extra time showing you how the assets work in real life (for example showing you a real exchange or a move that features trading). Whilst you can skip through these quite quickly, keep in mind that these may be tested, so try and at least have the core ideas written down from his explanations.

Tutorials

The tutorial structure is very similar to other finance subjects, with the lecturer going through provided questions. The tutorials themselves are very useful, both to build a foundation and to consolidate understanding, so spend ample time on these. I started off by just attending the tutorials themselves, but there was often too much to go through in the 1 -hour block and I didn't feel as though I was learning the content properly. Given pre-recorded videos of the head tutor were uploaded to Canvas, I ended up trying the questions myself prior and then watching his videos with a friend. Whilst this generally took upwards of two hours, I felt it was incredibly beneficial for understanding and I developed a greater level of appreciation for the content, beyond just brute-forcing calculations.

Assessment

Mid-semester test
The mid-semester test was a multiple-choice quiz out of 16 marks. You are only tested on futures and forwards. Weighting is generally spread equally across all the covered lectures, so ensure you are comfortable with all the sections. These take place during your usual lecture slot, so many people thought it would be a good idea to change the lecture they were enrolled in from Tuesday to Thursday, to get more time to revise. Unfortunately, the difficulty of the Thursday test was significantly harder than that of Tuesday (Median of 7 for Thursday vs 11 for Tuesday) so that backfired for several students. Fortunately, Federico is a reasonable lecturer and scaled the Thursday session up 3 – 4 marks, but this is something to keep in mind.

End-of-semester exam
While the Semester 1 exam had no Futures/Forwards content, about 35% of ours was focused on that. Accordingly, it is essential to listen to what the lecturer announces about the make-up of the exam as can change between semesters. For anyone patrolling Reddit or Unimelb Love Letters, you would have probably seen the stream of complaints after this semester's exam. Derivatives is notorious for having hard exams, but

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what made this one so controversial was the number of difficult questions and lack of marks allocated to the hardest parts. In some ways, I can see why this was done as students can simulate a lot of the processes via excel and then copy it in given it was open book; but equally, it disadvantaged those students that attempted to do it properly. Regardless, scaling is common for this subject (Semester 1's exam was scaled up 14 marks) so the difficulty will likely be balanced out.

FNCE30011 Essentials of Corporate Valuation [SM1]

Lecturer(s)	Prof John Handley
Weekly contact hours	1 x 3-hour lectures
Assessments	Take Home Exam 10% Group Assignment 25% Final Exam 65%
Textbook Recommendation	None
Lecture Capture	Full (both audio and video)
Year and Semester Reviewed	2022 Semester 1

Comments

Essentials of Corporate Valuation is a well-designed subject without too much content and a moderate level of difficulty. At the end of the course, students will have a profound understanding of investment bankers' role in corporate valuation.

Subject Content

In this subject, we examined three approaches in valuing corporations and other business interests including stand-alone projects, joint ventures, and private equity. The subject presents a comprehensive exploration of corporate valuation, addressing cashflow-based and multiples-based methods, among others. Designed to deepen understanding of valuation's role in the economy, it tested us on our ability to assess cash flows, earnings, and discount rates, while considering leverage and flexibility
We touched on theory and practices relating to adjustments for imputation, replication principles, and the nuances of digital economy valuation were highlighted. With many real-world applications and examples, we had the opportunity to critically evaluate and apply diverse valuation techniques in various business contexts.

Lectures

Each lecture is divided into two parts – approximately a 2-hour lecture on lecture materials, a 1-hour collaborative learning exercise, and a 15-minute coffee break in between. John explained the models and relevant concepts in detail, citing relevant quotes from McKinsey, Bloomberg, and other sources. Additionally, John includes optional extension notes after every relevant topic for students who are keen to dig deeper into various topics.

The collaborative learning exercise is more engaging, practical and is usually based on a real-world case. An example is the learning exercise in Class 9 which explores the movie – 'the Social Network.' This exercise explores the dilution of power of Facebook's founding owners during three rounds of shares. Data is extracted from a clip in the movie. Note that the collaborative learning exercise may be tested during the exams. I did not attend lectures in person as I was not able to stay focused for three hours. I discovered that watching recorded lectures was more beneficial as I was able to go at my own pace.

Assessment

Take home exam

The take-home exam has a similar format to a typical assignment in Finance subjects. It consists of two questions – the first being a short answer response whilst the second involves calculation using Excel. Both questions were straightforward and tested your understanding of chapters 1 to 4.

Assignments

This assignment may be undertaken individually or in groups of up to three students. The topic this year explores one of the two biggest social media platforms – Meta Platforms, Inc. (FB) and Twitter, Inc. (TWTR). Using the data given (financial reports and relevant information), we were asked to calculate earnings multiples of the companies and value Twitter using Meta as a sole comparator. In addition, we should also compare our valuation to the offer from Elon Musk to buy Twitter for $54.20 per share.

Overall, this assignment was tedious as there were a lot of areas where you had to use your judgment (e.g., figuring out the surplus assets of each company). However, I found this assignment very practical and rewarding, as not only did I apply techniques of valuation in practice, but I also develop strong research and teamwork skills. This assignment was also relevant to the current trending news of Elon's Twitter takeover which I was able to track in real-time.

End-of-semester exam

The final exam consists of four questions and accesses your understanding from all topics excluding topics 1, 8, and 12. The practice exam and weekly problem sets are useful materials to test your understanding of relevant topics. Since this subject does not have tutorials, students are expected to complete the problem sets at their own pace. It is highly recommended to finish the problem set every week, but I was able to cram and complete the problem sets during SWOTVAC (not recommended, but possible).

John mentioned that there is no proof tested in the final exam. Hence, I skipped any questions that involves proving in the problem sets and practice exams. Questions in the final exam have a similar format to the problem sets. It is highly recommended to do calculations in Excel as you can submit screenshots of your Excel file in the final exam, and this will save you a lot of time. The collaborative learning exercise that involves Facebook was tested in the final exam.

I found the final exam to have a higher difficulty than the practice exam. Two of the questions are more theoretical, and you have to have a deep level of understanding of topics in Class 6 (specifically, Estimating the Risk-Free Rate In A Low Interest Rate Environment), and the theory behind PE ratios in class 7.

ECOM20001 Econometrics 1 [SM2]

Lecturer(s)	Prof Marc Chan
Weekly contact hours	2 × 1-hour lecture 1 × 1-hour tutorial
Assessments	Weekly Online Quizzes 10% 3 x Group Assignments 15% Tutorial attendance and participation 5% Final Exam 70%
Textbook Recommendation	None
Lecture Capture	Full (both audio and video)
Year and Semester Reviewed	2020 Semester 1

Comments

For those who set on the path of Actuarial Studies, 80% of the topics in Econometrics 1 are covered in the core subjects spreading over Probability, Statistics and Actuarial Statistics. Therefore, I would not recommend this as a value-adding subject to choose as a breath or elective regarding the content. However, if you have done all the actuarial subjects but still wanted to maintain your skills in your final year, and are also interested in their econometric applications, you could consider taking this subject. I still found it to be enjoyable and interesting to learn.

Subject Content

1. **Overview of Econometrics**
2. **Probability Review (covered in MAST20004)**
   Random variables, distributions, random sampling
3. **Statistics Review (covered in MAST20005)**
   Hypothesis tests, confidence intervals, sample variance and standard error, scatterplots.
4. **Single Linear Regression Estimation (covered in ACTL30004)**
   Population regression line, ordinary least squares estimator, OLS assumptions, model fit measurement.
5. **Single Linear Regression Hypothesis Testing (covered in ACTL30004)**
   Confidence intervals for coefficient estimates, t-statistic, dummy variables, heteroskedasticity and homoskedasticity.
6. **Multiple Linear Regression Model Estimation**
   Omitted variable bias, population multiple linear regression line, control variables, OLS estimators, measures of model fits, perfect multicollinearity, dummy variable trap, imperfect multicollinearity.
7. **Multiple Linear Regression Model Testing**
   Testing joint hypotheses, F-statistic, single restriction with multiple coefficients, model specification, applications.
8. **Nonlinear Regression**
   General framework of estimating and testing nonlinear regression models, partial effects, polynomial regression functions, logarithmic regression functions, interactions between independent variables, differences-in-differences, and quasi-experiments.
9. **Assessing Studies Based on Multiple Regression**
   External validity, internal validity, and threats to them.
10. **Time Series Regression (covered in ACTL30004)**

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Basic structure of time series data, autocorrelations, autoregressions, basic principles of forecasting, ADL models, AIC, BIC, seasonality.

Lectures

Lectures are well-designed with a logical structure covering all the non-coding content. The lecture notes are ample study material which covers all the knowledge points we need to know. During the lecture, Marc delivers clear and concise explanations of the notes with annotations and highlights of the important parts. He is also very patient when providing online supports and consultations, which make the course enjoyable to learn.

Tutorials

Tutorials are mainly focusing on R programming and the interpretations of the outputs. The handouts are well designed to walk you step-to-step through every line of the code, the economic interpretations of the estimates and the estimation errors. Most of the code should also be covered in Statistics and Actuarial statistics. It is recommended to attend the tutorials if you take this course for two reasons, earning the 5% participation mark and learning the language used in economic interpretations from the tutor's explanation and interaction with other students.

Assessment

Assignments

Assignments are to be done in groups up to three people of which you get to choose. All the assignments are R based and are straightforward. They do not require you to program yourself but require an understanding of the code taught in the tutorials to identify which code should be used in the model provided in the assignment.

End-of-semester exam

Even though you may find the maths, code, and ideas quite familiar, there is some extension to a couple of the previously taught ideas and many details to be aware of. Past exam papers and a practice exam are given, which are useful material for exam preparation. However, you should only expect the actual exam to have a similar format with as these materials, not necessarily the questions, as these can be quite flexible.

The end-of-semester exam was held online this semester in a quiz form. 25 questions (ten multiple choices, three short responses and two comprehensive problem-solving questions with multiple sub-questions under each) were to be done in 3 hours plus 30 reading time. The typing of formulae was a disaster and made the exam an intense experience. It was difficult to finish all the questions in time. Therefore, sufficient preparation is essential to perform well in the final exam.

ECOM30004 Time Series Analysis and Forecasting [SM2]

Lecturer(s)	Prof Vance Martin
Weekly contact hours	1 × 2-hour lecture
	1 × 1-hour tutorial
Assessments	4 x Assignments 40%
	Final Exam 60%
Textbook Recommendation	None
Lecture Capture	Full (both audio and video)
Year and Semester Reviewed	2021 Semester 2

Comments

This subject is one of the most enjoyable courses I did throughout my four-year university study. The contents are easy to understand given our strong mathematical background. If you have studied some basic knowledge in Time Series prior to taking this subject, this would be an insightful while chill subject for you. (i.e., you would not need that much time commitment compared to actuarial subjects).

Overall, this is a good subject to take as an actuarial breadth (particularly for Honours/Master's students) as it is relevant to actuarial studies while not being time-consuming and conceptually difficult like many actuarial subjects.

Subject Content

The contents are well structured into four parts:
1. **Univariate Models**
   - Preliminaries (Week 1)
   - AR (Auto Regression) and Forecasting (Week 2)
   - MA (Moving Average), ARMA and ARMAX (Week 3)
2. **Multivariable Models**
   - VAR (Vector Autoregression), Forecasting and Causality (Week 4)
   - Recursive SVAR (S-Structural) (Week 5)
   - No-recursive SVAR (Week 6)
3. **Nonstationary Models**
   - Unit Roots (Week 7)
   - Cointegration (Week 8)
   - VECM (Vector Error Correction Model) (Week 9)
4. **Volatility Models**
   - GARCH (General Auto Regression Conditional Heteroskedasticity) (Week 10)
   - Forecasting and Extensions (Week 11)

Week 12 is revision.

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Lectures

Personally, lectures are the most important and joyful part of the course. Vance is the funniest lecturer I have ever met. His lectures are always engaging and entertaining. In terms of time commitment per week, I found watching lectures itself is sufficient. My experience is that having a full understanding of lecture material should be the highest priority.

Regarding the structure of lectures, Vance likes to start with some hooks grabbing our attention, so students are likely to be interested in or curious about the course content. Main contents are generally followed by EViews commends and practice questions. (EViews is a statistical package for Windows, used mainly for time-series oriented econometric analysis.)

Tutorials

Tutorials were focused on consolidating concepts taught in lectures and practices using EViews. However, knowing how to use EViews is not required for the final exam which means you should be wise about how much commitment you want to put in regarding tutorial practice. Assignments are where you demonstrate abilities to use EViews to complete tasks. My tutor did conduct lectures reviews in the tutorial which helped a lot for me to refresh what I learnt the week before.

Assessment

Assignments

As you may have noticed, this subject has four assignments throughout the course, which is not common for actuarial students. Difficulty-wise, it should be quite manageable if you keep up with the lecture schedule. I personally did not find tutorials helpful for assignment preparation. One worthwhile thing to mention is the tight timeline of assignment schedules. You may only have a weekend between two assignments, usually no more than one week. Assignments are manageable but achieving full marks is not easy. Summary statistics for the cohort's performance in the assignments were not published. Aiming for relatively high marks in assignments should be considered as a final exam in this subject is more difficult in my opinion and counts more marks for each question.

End-of-semester exam

The final exam consists of three questions with four subsections each. Questions can cover all materials in lectures, tutorials, and assignments. Questions were of different styles, but similar structures compared to assignments. They often require a holistic understanding of concepts of a class of methods/models. Two practice exams were supplied for the final exam. Vance made it available at the start of the semester, which means you can check it out whenever you are ready.

ECON10005 Quantitative Methods 1 [SM1]

Lecturer(s)	Prof David Harris
Weekly contact hours	2 × 1-hour lecture 1 × 1-hour tutorial
Assessments	Weekly Online Quizzes 10% 2 x Online tests 20% Assignment 10% Final Exam 60%
Textbook Recommendation	QME textbook provided by the University. The textbook covers all the concepts taught in QM1 in far greater detail than what is required to score well in the subject. Only refer to this textbook if you are very capable in mathematics and want a deeper level of understanding, otherwise it may do more harm than good
Lecture Capture	Full (both audio and video)
Year and Semester Reviewed	2020 Semester 1

Comments

Quantitative Methods 1 is a subject that can be taken to satisfy the quantitative requirement of the Bachelor of Commerce (*standard pathway*). It teaches the basics and foundations of probability and statistical analysis that is required for future studies in econometrics and finance.

Overall, the subject is reasonable. The lectures are well structured, with each lecture covering a different topic or concept. With regular attendance in tutorials and completion of the online quizzes, most should find it quite manageable. Much of the subject is devoted to the application of the techniques and concepts, rather than conceptual understanding. That said, some of the trickier questions do test your understanding of the content but these only make up a small portion of assessment and tutors are often lenient in marking these types of questions.

Overall, the subject is not the most interesting but manageable if you put in the time to become comfortable with the applications. The exam and online tests are the trickiest parts of the course, so do plenty of practice questions before going into them.

Subject Content

1. **Introduction to Statistics**
2. **Basics of probability**
3. **Bivariate probability distributions**
4. **Continuous random variables**
5. **t-distribution and binomial distribution**
6. **Introduction to statistical inference**
7. **Hypothesis testing**
8. **Confidence intervals and testing errors**
9. **Comparing means**

10. Linear regression
11. Statistical inference with regression

The content in this subject is manageable in terms of difficulty. The first few weeks of content is quite easy, covering concepts that students will have already seen in high school. However, from Week 4 onwards, content becomes unfamiliar as the lecturers introduce statistical inference, which can be conceptually challenging at first. However, once you can understand the thinking behind hypothesis testing, the rest of the content essentially becomes applying that one concept in various settings.

Lectures

With the changes to teaching in 2020 resulting from the COVID-19 outbreak, all lectures bar the first 4 were held online. Regardless, they were informative and explained the concepts concisely but thoroughly. It is encouraged that students pause throughout the lectures to fully understand the reasoning and method behind each statistical technique, as well as trying to do the calculations themselves.

Tutorials

Again, with the changes to on-campus learning, all tutorials were held online. Each tutorial ran for an hour. While my tutor did his best to engage the class despite the change, I found that it was still difficult to maintain focus, but that is something that is inevitable with remote learning. The tutorials would consist of the tutor walking through the previous week's tutorial questions, some of which were appeared on the weekly quizzes that makes up 10% of your grade overall. We had the opportunity to attempt the questions ourselves in breakout rooms, but again this was rarely successful as students were quite reluctant to talk or discuss the problems. Nonetheless, I attended all tutorials anyway as it forced me to keep up to date with the content. Note that normally the 10% quiz mark requires of both attendance at the tutorial in addition to passing the online quiz, but with the change in teaching, passing the quiz was enough to secure the marks for that component.

Assessment

Online tests
There were two online tests, one in Week 4 and Week 8. Since the first few weeks of material are considerably easier than the latter weeks, students will naturally find the first online test to be far easier than the second. The second online test was quite challenging for many, since it covered statistical inference which can be difficult at first. The average mark for the second online test was around 13/21. Both tests contributed 5%, amounting to 10% in total.

Assignments
The assignment is worth 10% and is a business report. You were required to provide recommendations to several potential home buyers, using statistical evidence drawn from a provided dataset to support your recommendations. The assignment is intended to be a group assignment of up to 4 members, but it is manageable to complete it individually. The analysis is not particularly difficult and consists of applying the concepts learned in lectures but with more realistic data sets.

End-of-semester exam
The final end-of-semester exam was administered through Canvas and lasted for 3 hours, comprising 60% of your grade. Even though the exam was open-book, I found it to be harder than expected. The exam was quite long, and you had to spend almost all your time typing, leaving little time to even look concepts up and go

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through your notes. Content-wise, most of it was quite standard and again testing the practical applications of the concepts taught in lectures. There were a few tricky questions around the central limit theorem but for the most part, the exam questions were mainly about constructing and testing hypotheses. Therefore, being comfortable with hypothesis testing is of upmost important going into the exam.

ECON20002 Intermediate Microeconomics [SM1]

Lecturer(s)	Dr Svetlana Danilkina
Weekly contact hours	1 × 1.5-hour lecture 1 × 1 hour tutorial
Prerequisites	Introductory Microeconomics ECON10004
Assessments	Individual assignment 1 × 10% = 10% Individual assignment 1 × 10% = 10% Mid-semester test 1 x 20% = 20% 3-hour end-of-semester exam (hurdle) 60%
Textbook Recommendation	✗ **Not recommended**. Lecture notes are sufficient
Lecture Capture	Full (both audio and video)
Year and Semester Reviewed	2022 Semester 1

Comments

This subject builds upon the foundations of microeconomics taught in Introductory Microeconomics (ECON10004). It's an enjoyable subject for those who enjoy combining economics with some elements of mathematics. To perform well in the subject, it is recommended that students watch all the lectures and keep up with the tutorial tasks each week - particularly as the tutorials are what teaches students how to apply the knowledge to quiz/exam style questions.

Additional Information: This subject is a core for anyone planning to major in Economics.

Subject Content

Topic 1: Consumer Theory

- Discusses concepts such as the budget line, preferences, utility functions and utility maximisation. Introduces various graphs: income consumption curve, Engel curve, income elasticity of demand etc. and uses these to determine income and substitution effects.

Topic 2: Producer Theory

- Like concepts in consumer theory but looking at it from a producer's perspective i.e. isocost lines, cost minimisation, profit maximisation, long run output expansionary path.

Topic 3: Markets (Partial Equilibrium)

- A deeper dive into perfectly competitive and monopolistic markets.

Topic 4: General Equilibrium

- Students are introduced to Edgeworth Boxes and go through many applications of the E-box in the context of different economies - Robinson Crusoe Economy, Robinson Crusoe, and Friday Economy.

Topic 5: Game Theory and Oligopoly

- The content in this topic is very similar to the content taught in Introductory Microeconomics; it's probably one of the easiest topics in the subject.

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Topic 6: Choice Under Uncertainty

- Brief topic combining probability concepts such as expected value and variance with economic concepts like utility. Touches on the insurance market in an economic sense, comparing actuarially fair and actuarially unfair insurance.

Lectures

Lectures were held twice a week with two streams (morning/afternoon) of the same lecture - both run by Svetlana. Lectures were spent talking through the (at times, incredibly lengthy) lecture slides available on the LMS. As such, they felt very theory based with not a lot of opportunity given to practice applying any of the concepts (attend tutorials for this).

Tutorials

Tutorials were a really great place to consolidate the knowledge taught in the previous week's lectures, as well as practise applying this knowledge to longer form questions. Would highly recommend Cameron Low as a tutor. Though his tutorials weren't the most interactive (in large part due to his mostly unresponsive online audience), he is able to explain concepts very articulately and has useful PowerPoint slides.

Assessment

Assignments: Each assignment consisted of two parts. Part A consisted of an online quiz completed individually and Part B consisted of extended response questions to be completed in groups of up to 4 people (in your tutorial). The assignments, though somewhat tedious to do, were relatively easy to score well in.

Mid Semester Test: The MST was a timed online test completed in the same format as the weekly quizzes. However, the content of the MST was much more difficult than the practice material provided to us weekly, and some questions really tested the depths of our microeconomic knowledge and our ability to apply concepts.

Exam

The 3.5-hour exam is a hurdle requirement, meaning you must pass the exam to pass the subject. The exam consisted of:
Section A: 10 multiple choice questions. (20 marks)
Section B: 2 long answer questions. (20 marks)
Section C: 2 extended response questions. (40 marks)
Section A questions were chosen from a variety of topics and were generally longer than the normal weekly quiz questions. Section B1 and B2 involved responding to prompts and using graphs and curves to support your answer. Both questions in Section C incorporated multiple topics and were very lengthy, each containing their own parts within. Though 3.5 hours seems like a long period of time, given the length of some of the later questions, it is important to manage your time to ensure that you're able to work through the whole exam.

ECON30009 Macroeconomics [SM2]

Lecturer(s)	Dr James Hansen
Weekly contact hours	2 × 1-hour lectures 1 × 1-hour tutorial
Prerequisites	ECON20001 Intermediate Macroeconomics and ECON20002 Intermediate Microeconomics
Assessments	Group assignment, due in Week 5 - 8% 90-minute mid-semester exam in Week 6 - 20% Group assignment, due in Week 10 - 7% 2-hour end-of-semester exam - 65%
Textbook Recommendation	Auerbach, A.J. and Kotlikoff, L.J., 1998. Macroeconomics: An integrated approach. MIT Press.
Lecture Capture	Full (both audio and video)
Year and Semester Reviewed	2020 Semester 2

Comments

Macroeconomics takes a break from classical and Keynesian economics taught in its prerequisites and takes a "micro- founded" approach to answering macro questions. This subject teaches neoclassical economics — mainly in the form of the Overlapping Generations (OLG) model — to take another look at economic growth, business cycles, fiscal and monetary policies, and open economies.

The maths used in this subject and outcomes learnt were intuitive; however, the use of the same model throughout the semester (often only changing one or two variables/assumptions in each topic) made learning quite monotonous. You can sometimes grasp links between concepts learnt and real life, but these were few and far between. Ultimately, this subject seemed like a preparatory for research in economics and I would not recommend this subject unless you are very interested in economics/macroeconomics or pursuing further study in economics.

Additional Information: This subject can be taken as a commerce elective for the *Actuarial* major or count towards a double major in *Economics*.

Subject Content

1. **Review of Macroeconomic Research**: Recounted classical and Keynesian economics taught in earlier years and introduced neoclassical economics — the main approach taught in this subject — which uses microeconomic assumptions (household and firm optimisation) to build macroeconomic models.
2. **Introduction to the OLG model**: Builds the OLG or life-cycle model using the assumptions touched on in the previous topic and forms the basis for the rest of the semester. This topic also talks about long-run equilibrium and how the model can be adapted to simulate sustained economic growth.
3. **Real Business Cycle theory with OLG and Unemployment**: Touches on how the OLG model can be used to model short-run fluctuations in output and compares them to the stylised facts seen in empirical data. This topic also briefly introduces unemployment into the OLG model.

4. **Government Consumption and Fiscal Policies**: Introduces the Government entity into the OLG model and how different types of government intervention can affect consumer welfare and economic growth.
5. **Monetary Policy and Inflation**: Introduces money into the OLG model and discusses the neutrality and superneutrality of money.
6. **Two-country OLG model**: Models two countries using the OLG model to discuss the long-run effects of free capital flow for both economies. This topic also covers topic such as the trilemma, exchange rates and balance of payments.

Epidemiology in Macroeconomics: Although interesting, this topic felt rushed and tacked on. This topic briefly introduced the SIR model and discussed how it can be combined with the OLG model to showcase how economic decisions of individuals and policymakers can influence health and economic outcomes.

Lectures

Due to this semester's online delivery, lectures were split up into smaller subtopics and were pre-recorded and uploaded well in advance. Although some people might appreciate this format, I found that the transitions between lectures were jarring and affected my concentration. If you like to study in short 20-minute sprints, then this style will suit you.

The lecture slides are not sufficient for study. Although James does read off the slides quite a bit, he also spends a good majority of the lecture time elaborating on the concepts and providing examples. Therefore, it is helpful to follow along annotating your slides with his comments.

Tutorials

Tutorials were delivered weekly via Zoom and were generally conducted in two ways. In math-heavy tutorials, the tutor would talk us through the working out and intuition behind the formulae. Otherwise, theory-heavy tutorials involved separating into breakout rooms for discussion.

Like past economics subjects, you would have a tutorial sheet with a pre-tutorial section and an in-tutorial section. It is expected that the pre-tutorial section is to be completed before the tutorial, but I advise that you attempt both sections to meaningfully contribute to discussions in the tutorial.

Personally, the tutorials were the highlight of this subject. My tutor created a welcoming atmosphere that allowed students to feel comfortable sharing their cameras and facilitated engaging breakout rooms (contrasting to most other breakout room experiences this semester). Although this subject has tutorial participation marks in on-campus semesters, I recommend attending tutorials regardless of this incentive. The tutorials help provide a more intuitive understanding of the models covered in lectures and will often answer questions that you did not know you needed answers to.

Assessment

Assignments

The two group assignments were so easy, you would constantly question where you might have misunderstood the question. This sentiment was reflected in the high average marks (88%) and low standard deviations published for the assignments. For both assessments, you could choose your own groups and were given approximately two weeks to complete it. The assignments required you to derive OLG models (see end-of-semester exam section), plot the time trends in Excel, and comment on how your economy changes with different initial values and/or policies. The questions that required derivations and explanations are both textbook, so referring to the slides and tutorials will help you score well.

Mid-semester Exam

The format of the mid-semester exam was also like previous economics subjects with a true/false, short answer and long answer sections. You are given 90 minutes to read, write and submit your paper. As I had a relatively strong math background, I found this semester's MSE to be straightforward and straight out of the lectures. However, two key skills that could prove useful for future exams are: your ability to take partial derivatives for variables with time subscripts; and using the method of Lagrange multipliers to optimise functions with multiple constraints.

End-of-semester Exam

The format of the end-of-semester exam was the same as the mid-semester exam's — just longer. For this semester's online exam, we had three and a half hours to read, write and submit your paper. Although the exam itself was "designed" to be completed in two hours, I felt that it was made a bit longer and harder than the practice exams provided.

The exam itself was challenging compared to the in-semester assessments. Whilst the multiple-choice and short answer questions are possible adaptions of tutorial and assignment questions, the long answer questions will very likely ask you to derive the OLG model and analyse the time trends and/or equilibrium. These types of questions often follow the same structure:

1. Find optimal household consumption
2. Find optimal firm profit conditions
3. Solve for market clearing conditions
4. Derive the capital transition equation using 1–3

To maximise your chances of success, make sure you are familiar with performing these derivations no matter what initial assumptions you might have for the model.

MUSI20164 Free Play New Music Improv Ensem [SUM]

Lecturer(s)	Mr Alex Pertout
Weekly contact hours	3 × 2-hour classes(intensive summer period)
Assessments	Active contribution to all class discussions and performances as directed: 50% Self-reflection essay 15% Final video performance 35%
Textbook Recommendation	N/A
Lecture Capture	No record, need to participate in each class in person/online zoom
Year and Semester Reviewed	2022 Summer

Comments

This subject is a breadth level-2 subject for actuarial students. It is also friendly to people without any music background. It is highly recommended to participate in each class planned in your timetable, not only for the participation marks, but also you can learn a lot of new knowledge in music field which can be used in your self-reflection essay and final video performance. People who enjoy participating in class would enjoy this subject a lot.

Exclusion Criteria: Subject **not** available for Diploma in Music or Bachelor of Music students.

Subject Content

In-Depth Study of Improvisation:
- Rigorous practical study of improvisation techniques.
- Introduction to improvisation as a unique art form.

Performance-Based Approach:
- Emphasis on practical application in musical improvisation.
- Targeted at musicians with limited improvisational experience.
- Instrumental and Vocal Inclusivity:
- Open to all musicians, regardless of their primary instrument or vocal speciality.

Exploration of Musical Freedom:
- Engagement with 'free play ensemble' to foster new dimensions of musical autonomy.

Intended Learning Outcomes:
- Mastery of improvisation as real-time composition with emphasis on various musical elements.
- Comprehension of music creation from a perspective of 'play' and group dynamics.
- Development of personal improvisational styles and methods.
- Enhanced awareness of music's auditory nature and site-specific influences.
- Cultivation of musical imagination and intuitive skills.

Lectures

N/A

Classes

The participation of the classes is essential for this subject, normally the class would be divided into three parts: meditation, guessing what materials produced the sound from the audio and learning music knowledge. Most of the time after each class, students need to capture some beautiful or interesting sounds from daily life for others to guess in the next class. Lecturer really wants students to engage each class well, so I really recommend making yourself engaged in each class well maybe by answering lecturers' questions, discussing sound parameters in the breakout room, and guessing the sound origins in class.

Assessment

Self-reflection essay

A 500- word of essay would be required at the end of study, so making notes of every class's music knowledge would be preferred so that you can write the self-reflection essay easier. I also recommend writing your improvement after the whole semester study in the essay in detailed

Final video performance

The final video performance is that you need to record yourself a 4 to 5 min video with performance of improvisation. It is recommended to start of thinking your topic of the story after mid-semester. It is preferred to think a rather interesting topic or idea to play and using different various of materials to make that sound. An interesting idea would attract lecturer and other students' attentions so it would be easier to get a higher mark. The students would a chance to play their trial video in front of lecturer and other students to get some feedback to improve before giving their final performance in the last class. Also, a description of the video is also required to describe the story of the video's sounds trying to make. It is recommended to use all the points you study during the whole semester into the video and make it attractive while changing the sound parameters

MUST20010 Singing and the Power of Pop Music [SM1]

Lecturer(s)	Mr Geoffrey Williams
Weekly contact hours	1 × 1-hour lecture 1 × 2-hour tutorial
Assessments	Group Pop Song Performance 10% Weekly Contributions to Online Forum 40% Group Performance on three Pop Songs 10% Written Assignment (1600 words) 40%
Textbook Recommendation	Readings prescribed on LMS ✗ **Not recommended**. Would be useful for the weekly reflections but not necessary for the final essay as you will be required to do your own research on a topic + song of your choice instead. As the readings are usually poor-quality scans and are very time-consuming to read, would not recommend
Lecture Capture	Full (both audio and video)
Year and Semester Reviewed	2022 Semester 1

Comments

Although the name and code of the subject suggest that it is a music and singing subject, the lecture content does not relate to singing at all, it is mostly about music and its progression over the decades (you start by learning Elvis, some things about slavery, civil rights movement, and slowly progress to MJ, Lady Gaga, and rap + politics). The content can be cool and interesting if you are passionate about music and its impact on history and politics but be warned most of the lectures are just the lecturer screen-sharing YouTube videos. The subject is relatively chill and relaxed in its teaching style as it is designed to be a breadth subject, I don't recall having actual music students in the class, it was mostly arts majors. In my opinion it is more an arts subject than a music subject, since only 20% of the assessments were singing - and they were both group performances so not much preparation needed - but 80% of your grade depends on written assignments. You still learn singing techniques in tutorials and the tutor Jackie is very fun.

The writing part of the subject is quite challenging and requires a fair bit of commitment, since there is a reflection due every week (150 words) that requires quite a bit of research and you will be marked on your research and citations (Chicago A footnotes), as well as how logical your arguments are, and how well everything flows etc. It was also very hard for me to get an H1 in them - I in fact never did in any of my 11 reflections. However, that is not to say that it is impossible to do well in the subject, the standard of writing might have just been set higher in my cohort by the 80% of arts students taking the subject.

Overall, would recommend taking this subject if 1. you are confident in research and writing, 2. you have an interest in music, history, and/or politics, 3. you don't mind travelling to south bank campus once a week. Otherwise, would not recommend.

No prerequisite, offered both semesters, level 2 breadth

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BUSINESS &
ECONOMICS

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Subject Content

1. **What are you empowering yourself with when you sing?**
   Overview of the course; what is expected of you; what are you empowering yourself with when singing these songs?

2. **1950s: Elvis Presley, Appropriation, and the invisible women**
   Artist focus on Elvis Presley, the music industry at the time and key socio-cultural factors influencing music.

3. **1960s: Girl Groups, Motown & The Beatles pt 1.**
   Focus on The Beatles, Motown music and the numerous girl groups that were part of pop music in the 1960s and what this reflected about (western) society at the time.

4. **1960s: Girl Groups, Motown & The Beatles pt 2.**
   Focus on The Beatles, Motown music and the numerous girl groups that were part of pop music in the 1960s and what this reflects about (western) society at this time.

5. **1960s/70s: Aretha Franklin & Stevie Wonder**
   Focus on two highly influential artists, Aretha Franklin, and Stevie Wonder.

6. **1960s/70s: Artists – Bowie & Joni Mitchell**
   Focus on pop artist David Bowie and jazz folk artist Joni Mitchell and looking at the socio-cultural factors influencing these areas of popular music.

7. **1970s/80s: Michael Jackson and the redefining of the mainstream**
   Focus on Michael Jackson as a pop artist who redefined mainstream pop music. But there was also someone else who was equally innovative… here's a hint: who had the most top 5 hits from one album at this time?

8. **1980s/90s: Madonna and Whitney Houston**
   Focus on two big pop stars of the 1990s gives us an insight into some key socio-cultural issues that were impacting on pop music at the time.

9. **The Birth of Rap**
   Looking at its place in pop music, tracing early beginnings towards its mainstream inclusion. Considering the social and political impact of rap.

10. **Southbank Library Research skills session & The Cutting Room Floor**
    Looking at the phenomenon of manufactured music, YouTube & Reality TV and what this tells us about society currently.

11. **Academic Skills Unit Session & 2000s Genre-blurring Political Pop**
    Southbank Library will come and deliver a session on research skills specific to this subject and will also discuss referencing and finding appropriate sources to help with the final creative writing task. Lecture will focus on the 2000's where pop styles and genres start to become more blurred, reflecting increased globalisation. This has a relationship to politics too, as we see pop artists using their music to convey political messages and politics using pop music for their benefit.

12. **Performance week, no lecture**

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Appendix

Exemptions Guide

The University of Melbourne allows you to fulfil the Actuaries Institute accreditation requirements for all **the Foundation Program** and half of the **Actuary Program** — the other half of which is obtained through the Institute. Exemptions are obtained by completing groups of university subjects with satisfactory grades, which allow you to be exempt from the exam of the corresponding Institute subjects shown in Table 1 and Table 2.

Exemption Marks

Exemption marks are used to calculate whether an exemption is awarded. These marks are calculated after the corresponding subject is graded, and is chosen by the Centre for Actuarial Studies based off the strength of the cohort and distribution of the final scores with the following formula:

$$\text{exemption mark} = \text{subject score} - \text{exemption cutoff}$$

From 2021, for university subjects involved in the exemption of Foundation Program subjects, the final subject score will be used to calculate the exemption mark; for university subjects involved in the exemption of Actuary Program subjects, only the score achieved in the final exam counts towards to the exemption mark. Although the exemption cut-off mark varies across cohorts, the marks shown in Table 3 can be used as a reference for the marks needed to obtain exemptions.

To secure the exemption for a particular institute subject, the weighted average of the exemption marks associated with the institute subject must be above zero:

$$exemption = \left(\sum_{i \in A} exemption\_mark_i * weight_i > 0 \right)$$

Where A is the group of university subjects that contribute towards the institute subject.

E.g., ACTL20001 and ACTL30003 count towards the CM1 exemption (and are equally weighted). These weights and groupings can be viewed in Table 4 and Table 5.

Example: Grace would like to determine her eligibility for the CS2 exemption.
1. She received 71, 82, 74 for ACTL30001, ACTL30002 and ACTL30007.
2. She calculates her exemption marks using the 2020 exemption cut-offs as -4, +9 and +4 for the three subjects respectively.
3. The weighted average of her exemption marks is: –4 × 0.3333 + 9 × 0.3333 + 4 × 0.3334 = 3.0001, which is greater than zero.

Grace is eligible for the CS2 exemption.

List of Core Principle Exemptions

Undergraduate Exemption Subjects

Table 1: Actuaries Institute Core Principle subjects and corresponding undergraduate university subjects

Table 1: Actuaries Institute Core Principle subjects and corresponding undergraduate university subjects

Institute subject	University subject(s)		Weight
Foundation Program			
***CM* Actuarial Mathematics**			
CM1 *Actuarial Mathematics I*	ACTL20001	Introductory Financial Mathematics	50%
	ACTL30003	Contingencies	50%
CM2 *Financial Engineering and Loss Reserving*	ACTL20004	Topics in Actuarial Studies	33.33%
	ACTL30006	Intermediate Financial Mathematics	33.33%
	ACTL40004	Advanced Financial Mathematics	33.34%
***CS* Actuarial Statistics**			
CS1 *Actuarial Statistics I*	MAST20004	Probability	33.33%
	MAST20005	Statistics	33.33%
	ACTL30004	Actuarial Statistics	33.34%
CS2 *Risk Modelling and Survival Analysis*	ACTL30001	Actuarial Modelling I	33.33%
	ACTL30002	Actuarial Modelling II	33.33%
	ACTL30007	Actuarial Modelling III	33.34%
***CB* Business**			
CB1 *Business Finance*	ACCT10002	Introductory Financial Accounting	50%
	FNCE10002	Principles of Finance	50%
CB2 *Business Economics*	ECON10004	Introductory Microeconomics	50%
	ECON20001	Intermediate Macroeconomics	50%
Actuary Program			
***ACC* Actuarial Control Cycle**	ACTL40006	Actuarial Practice and Control I	50%
	ACTL40007	Actuarial Practice and Control II	50%
***DAP* Data Analytics Principles**	ACTL40012	Actuarial Analytics and Data II	100%

Source: *Centre for Actuarial Studies* and the *Actuaries Institute*
Current as of 17th December 2020.

Postgraduate Exemption Subjects

Table 2: Actuaries Institute Core Principle subjects and corresponding postgraduate university subjects

Table 2: Actuaries Institute Core Principle subjects and corresponding postgraduate university subjects

Institute subject	University subject(s)		Weight
Foundation Program			
***CM* Actuarial Mathematics**			
CM1 *Actuarial Mathematics I*	ACTL90001	Mathematics of Finance I	50%
	ACTL90005	Life Contingencies	50%
CM2 *Financial Engineering and Loss Reserving*	ACTL90021	Topics in Insurance and Finance	33.33%
	ACTL90002	Mathematics of Finance II	33.33%
	ACTL90003	Mathematics of Finance III	33.34%
***CS* Actuarial Statistics**			
CS1 *Actuarial Statistics I*	MAST20004	Probability	33.33%
	MAST20005	Statistics	33.33%
	ACTL90008	Statistical Techniques in Insurance	33.34%
CS2 *Risk Modelling and Survival Analysis*	ACTL90006	Life Insurance Models I	33.33%
	ACTL90007	Life Insurance Models II	33.33%
	ACTL90020	General Insurance Modelling	33.34%
***CB* Business**			
CB1 *Business Finance*	ACCT90042	Accounting and Finance for Actuaries	100%
CB2 *Business Economics*	ACTL90022	Economics for Actuaries	100%
Actuary Program			
***ACC* Actuarial Control Cycle**	ACTL90010	Actuarial Practice and Control I	50%
	ACTL90011	Actuarial Practice and Control II	50%
***DAP* Data Analytics Principles**	ACTL90019	Data Analytics in Insurance 2	100%

Source: *Centre for Actuarial Studies* and the *Actuaries Institute*
Current as of 17th December 2020.

Exemption Cut-Offs for 2023

Table 3: Summary of the exemption cut-off scores for all ACTL subjects in 2023.
Note: These cut-offs change every single year and are up to the Centre for Actuarial Studies*

Level 2 Subjects

ACTL20001 – *Introductory Financial Mathematics*	70
ACTL20004 – *Topics in Actuarial Studies*	70

Level 3 Subjects

ACTL30001 – *Actuarial Modelling I*	70
ACTL30002 – *Actuarial Modelling II*	70
ACTL30003 – *Contingencies*	73
ACTL30004 – *Actuarial Statistics*	70
ACTL30006 – *Intermediate Financial Mathematics*	72
ACTL30007 – *Actuarial Modelling III*	70

Level 4 (Honours) Subjects

ACTL40004 – *Advanced Financial Mathematics*	71
ACTL40012 – *Actuarial Analytics and Data II*	66
ACTL40006 – *Actuarial Practice and Control I*	70

Level 9 (Masters) Subjects

ACTL90001 – *Mathematics of Finance I*	70
ACTL90002 – *Mathematics of Finance II*	70
ACTL90003 – *Mathematics of Finance III*	71
ACTL90004 – *Insurance Risk Models*	70
ACTL90006 – *Life Insurance Models I*	70
ACTL90008 – *Statistical Techniques in Insurance*	70
ACTL90010 – *Actuarial Practice and Control I*	70
ACTL90011 – *Actuarial Practice and Control II*	70
ACTL90019 – *Data Analytics in Insurance 2*	66
ACTL90020 – *General Insurance Modelling*	70
ACTL90021 – *Topics in Insurance and Finance*	70

Note: for ALL 'non-Actuarial' subjects (i.e., do not have the subject code ACTL), the exemption cut-off mark is 73.

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Mathematics Prerequisites for the Actuarial Major

The second-year subjects that sets the foundation for all subjects in the Actuarial Studies major are MAST20004 Probability and ACTL20001 Introductory Financial Mathematics – the prerequisites for every ACTL subject can be traced back to these two subjects. To be eligible to enrol in MAST20004 and ACTL20001 in your second year, you must have fundamentals in both linear algebra and calculus, shown through your satisfactory performance in the University of Melbourne subjects or equivalent.

Linear Algebra	Calculus
MAST10007 Linear Algebra	MAST10006 Calculus 2
MAST10022 Linear Algebra: Advanced	MAST100021 Calculus 2: Advanced
MAST10007 Accelerated Mathematics 1	MAST10009 Accelerated Mathematics 2

Whilst the requisite conditions for MAST20004 Probability is straight forward:
- Obtaining a **pass** in any subject from the list of Linear Algebra subjects, and.
- Obtaining a mark of **60 or greater** in any subject from the list of Calculus subjects

Meeting the requisite conditions for ACTL20001 Introductory Financial Mathematics can be confusing and the Actuarial Students' Society have tried to summarise these conditions with Table 3 *(on the next page).* To meet the requirements of ACTL20001, you must complete one of the Linear Algebra subjects and one of the Calculus subjects and receive a combined mark greater or equal to the cell corresponding to the associated row and column.

Ineligible for MAST10006/MAST10007
If you have not met the high school prerequisites for MAST10006 and/or MAST10007, you may replace ACTL10001 with MAST10005 in your study plan to meet the prerequisites for MAST10006 and MAST10007.

University of Melbourne Extension Program (UMEP) Mathematics
If you have completed MAST10018 Linear Algebra Extension Studies and MAST10019 Calculus Extension Studies
- with a combined score of 150 or more, you are eligible for ACTL20001.
- with a combined score above 135 but lower than 150, you must pass MAST20026 Real Analysis to be eligible for ACTL20001.

Summary of Mathematics Prerequisite Conditions for ACTL20001

Table 4

Subject Combinations	Total Score Required (out of 200)	Condition
MAST10006 or MAST10021 AND MAST10007 or MAST10022	150	None
MAST10008 AND MAST10009	120	Pass in each subject
MAST10007 or MAST10022 AND MAST10009	135	Pass in each subject
MAST10008 AND MAST10006 or MAST10021	135	Pass in each subject
MAST10018 Linear Algebra Extension Studies AND MAST10006 or MAST10021	150	None
MAST10013 UMEP Math for High Achieving Students AND MAST10009	120	Pass in each subject

Example:
Rose received a 68 and 83 for MAST10008 and MAST10006, respectively. As the combined score is 151 and is greater than 135, Rose can enrol in ACTL20001.

DISCLAIMER: These prerequisite cut-offs are strict; for example, if you obtain a combined 149 for MAST10007 and MAST10006, then you will <u>NOT</u> be eligible for ACTL20001 (as a combined score of at least 150 is required). <u>NO exceptions will be made.</u>

Sample Actuarial Course Plans and Other Resources

Note: If any issues arise with planning your course, please seek advice from Stop 1

Centre for Actuarial Studies Student Resources

Please refer to : https://fbe.unimelb.edu.au/economics/ACT/courses/current_students (Credit. The University of Melbourne)

This page has information regarding studying actuarial studies at the University of Melbourne. Such as: subject information, undergraduate and graduate course guides, actuarial exemptions guides and past exam papers.

Undergraduate Studies (Bachelor of Commerce)

Please refer to: https://course-planner.unimelb.edu.au/ (Credit. The University of Melbourne)

Input the Bachelor of Commerce and load the "Actuarial Studies (Major), Actuarial Studies Major with Accreditation" template.

***Please Note:** The following is a GUIDE and may not represent the specific course plan which suits you*

Subjects left to choose from the actuarial major template:
- 1 subject in 1st year, semester 1: Used to fulfill ACTL20001 mathematics prerequisites *please refer to mathematics prerequisites for actuarial course major*.
    - Common subjects include Linear Algebra, Accelerated Mathematics 1, or Linear Algebra: Advanced
- 1 subject in 1st year, semester 2: Used to fulfill ACTL20001 mathematics prerequisites *please refer to mathematics prerequisites for actuarial course major*
    - Common subjects include Calculus 2, Accelerated Mathematics 2, or Calculus 2: Advanced
- 1 subject in 3rd year, semester 2: Used to fulfil breadth credit point requirements.
    - Can complete any non-maths eligible breadth subject. Can be from any eligible discipline of your choosing.

Graduate Studies (Master of Actuarial Science)

Please refer to: https://study.unimelb.edu.au/find/courses/graduate/master-of-actuarial-science/what-will-i-study/#sample-plans (Credit. The University of Melbourne)

This page outlines a sample 150-credit point course plan.

Doctoral Program in Actuarial Studies

For all information regarding this program, please refer to:
https://study.unimelb.edu.au/find/courses/graduate/doctoral-program-in-actuarial-studies/ (Credit. The University of Melbourne)