SUBJECT REVIEW

2016 EDITION

Contents

Preface

By now, you have probably ascertained that you may want to be an actuary. But what must one learn to become an actuary? A quick Google search for "actuarial science" will bring up this Wikipedia definition:

> Actuarial science is the discipline that applies mathematical and statistical methods to assess risk in insurance, finance and other industries and professions.

Perhaps this suggests a predominant study of mathematics, statistics, and finance. Nevertheless, this gives no headway as to what exactly an actuarial student may encounter in their university studies. As it turns out, the path to becoming an actuary is arduously complex, and the Actuarial Students' Society has recognised this.

This publication is the product of the society's efforts to create greater transparency regarding the subjects studied as part of an Actuarial Studies major under the Bachelor of Commerce degree. Through this, we hope that students hoping to graduate from the major may gain not only greater insight to the content studied in these subjects, but also general tips and advice that past students have provided from their own experience of studying the subjects. With authors coming from a range of different backgrounds, we hope to highlight the obstacles and challenges in each subject so that students may prepare themselves better in their studies.

In the 2016 edition of the *Actuarial Students' Society Subject Review*, the society expanded coverage from 17 subjects to an impressive 31 subjects. The *Actuarial Students' Society Subject Review* now contains reviews for all core subjects in the 3-year undergraduate Actuarial Studies major. Furthermore, for the first time, reviews for subjects in the Honours-year program as well as common breadth and elective options for Actuarial Studies students have been included in the subject review.

Invariably, each review will be an expression of opinion—we urge readers to be conscious of this fact, as the subject experience may differ from individual from individual.

Please take note of the year and semester of each subject review. Subject content, structure, and personnel undergo continuous change, and it is important to recognise whether the reviewed curriculum has since been superseded. Such reviews will, however, still serve as a reliable reference for the general direction of the subject.

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

About the Actuarial Students' Society

The Actuarial Students' Society is the representative body for all actuarial students at the University of Melbourne. Since being founded by actuarial students in the mid-90s, the society has been an important link between students, the university, and employers. Our aim is to enhance the social and professional lives of our members. We help prospective actuaries build bridges and make connections with other students, mentors, and potential employers.

We host an array of events throughout the year and all students are welcome to attend. We provide valuable exposure to the industry at our premier event of the year, Contact Night, as well as career luncheons and workshops. Events such as Trivia Night, Poker Night, and Pool Night are great ways to make friends and have fun with fellow students and qualified actuaries in a relaxed, informal manner.

Our sponsors are industry leaders and always on the lookout for the best and brightest. We provide our members with information regarding internship and employment opportunities directly from our sponsors, along with many events where you can brush shoulders with practising actuaries.

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

www.melbourneactuary.com

www.facebook.com/actuarialstudentssociety

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Disclaimer

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First-Year Subjects

ACCT10001 Accounting Reports and Analysis (1)

Exemption status	Not an exemption subject, but is a prerequisite for ACCT10002 *Introductory Financial Accounting* (CT2 *Finance and Financial Reporting* subject).
Lecturer(s)	Mr Matt Dyki Miss Michelle Hoggan Professor Michael Davern
Weekly contact hours	1 × 2-hour lecture 1 × 1-hour tutorial
Assessments	Tutorial attendance and participation 8% 2 tutorial work submissions 2 × 1% Group assignment 20% 3-hour end-of-semester exam 70%
Textbook recommendation	Birt, J., Chalmers, K., Maloney, S., Byrne, S., Brooks, A., & Oliver, J. (2014). *Accounting: Business Reporting for Decision Making* (5th ed.). New York, US: John Wiley & Sons Inc. The textbook is often referred to in tutorials for content and questions that appear in tutorial work, so having access to one (not necessarily purchasing) is beneficial. That being said, the textbook content is far too detailed and prescribed readings that span full chapters are generally at least 80% irrelevant. ✓ My personal advice is to purchase the e-text (only accessible through a program/app "VitalSource Bookshelf") which can be shared across 2 computers and 2 mobile devices. This will set you back $50, or $25 if shared between 2 ($12.50 if shared between 4 etc.).
Lecture capture	Yes (both audio and video).
Year and semester reviewed	2015 Semester 1

Comments

This is the first accounting subject that you will encounter at university and is essentially a straightforward introduction into the field of study. The instruction and assessment of this subject both explore the ambiguity of questions and carry a heavy emphasis on **JUDGEMENT** (you'll see), as well as your ability to justify your responses.

A natural association that many made was the one between VCE Accounting and this subject. However this was a dangerous one to make, as VCE Accounting gives you close to no advantage over others and is rather more likely to make you complacent in studying this subject. The content covered in this subject is basic; however it is your ability to articulate your arguments and justify responses that will differentiate you from the cohort. This subject **can be** the easiest core subject you do in Semester 1, and I would advise you take it as an opportunity to hone your ability to answer questions effectively, which will be advantageous to the rest of your BCom studies.

Subject content

As ARA is the first accounting subject at university, the first week of lectures and tutorials covered mostly an introduction to accounting, which was boring, to say the least. However, ignoring it is not advised, as it has been made clear that an exam question such as "What is accounting?" is very much feasible and has stumped many students in the past.

Between Weeks 2 and 5, the subject systematically covers key accounting elements (assets, liabilities, equity, revenue, and expenses). It does so by going through the definition and recognition criteria of each element, discussing the methods by which to recognise, measure, and report each element, before proceeding to evaluate possible issues and **JUDGEMENT** to be made with each one through the discussion of a specific case study. The 4 lectures (2–5) cover the foundations of accounting and the concepts covered are recycled throughout the rest of ARA and also ACCT10002 *Introductory Financial Accounting*. Though they require some **rote**-learning, gaining an appropriate level of understanding through these weeks is strongly advised.

Lectures 6–12 cover the area of management accounting, which is where the majority of the essay writing you do in this subject comes into play. It begins with ratio analysis, which is the definition, calculation, and interpretation of various accounting ratios denoted by wonderful acronyms such as ROA, ROE, NPAT, EBITDA, NTAB, PE etc. Although these do get quite repetitive, understanding them is essential for your group assignment (to be elaborated upon later).

Lectures 7–10 cover management decisions involving accounting, namely cost analysis, pricing, and budgeting. These require a small number of calculations, and although predominantly straightforward, some do require you to pay attention to the wording of the question. The arithmetic is the easiest part of the subject (for us obviously), and in accordance with the stereotypical actuarial student, the extended responses are the hardest. Of course, nothing in this subject is impossible, and preparation for this particular section can be done through analysing as many case studies as possible, doing all the tutorial work and answering past exam questions.

The subject ends with an in-lecture share market game (lecture 11) and a recap of the subject (lecture 12). The former is more 'fun' than practically useful, while the latter is, well, the opposite. I would strongly advise attendance for the last revision lecture, as it is often a good indicator of what to expect on the exam.

Lectures

The lecture notes for this subject are, in my personal opinion, the best foundation upon which to base your studies. As previously mentioned, the prescribed pre-readings for this subject are much too broad; however, if you only read sections which build upon what is addressed in lectures, you will gain a deeper understanding, without wasting too much time.

Fortunately, this subject has—courtesy of the faculty—constructed its lectures such that attendance is almost discouraged. The quality of the notes, combined with the recording of **everything** covered on screen in-lecture, makes it such that missing a lecture does not disadvantage you in any way (assuming you bother to catch up). It is a common joke amongst first-years to boast about the speed at which we watch lectures on lecture capture, and I can assure you ARA lectures are quite easily a 1.8× out of a possible 2.0×.

In approaching lectures for this subject, I would advise you to use the notes and read up on the textbook when needing further clarification but to watch the sections of the lectures which cover case studies.

Tutorials

As 8% of your score will be based off your tutorials, attendance and participation are strongly recommended.

The marking criteria and distribution of this 8% are quite complex, and the best thing you can do to assure you get a high score is just to try your best in tutorials. Despite the cliché, tutorials really are quite useful in this subject, particularly the tutorial questions that are discussed each week. Depending on your tutor, the structure of a tutorial usually entails a quick recap of the covered content, followed by some curated questions and the discussion of said questions.

There are numerous tutorial questions that will be provided, and many more are suggested in the WileyPlus textbook. These will serve as extremely good revision for the exam.

Additionally, there is a weekly online quiz which is predominantly multiple-choice and accounts for a small percentage of your subject score. These are extremely easy, and it is almost impossible not to get 100% with the perk of collaboration, the ability to refer to a textbook, and the generosity of a second try.

The best thing about tutorials were the 2 written submissions for feedback. These were past exam/exam-style questions which were marked by tutors and for which comprehensive feedback was provided. These are worth 1% each to encourage their completion, though the feedback is worth much more than the allocated mark.

Assignments

There is one main collaborative assignment for ARA which you are allowed to form your own group to complete. This assignment is designed to examine the ability to calculate and interpret various accounting ratios, (something not easily examinable in the exam).

The assignment is divided into 2 parts. Part A Is worth 25% of the assignment (5% of your total grade) and comprises of calculations of ratios. Part B is worth 75% of the assignment and is the primary focus of the task. In this section, your group will draw upon the results of the calculations in part A and write up an analysis of said results. This assignment is hard to score well in due to the vague instruction and room for individuality. However, time is not at all an issue and the calculations are mostly straightforward. Since the originality of your analysis is limited by the prescribed figures, the best method to create a H1-worthy assignment is to create a structured report with flowing arguments and good presentation.

End-of-semester exam

The exam is split into Part A (10 marks, multiple-choice), Part B (financial accounting), and Part C (management accounting). Part A, as with most multiple-choice sections, is quite easy to score well in.

Part B of the exam requires you to recite some definitions of accounting elements and often apply these definitions to an explanation of how and why you would record a certain item. These are often shorter questions, and the main marks come from definitions and references to qualitative characteristics of accounting elements. In some exams, there is a table which requires you to fill in entries in the correct category, which is for the most part straightforward.

Part C is where the majority of students fall over and where the good ones stand out. With management accounting, there is an abundance of the task words "identify" and "explain" in questions, as well as "Why?" and "discuss". These

are all longer questions and are worth more than the part B questions. It is imperative that you discuss as many relevant points as necessary in this section to gain the maximum number of marks.

Concluding remarks

Not the most riveting of subjects in term of subject content; however, the completion of this subject will prepare you well for the upcoming IFA (which is an exemption subject). This is one of the few subjects where you can get a good score without spending all of your time on it, so don't waste the opportunity. Study hard and I wish you a H1 in this lovely introduction to accounting at university.

ACCT10001 Accounting Reports and Analysis (2)

Exemption status	Not an exemption subject, but is a prerequisite for ACCT10002 *Introductory Financial Accounting* (CT2 *Finance and Financial Reporting* subject).
Lecturer(s)	Mr Matt Dyki Miss Michelle Hoggan Professor Michael Davern
Weekly contact hours	1 × 2-hour lecture 1 × 1-hour tutorial
Assessments	Tutorial attendance and participation 8% 2 tutorial work submissions 2 × 1% Group assignment 20% 3-hour end-of-semester exam 70%
Textbook recommendation	Birt, J., Chalmers, K., Maloney, S., Byrne, S., Brooks, A., & Oliver, J. (2014). *Accounting: Business Reporting for Decision Making* (5th ed.). New York, US: John Wiley & Sons Inc. ✓ The textbook was necessary to complete the online tests. It is expected that textbook readings are done before each week's lecture.
Lecture capture	Yes (both audio and video).
Year and semester reviewed	2015 Semester 1

Comments

Subject content

This subject is heavily focused on analysis rather than recording. It is up to you to learn the basic concepts, explored in the pre-lecture textbook readings. Multiple readings may be necessary. A big change from any high-school subject is that you cannot rely on teachers pushing you to do work; it is very important to be self-disciplined and work consistently. Personally, I felt that the subject started off more challenging and ended with some slightly easier content.

Lectures

Lectures are quite fast-paced, especially if you've never done an accounting subject before. Note-taking is very helpful for revision purposes nearing the end of semester; this may require going over the lecture recordings again.

Tutorials

Tutorials really do help for this subject. It is very important to participate in tutorial exercises; these questions are similar to exam questions and are very helpful in consolidating your understanding of the concepts. Often the questions have multiple correct answers as long as they are justified. It is important to understand all of these answers and be able to go both ways. Also keep your tutorial sheets—they will be useful for exam revision.

Assignments

The assignment was a group assignment and separated into 2 parts. The first part involves calculation of ratios that will be used in the second part for analysis. A good idea is to start thinking about how you are going to do the second part or even start the second part of the assignment before the lecturers tell you to. For the first part, it is most beneficial to each individual and the group to come up with the ratios individually and double-check your answers that are different. For part 2, it will require all group members to meet up regularly. Pay extra attention on the lecture preceding part 2 of the assignment. Other than that, there is little instruction on how to do the assignment.

Timed assessments

Each week there will be an online test. These are simple if you've done your textbook readings, and you will get 2 attempts.

End-of-semester exam

For exam revision, I would recommend first going over all of your notes, and then do the tutorial sheets again. You don't have to write the answers out. Just thinking in your brain is enough; make a note if you miss any points that are in the answers. Then do practice exams and go back to the textbook for any concepts you forgot about. In the exam there are sometimes recycled questions and questions of similar format. Also do not freak out if something doesn't make sense in the exam. Just skip the question; the exam could have mistakes on it.

ACCT10002 Introductory Financial Accounting

Exemption status	CT2 *Finance and Financial Reporting*, in conjunction with FNCE20001 *Business Finance*. An average of 73 across this subject and FNCE20001 *Business Finance* is needed, with no fails.
Lecturer(s)	Mr Warren McKeown
Weekly contact hours	1 × 2-hour lecture 1 × 1-hour tutorial
Assessments	Tutorial attendance and participation 5% Individual assignments 25% 3-hour end-of-semester exam 70%
Textbook recommendation	Carlon, S., Mladenovic, R., Loftus, J., Palm, C., Kimmel, P.D., Kieso, D.E., & Weygandt, J.J. (2010). *Financial Accounting Building Accounting Knowledge*. Milton, AU: John Wiley & Sons Australia Ltd. ✗ Note the textbook is simply a repeat of what is in the lecture slides and is definitely not required to do well. As it is quite expensive, consider purchasing the $50 online book off VitalSource if you desperately need one.
Lecture capture	Yes (both audio and video).
Year and semester reviewed	2015 Semester 2

Comments

In first year, there are only two subjects that are part of the CT exemption subjects: ECON10004 *Introductory Microeconomics* and ACCT10002 Introductory Financial Accounting. This means that a score of 73% or above in these subjects should be aimed for, as this will ensure the exemption requirements are met.

Overall, this subject was met with disorder, where the content was basic (debits and credits/assets, liabilities, equity), while the exam garnered a mixed response.

Subject content

Having successfully completed the monstrous ACCT10001 *Accounting Reports and Analysis* (ARA) in Semester 1, this subject should be extremely similar, if not the same. Content-wise, this is a good sign; if you bothered trying in ARA, this means you will definitely have an advantage. If asking for a subjective benchmark against ARA, Introductory Financial Accounting is probably half, or even less, difficult theory-wise.

There is a lot of grunt work to do with journal entries and the occasional extended response question. By the end of the semester, you will be extremely familiar with the various classes of assets, liabilities, and equity, including Accounts Receivable, Accounts Payable, Share Capital, and how to journalise them. Note that this subject does cover each class in greater detail than ARA, so be expected to go into a bit more detail. However, most of the content doesn't stand out; it is extremely repetitive, easily remembered (if time and effort is put in), and should be

no challenge for most students. There is also a lot of usage of T-Accounts, especially when learning about the cash flow statement.

Also, remember ratio analysis from ARA? You're going to be doing a bit of this each week starting pretty early on, and yes, it's extremely repetitive and boring. However, it is not as extensive as the assignment given in ARA, and you only learn around 2–3 ratios per week.

You will end with share issues and share-related theory. This is quite straightforward; take a while to familiarise yourself with this equity account, and it should be a breeze.

Overall, the aim of the subject seems to be drilling the importance of debits/credits and the double-entry system within students.

Lectures

The lectures will seem quite monotonous and repetitive, given that what you will be learning is similar each and every week (that is, debits and credits for various accounting classes). For example, you will start off assuming little knowledge in debits and credits, and move into assets, liabilities, and equity quickly after.

Warren is also a lecturer who likes to hint at what will be on the exam during his lectures, so try to follow onto these!

While lectures are recorded (there are three repeated every week, so you can choose from whichever to download and replay), and I would personally say that skipping them is possible, I would advise you attend some of them at least, because he is an all-round great guy who actually tries to make his lectures entertaining.

The lecture notes are very comprehensive; there are examples and guides on how to process each accounting journal entry, and you will probably be swamped with information by the end of the lecture.

Warren is a lecturer who likes to include little case studies at the end of lectures, which document the importance of what you have just learnt. Most of the time, these are just interesting, but are seldom applicable to what you will be tested on.

At other times, Warren will spend the last 30 minutes of his lecture going through a full-blown example involving what you have just learnt. This is probably the most informative aspect of his lecturing. These full-blown examples are similar to what may appear on the exam, so being able to go through this with Warren is extremely useful. Whether you attend the lecture, or watch it at home, you should probably watch these examples. This is especially true for the cash flow statement construction, which appears around Weeks 10–11.

Tutorials

As 5% of your score will be based off tutorial attendance, it is highly recommended that you go to these.

Be warned, the written tutorial assessments (or assignments) are trickier than what you expect. To obtain a full score of 10/10, you were expected to elaborate in greater detail than what was taught in lectures. Personally, ARA knowledge will help you with this more than you would expect.

You will be given a lot of pre-tutorial questions to go through (more than other subjects from what I've seen), and your tutor should go through the important ones in class.

This is extremely good, as if you are receiving around 10–15 tute questions per week, it means you have a lot to study and revise in preparation for the exam. For my revision, I redid most of the tutorial questions, as they were extremely useful.

Generally, (for the 2015 cohort) tutors were pretty good, and as the subject isn't too hard, their explanations were usually quite simple and easy to process.

Assignments

Note that Warren did not actually give us written assignments, they were online WileyPlus assignments. Basically these are online tests that you have to complete in one sitting. These had a combined worth of 25%, which is quite a lot for some online tests. In fact, I am pretty sure Warren himself stated that **you were allowed to work together on these assessments**, and work together we did. Some of the numbers may change between different tests, so be careful of this.

1. The first test covers the first 3–4 weeks of content and was quite basic. So long as your internet did not crash, you could easily receive full marks. This was especially true as if you answered a question wrong, you were given a second chance.
2. The second test was met with much more negative reception. It had covered the rest of the weeks, and was significantly harder than the initial one. Furthermore, as Warren had learnt from his mistake and made it a 1-try-only test, if you got it wrong, you could not try again. It is highly advised that individuals work together, as this one will be tough.

End-of-semester exam

Warning, the exam is trickier than the content.

You are provided a cheat sheet with all the ratios on DuPont analysis (a way of breaking down return on equity). This means there are a lot of ratios that you do not have to memorise.

You are given 3–4 practice exams, which is plenty (compared to ARA). However, these are extremely deceptive in terms of difficulty—we'll come back to Warren's mischief soon enough.

Personally, I don't remember memorising any ratios at all. Warren is the type of lecturer who won't dog you on having to do a lot of grunt work; he'll try to make you elaborate on what you have learnt, instead of mindlessly crunching numbers.

So what did Warren do to the 2015 Semester 2 IFA exam? He made it a lot harder than the Semester 1 exam, which caught a lot of us off guard. Be prepared to face an exam that may be tougher than what you are expecting and what you have learnt, as what you learnt barely covers the detail he wants you to attain.

Breakdown There were 10 multiple-choice questions (worth 1 mark each), 40 marks on practical questions, and 50 marks on theory questions!!! Hang on a minute, if most of what we learnt was practical, why is half the exam theory? Thanks Warren, you've trolled us again!

- Some multiple-choice questions (not many, around 10).

- Short answer, where you write what you believe is your response to certain accounting scenarios, e.g. the typical: when is a gift card recorded as a sale?
- Cash flow statement reconstruction; oh no you better prepare, because this will be 10 marks that could make or break your paper. Definitely practise on this until you don't need to use T-Accounts (basically a breakdown of debits/credits) to reconstruct.
- Theory, theory, theory. ARA really comes in handy; there were questions that were literally asked in ARA.
- Final 10 mark question which was a 2 page extended response on a big accounting issue.

ACTL10001 Introduction to Actuarial Studies

Exemption status	Not an exemption subject, but a great introduction subject which covers the basics of financial mathematics.
Lecturer(s)	Dr Xueyuan (Shane) Wu
Weekly contact hours	2 × 1-hour lectures 1 × 1-hour tutorial
Assessments	2 Microsoft Excel group assignments 2 × 10% 45-minute mid-semester test in Week 8 10% 2-hour end-of-semester exam 70%
Textbook recommendation	Dickson, D.C.M., & Atkinson, M.E. (2011). *An Introduction to Actuarial Studies* (2nd ed.). Cheltenham, UK: Edward Elgar Publishing Ltd. ✓ This book matches the lectures well and provides great extra exercises to solidify your knowledge of each topic. However, some of the working steps to contingencies exercises are presented in a slightly different way to that in the lectures.
Lecture capture	Yes (both audio and video).
Year and semester reviewed	2014 Semester 2

Comments

Subject content

Weeks 1–4 cover financial mathematics: discounting future lump-sum payments and series of payments, valuing debt securities such as treasury bonds and bills, and analysing housing mortgages with interest.

The first assignment is out of 20 marks and tests the first three weeks, which does not include bonds and housing loans. Excel is used to value series of payments with changing payment amounts and changing interest rates more easily.

Weeks 5–7 cover demography: the different population distributions and statistics for undeveloped/emerging/developed countries, survival functions (probability that a person lives till a certain age), and life tables (number of people living in a population for all ages, death rates, survival rates, etc.).

The mid-semester test occurs in Week 8 and tests all material up to and including Week 6. It is out of 35 marks and students are given 45 minutes with no reading time.

Then, in Weeks 8–10, the first seven weeks are combined to learn how contingent payments (future payments that have a probability of not being paid) should be valued. In particular, the valuation of term insurance, whole-life insurance, and endowment insurance are covered. Some information on the specific roles of actuaries working in life insurance is also covered.

The second assignment, again out of 20 marks, is longer than the first assignment and tests everything from Week

This review was previously published in the 2015 edition of the *Actuarial Students' Society Subject Review*.

4 to Week 10.

The last two weeks do not involve any calculations and give students an idea of what actuaries do in areas of insurance other than life insurance, such as general insurance, private health insurance, and superannuation.

Other remarks

Although this subject involves a lot of number crunching, the only mathematical concept that must be learned and applied is summing arithmetic and geometric progressions. The difficulty comes in interpreting the question correctly, as there are multiple factors like interest rates, timing of payments, and changing death rates that must be taken into account, and consequently being able to set up the correct equations. Additionally, many new symbols are introduced for each type of payment and each component of the life table, which take some time to become familiar with. Shane stresses the importance of not simply rote-learning formulas and applying them, but rather being able to derive and prove each one. He often puts one or two proof questions on the MST/exam to test this, and this helps in solving more complicated problems.

During the lectures, Shane is a bit difficult to understand at first because of his accent, but does have a nice logical approach to each exercise presented in the lectures. However, the last two weeks of lectures (which introduce the different types of insurance) are extremely boring as he simply reads blocks of text from the slides.

The tutorials were definitely the worst part of this subject. You are required to attempt the set questions beforehand, with full knowledge of everything covered in the lectures, and then discuss answers during the tutorial. From my experience, the first few weeks' questions were doable, but later on, as the concepts and questions got harder, there were often no attempts at the questions beforehand. Instead of going over the concepts again, my tutor became annoyed and told us to look at lecture slides, only providing the worked solutions for each exercise. This did not add to my understanding of the concepts and was particularly frustrating when it came to the harder topics of life distributions and contingencies.

However, the tutorial problem sets do come with past exam questions for each topic and full solutions to each problem, which when combined with the textbook provides more than enough practice material. Luckily, the exam is easier than the past exam questions given, and adequate time is given to complete the paper (60 marks in 2 hours). Only one specimen exam paper is provided, and no past exams are available.

If you want to keep on top in this subject, I would suggest reading the textbook after every week to ensure that you fully understand each concept. Otherwise, tutorial problems will become hard to do, and even worked solutions will become hard to follow.

Despite its flaws, I think this subject (particularly the last 4 weeks) gives prospective actuaries a very good indication of the types of traditional work done by actuaries, and is structured very well in terms of content.

ECON10003 Introductory Macroeconomics (1)

Exemption status	Not an exemption subject, but is a prerequisite for ECON20001 *Intermediate Macroeconomics* (CT7 *Business Economics* subject).
Lecturer(s)	Dr Graham Richards
Weekly contact hours	2 × 1-hour lectures 1 × 1-hour tutorial
Assessments	Tutorial attendance and participation 10% 2 online multiple-choice tests 10% 2 assignments 2 × 10% 2-hour end-of-semester exam 60%
Textbook recommendation	Bernanke, B., Olekalns, N., & Frank, R.H. (2014). *Principles of Macroeconomics* (4th ed.). North Ryde, AU: McGraw-Hill. The textbook is very detailed and at times convoluted. ✓ It is a great resource for deepening your understanding, or in my case, learning new content when you stop attending lectures. You can probably survive without it, but I would recommend against that.
Lecture capture	Yes (both audio and video).
Year and semester reviewed	2015 Semester 2

Comments

Subject content

Introductory Macroeconomics is an extremely content-heavy subject and often requires quite a lot of reading, because the lecture slides sometimes only briefly gloss over some parts of the subject or are not very clear in their explanations. That being said, it is entirely possible to complete the subject learning from only the lecture slides provided to you by Graham, because most of the questions on the final exam and second assignment (the first assignment is a research assignment) can be rote-learned. However, I do recommend reading the book because it is a helpful resource in completely understanding the content, most of which I found very interesting because it detailed the basics behind the nationwide economy, something which I had previously not really thought about before.

Lectures

If I'm going to be brutally honest, the lectures were boring to the extent that I stopped going to them shortly after the semester started. They aren't necessary. I learned much more from reading the slides, and if I didn't understand something, I would consult my textbook, my tutor at his consultation, or the Online Tutor who also happened to be my tutor. Graham goes on unnecessary tangents most lectures or he tries too hard to appeal to the audience, sometimes by making racist jokes. Otherwise, I found him really dull and it was hard to find any excitement in

learning about macroeconomics when I was at his lectures or listening to them at home.

Beware if your lectures are in the Melbourne School of Design. The lecture theatre has what I find to be the most comfortable lecture seats in all the lecture halls I've been to. Coupled with the fact that the projection of the lecture slides is the main light source in the hall, it creates the ideal conditions for falling asleep.

Tutorials

My tutor was my best friend throughout my studying Introductory Macroeconomics. His tutorials were well-structured and he created his own slides which I found to be much less convoluted and more useful. I did attend my friend's tutorials from time to time, because it came much earlier in the week and I wanted to study new content before the online tests which came before my tutorial in the week. Though the effort he put in paled in comparison to my tutor, the way the new content was taught was largely the same and still helpful in reinforcing the previous week's material. I believe that the tutorials are an extremely useful way to help reinforce what you've learnt and for clearing up anything you didn't understand from the previous week's content, especially if you are like me and stopped attending lectures.

Assignments

The first assignment was annoying to say the least. I found that the assignment question was at times ambiguous and most people interpreted it differently. Not only that, it was research-based, meaning I had to spend hours finding a single reference that was relevant to what I had chosen to research. Fun times.

The second assignment is based on the content from the lectures and the textbook. It's much more straightforward, and, as I said before, you can rote-learn the content required for this assignment, making it pretty easy. Where you might lose marks on is the amount of detail you put into your explanations and conclusions, so I advise caution.

Online Tutor

Coming from someone who had the Online Tutor as his tutor, I can safely say that the Online Tutor is not the same as going to consultations or your tutorial. He told me himself that the Online Tutor is only a tool for confirming your knowledge, not deepening it. The Online Tutor gave very brief answers or even told you to refer to the textbook and lecture slides. During assignments, he would say "it's your judgement call" in response to questions regarding what assignments were asking for.

ECON10003 Introductory Macroeconomics (2)

Exemption status	Not an exemption subject, but is a prerequisite for ECON20001 *Intermediate Macroeconomics* (CT7 *Business Economics* subject).
Lecturer(s)	Dr Graham Richards
Weekly contact hours	2 × 1-hour lectures 1 × 1-hour tutorial
Assessments	Tutorial attendance and participation 10% 2 online multiple-choice tests 10% 2 assignments 2 × 10% 2-hour end-of-semester exam 60%
Textbook recommendation	Bernanke, B., Olekalns, N., & Frank, R.H. (2014). *Principles of Macroeconomics* (4th ed.). North Ryde, AU: McGraw-Hill. ✓ *Principles of Macroeconomics* is available in several editions as a PDF and I would strongly advise procuring an electronic copy of it. The textbook covers content in great detail and does not go off on tangents.
Lecture capture	Yes (both audio and video).
Year and semester reviewed	2015 Semester 2

Comments

This subject is structured similarly its microeconomics counterpart; however, the content that is covered is slightly more challenging and requires much more lateral thought to perform well in.

As with all subjects where non-exam scores are given high weightings, Intro Macro is a subject where assignments should be utilised to give yourself a head start before the exam. With 2 multiple-choice tests and 2 written assignments distributed quite evenly across the 12 weeks, it is essential for you to keep up to date with the subject.

Even though ECON10003 Introductory Macroeconomics is not an exemption subject, it would be advantageous to do well in this subject as it provides a good foundation for ECON20001 *Intermediate Macroeconomics*, which is a CT7 *Business Economics* exemption.

Although the subject itself isn't very hard, the Intro Macro exam is **not** a 'crammable' assessment!! (Ask any smart actuarial student that did the exam in 2015.)

Subject content

In comparison with ECON10004 *Introductory Microeconomics*, Intro Macro covers content that is much more applicable to real-life scenarios and everyday concepts, which makes it slightly more practical and easier to research/study.

Week 1 covers the notion of GDP as a measure of economic growth and methods of measuring and comparing

nations' economic growth, subsumed under the broader classification of national income accounting.

Weeks 2–4 cover more specific topics such as inflation and its measures, the labour market, and savings. These are elaborated upon in great detail; however, they are typically not assessed as heavily as the other topics. (That's not to say they should be skimmed over, as they often serve as secondary points of discussion within broader question and are an opportunity to display comprehensive knowledge).

Week 5 covers the Keynesian model, which is the first time many are exposed to a macroeconomic model. Though very straightforward, understanding the effect of the autonomous multipliers and the ability to derive/explain said multipliers through algebraic manipulation proved problematic for some.

Week 6–7 covered fiscal and monetary policy, explaining effects of policy on inflation as well as exploring the concurrent effects on the economy. It then moves on to cover the AD/AS model, one of the main topics examined in papers.

Weeks 8–10 cover economic growth and growth models, focussing on the Solow–Swan model of economic growth, which has had a guaranteed spot in many historical papers. (Questions on the SS model are generally very standard and are easy marks so mastering the SS model is a worthy investment).

Weeks 11–12 focus on the foreign exchange market, covering the effects of fluctuations in the FX rate on the economy. While the main focus is as stated above, this topic (FX) also includes some other intricate details that might require some time and additional research to understand.

Lectures

These lectures are undoubtedly the most boring you will ever attend in your university life. The 'PowerPoint' presentations—quotation marks because they're more like essays in Microsoft Word than PowerPoint slides—are often 60+ slides of paragraphs of text, some of which are often neglected in lieu of discussions of tangential topics.

Personally, I found lecture attendance unnecessary for this subject and would advise reading through the slides at a leisurely pace, building upon key topics using the textbook and other research.

Watching the lectures on lecture capture can help as sometimes the slides, despite the large slabs of text, fail to explain concepts clearly, but Graham almost always clarifies it verbally.

Tutorials

Tutorial participation constitutes 10% of your grade for this subject, and tutorials should be attended if only for this reason. I found that tutors across the subject were generally well-equipped in terms of knowledge and were always more than happy to answer questions whether via email or in consultation hours.

Each week, the tutorials are structured to begin with a discussion of theory covered in the previous lecture before moving on to the pink sheets, which had questions to complete during the tutorial. These pink sheet questions were always of a good standard, and doing them properly is strongly advised. At the end of the tutorial, blue sheets are handed out as preparation for the next topic, and it is suggested that students complete this in their own time. I personally found that many of the blue sheet questions were exactly the same or very similar to pink sheet questions, and I would suggest possibly leaving those to the end and completing them as exam revision (you should still prepare for your tutorials by studying/making notes).

The best advice for Intro Macro tutorials is to engage in discussion as the topics discussed are often very interesting. Apart from scoring some bonus participation marks, you can further your understanding and practise articulating your answers.

Assignments

- 2 multiple-choice quizzes, worth 5% each: these are much harder than you would expect from a multiple-choice quiz, and I would not advocate 'winging' them or trying to use them as a learning experience. Study hard for these and work together with your friends.
- Written assignment 1 (10%): the first assignment is based more upon research than content and would be based upon the first week's content which is National Income Accounting. You are given the discretion to choose your own topics for discussion, so make sure you decide on ones that you are comfortable with, but also consider ones that aren't too basic.
- Written assignment 2 (10%): a tough assignment on monetary policy. My only advice is to spend as much time on it as you can.

End-of-semester exam

Warning! Time constraints.

The Intro Macro exam is notorious for its erratic selection of examinable content. To best prepare for this exam, study **everything** in the subject guide, which is a comprehensive guide to what Intro Macro covers. Past exam solutions provided by Graham have answers which are sometimes pages long. Even though answers of that amount of detail are not expected, the solutions are an indication of how much you can write and, if anything, how broadly you should think when answering a macroeconomics exam question.

The multiple-choice section is a generous concession that is provided to you and is often easy enough to complete in reading time, bar a few that involve arithmetic. The written response section typically does require you to relate your answers in some way to a prompt in the question, so do be aware of that. Also, one would be wise to attempt all the past papers under timed conditions to gauge your ability to complete a 2-hour exam.

Note for all: If you're thinking 'There's no way we need to remember this formula' you're probably wrong.

ECON10004 Introductory Microeconomics

Exemption status	CT7 *Business Economics*, in conjunction with ECON20001 *Intermediate Macroeconomics*. Satisfactory performance in both subjects' end-of-semester exams is needed.
Lecturer(s)	Mr Gareth James
Weekly contact hours	2 × 1-hour lectures 1 × 1-hour tutorial
Assessments	Tutorial attendance and participation 10% Online multiple-choice test 5% 2 assignments 25% 2-hour end-of-semester exam 60%
Textbook recommendation	Gans, J., King, S., Byford, M., & Mankiw, N.G. (2014). *Principles of Microeconomics: Australia and New Zealand Edition* (6th ed.). South Melbourne, AU: Cengage Learning Australia. Borland, J. (2013). *Microeconomics: Case Studies and Applications* (2nd ed.). South Melbourne, AU: Cengage Learning Australia. The prescribed textbooks are useful, but it is possible to do well without them as well. Any edition will do. Get them if you need full sentences to explain what is happening in the graphs and models to help your understanding.
Lecture capture	Yes (both audio and video).
Year and semester reviewed	2015 Semester 1

Comments

Subject content

The subject covers the basic demand and supply model and the effects of different economic conditions on the model and the subsequent equilibrium point. It also covers the concepts of marginal revenue and marginal costs, competition, price determination, and game theory. The concepts are quite interesting, and are easy to understand and master.

Other remarks

Gareth James has a very boring monotone voice, but his slides are good and his accompanying narration is good. He is straight to the point and doesn't overcomplicate things. The textbook is good supporting material which forms the ideas discussed in lectures in full paragraphs, which is very useful if you find the information provided in the slides lacking in detail and explanation. The textbook will fill in all those gaps for you.

At the end of every single tutorial you will get a blue sheet which contains questions covering ideas and concepts that will be discussed in lectures the next week. The intended usage of these sheets assumes that you have

completed textbook readings as recommended, which would allow you to attempt these questions and give a feel of what you are going to be up against, though my personal experience says otherwise. I never really managed to derive the correct way to apply the concepts myself. I always found it more effective for me to just wait for the pink sheets that are given at the start of every tutorial, which contains questions that will be discussed immediately, and be spoon-fed the methodology. How you use these blue and pink sheets will depend heavily on your style of study.

Assignments are relatively easy—questions are straightforward, though it might be time-consuming if you don't know how to draw graphs on your computer quickly. Personally I drew all of the graphs on PowerPoint first and then copied them as images into my report. It was a relatively quick process.

The exam is relatively easy as well. It is the easiest subject in your first year, other than possibly your breadth. Try to get a H1 in this subject to pull up your WAM.

MAST10006 Calculus 2

Exemption status	Not an exemption subject; however, you will need an average of 75 across this subject and MAST10007 *Linear Algebra* to continue the major and enrol in ACTL20001 *Financial Mathematics I*.
Lecturer(s)	Semester 1 Dr Christine Mangelsdorf Dr William Holmes Semester 2 Dr John Banks
Weekly contact hours	3 × 1-hour lectures 1 × 1-hour tutorial
Assessments	4 individual assignments 4 × 5% 3-hour end-of-semester exam 80%
Textbook recommendation	None; the lecture notes are good enough.
Lecture capture	Yes (semester 2 only; both audio and video).
Year and semester reviewed	2015 Semester 1

Comments

Subject content

The subject covers limits, sequences, hyperbolic trigonometry, integral calculus, first and second order differential equations, and functions of two variables.

Other remarks

If you are doing it in Semester 1, GO TO CHRISTINE'S LECTURES. You can enrol in a different stream, BUT GO TO HER LECTURES INSTEAD. She is an absolute gun. Listen to her and you will do fine. The other lecturers in Semester 1 aren't necessarily bad, but she's just too good. The lecturers in Semester 2 are generally not as great.

Do it in Semester 1 because well—Christine.

Expect the pace to be very fast. Every lecture you will be taught a new concept or a new method to solve a question. Follow along with the green question booklet after each lecture to make sure that the ideas are sinking in. It will take a maximum of 30 minutes. The content isn't hard, but the amount of material can overwhelm you if you don't follow along.

There are 4 assignments worth 5% each. These questions are substantially harder than the questions in the lecture notes, so expect to be challenged.

The exam is 3 hours long with 10 questions. You will be pushed for time and expect to finish with only a few minutes to spare. The difficulty of these questions vary but are generally close to assignment difficulty. Do not be deceived

by how easy the questions in the green booklets are—they are only there to solidify ideas and concepts. Expect to encounter new material that would require critical thinking.

Listen to Christine, keep up with the question booklet throughout the semester, do not underestimate the exam, and you will do fine.

MAST10008 Accelerated Mathematics 1

Exemption status	Not an exemption subject; however, you will need an average of 60 across this subject and MAST10009 *Accelerated Mathematics 2* to continue the major and enrol in ACTL20001 *Financial Mathematics I*.
Lecturer(s)	Associate Professor Paul Norbury
Weekly contact hours	4 × 1-hour lectures 1 × 1-hour tutorial 1 × 1-hour MATLAB tutorial
Assessments	Individual assignments 15% MATLAB test 5% 3-hour end-of-semester exam 80%
Textbook recommendation	✓ Make sure to get the yellow workbook on your first day of class. The required text is held in the high usage room of the Eastern Resource Centre (ERC) and is very useful. The lecturer will also make available links in the LMS to some free texts.
Lecture capture	Lecture capture is great. The professor writes all examples on the slides shown in the capture screen. Very useful to review the material at your own speed.
Year and semester reviewed	2014 Semester 1

Comments

Subject content

You will be row-reducing as if your life depended on it. The first few weeks are not so bad; most material will be a review of material you studied in Specialist Maths. Vector spaces, linear transformations, and matrix representations and manipulations will be a large chunk of the material. Around the middle of the course you will take time out to learn a few proofs techniques, such as proof by induction. The course picks up after that and you will be onto wholly new material such as eigenvalues and orthogonal projections. The last few weeks of the course will cover multivariable calculus. You will learn how to do partial derivatives and double integrals.

Positive aspects

The lecturer is interesting and quite friendly. The material is mostly straightforward and there are tons of YouTube videos on just about every topic. The lecture recording is wonderful and I recommend you use it. The material is not so difficult if you can handle the speed it is delivered.

This review was previously published in the 2015 edition of the *Actuarial Students' Society Subject Review*.

Negative aspects

The speed of the course. It is incredibly high-paced. Do not miss more than one lecture in a row or you will be very far behind. There is a lot of material covered in each lecture and the material already covered will not be repeated in future lectures. Although, a personal feeling: MATLAB is not so fun.

Workload

You need to keep up. Make sure you go through the yellow workbook handed out at the beginning of the semester. You must stay on top of the readings or at bare minimum make sure you understand the problems from the workbook. There is no time for revision throughout the semester and topics will be going by quickly. If you fall behind it becomes very difficult to catch up.

MAST10009 Accelerated Mathematics 2

Exemption status	Not an exemption subject; however, you will need an average of 60 across this subject and MAST10008 *Accelerated Mathematics 1* to continue the major and enrol in ACTL20001 *Financial Mathematics I*.
Lecturer(s)	Professor Barry Hughes
Weekly contact hours	4 × 1-hour lectures 1 × 1-hour tutorial
Assessments	2 individual assignments 2 × 5% 45-minute mid-semester test 10% 3-hour end-of-semester exam 80%
Textbook recommendation	✓ I do recommend the printed lecture notes from Co-op. They are essentially the lecture slides, which aren't available anywhere else, and you **will** want copies of the things gone through in lectures.
Lecture capture	Yes (both audio and video).
Year and semester reviewed	2014 Semester 2

Comments

Welcome to AM2. Prepare for the worst.

This subject is pretty much MAST10006 *Calculus 2* and MAST20026 *Real Analysis* combined, with $\frac{5}{9}$ of the contact hours, so the pace is **fast**.

Anyway, I believe AM2 is probably the best taste of pure mathematics you can get in a level 1 subject. This subject is not highly intuitive; at times it seems you are just being thrown abstract facts which together conclude another (perhaps more abstract) fact. I suppose you shouldn't expect any more though, because the results you learn are the fruits of many centuries of work by the brightest of mathematical minds.

Subject content

Real Analysis For the *Real Analysis* portion of the subject, a significant underlying concept is being rigorous—if you want to state something, you prove it from basic definitions (most of the time). Granted, doing well in assessments doesn't require being good at this, because you'll probably be reproducing familiar proofs or processes anyway.

Decimal digits… really don't appear much during the first 3 or 4 weeks of *Real Analysis* lectures. Compared to MAST10008 *Accelerated Mathematics 1* where you might have spent a while row-reducing matrices (requiring a lot of number crunching), you'll spend that time trying to get your head around logical yet abstract arguments and processes.

Impressions towards this subject generally become pretty extreme at this point in time—you'll probably either hate

it to bits (most people), or absolutely love it (aliens). If you have a true appreciation for the logical framework of mathematical results, you may be an alien.

You will learn about the notion of a limit for a sequence and a real-valued function (and fusion-ha—a sequence of real-valued functions), ways to confirm the existence of a limit of a sequence, continuity of a real-valued function, and the Intermediate Value Theorem.

And the order hierarchy. Yes, you **must** know the order hierarchy.

Assessment on this part of the subject revolves around establishing whether limits of sequences or real-valued functions exist and calculating them using the definition of a limit or limit laws (and the order hierarchy). You may be thrown the odd question requiring a proof of one of the simpler limit laws.

Calculus 2 Everyone in the subject breathes a sigh of relief once we begin *Calculus 2* content, because a little of this is familiar ground that you would have trod on to bits in Mathematical Methods and Specialist Mathematics.

Essentially the *Real Analysis* parts before this teach people what a limit actually is, which in Mathematical Methods is not really expanded upon at all. Once you have this idea of what a limit is (hopefully), you can then fully appreciate the origins of differential and integral calculus.

This part of the course is itself split into 5 topics:

1. Differential calculus

   You learn the true meaning of "differentiability" (using the idea of the limit) and some vital theorems, such as the Mean Value Theorem or Taylor's Theorem with Lagrange's Remainder.

2. Integral calculus

   You learn what the integral that you used so much in Mathematical Methods and Specialist Mathematics actually means and some new techniques to integrate.

3. Differential equations

   You learn and use some new techniques to solve differential equations involving first and second derivatives. There are a few application examples which pop up a lot, such as inflow–outflow questions and electric circuits.

4. Improper integrals

   You learn what an improper integral actually is (the limit of a proper integral). In some ways this is similar to the earlier work on limits—you work heavily with confirming the existence of an improper integral using various tests.

5. Infinite series

   Again this is similar to the work on limits. You will be using various tests to see if a series (a sequence in disguise) has a limit, and, of course, you apply this not only to series of real numbers, but also to series of real-valued functions.

Any test for existence of the limit that is introduced during work on improper integrals and infinite series needs to be known **word for word**. Applies for important theorems learnt during any of the 5 topics as well (should be clear which ones are important by the end).

The hardest of the 5 topics are probably improper integrals and infinite series—the hard part being knowing which test to use and how to apply it.

Personally I found learning the *Calculus 2* content less interesting than the *Real Analysis* content, as it was a lot more process oriented in my opinion. But anyway, I'm an alien, so...

Lectures

Not much to say for lectures. Rock up 4 days a week, sit there watching and hearing Barry go through lecture slides and example problems.

AM2 lecture recordings have screen capture, but you won't be able see what's written on the whiteboard if you don't go to lectures.

Should you go to lectures? I think so, because that way you can see Barry doing examples problems in person, and actually copy what he writes from the whiteboard. You miss Barry's spoken comments if you copy them from another person, and sometimes they are quite important to what he is writing.

When Barry writes out solutions to example problems on the whiteboard, generally he is copying it from a sheet he's prepared earlier. He'll still mostly explain whatever he writes on the whiteboard as he writes it though, except in some lectures with so much content that Barry really ends up just copying the solution and slightly neglecting the explanation.

Barry has taught this subject for a number of years. You can guarantee he's the best AM2 lecturer there is, because I don't think there are any other AM2 lecturers.

Yes, Barry has his moments of rambling... Generally on things like "third-year Complex Analysis", "second-year Differential Equations" (a subject he takes), moral, ethical, and philosophical correctness in the context of maths problems, "Calculus 2 students" (lol) and so on... But otherwise Barry is pretty enthusiastic about what he teaches, so if you don't insist that the subject is a piece of crap then you'll probably find lectures bearable at the least.

Tutorials

Your tutorials involve you doing problems, just like pretty much any maths subject. The questions all come from the post-lecture exercises though (which was kind of disappointing after coming from MAST20009 *Vector Calculus* where I got fresh questions in tutorials).

If you can do all the selected questions from the tutorials, that's a pretty good indication that you are on track. The selected questions generally revolve around the core coursework, rather than some of the other questions in the post-lecture exercises which can be more about investigation of a specific part of the theory, or requiring a proof with a certain amount of innovation.

Tutorials begin in the second week.

Assignments

You have 2 assignments for this subject. The first one is purely on *Real Analysis* content, while the second one covers everything up to differential equations.

In my semester of completion, each assignment was marked out of (an astounding) 50, and then scaled to 5% each. Because there were so many marks, the marking scheme was actually quite strict, and tutors try to be more strict in the correction of untimed assessments anyway. For example, in the second assignment, rearranging a differential equation to a certain form described in the lectures was worth 1 mark. It was literally just subtracting a term from both sides of the original equation, but if you didn't write the equation out in the rearranged form, you lost the mark.

The first assignment is noticeably harder, because real analysis requires more rigour in general, and also people take a while to get their heads around this part of the course.

Solutions to each assignment go up on the LMS after they are all corrected.

Mid-semester test

The mid-semester test covers the first 5 weeks of lectures, which is all of *Real Analysis*, and pretty much 1 week of differential calculus (definition of differentiability and the Mean Value Theorem, essentially).

There are no past mid-semester tests available, and I feel like Barry doesn't really adhere to any specific structure when he writes the test anyway.

Know all your theorems and definitions (and variations thereof) up until this point **word for word**. You will be expected to reproduce these, and then apply these.

The mid-semester test is for most people the first piece of timed assessment on something as rigorous as *Real Analysis*, so while the course content probably induces a lot of panic up until this point, the mid-semester test isn't set at a ridiculously high level of difficulty, relatively speaking. The hardest questions will be proofs of some of the more basic results you have encountered up until this point.

Solutions to the mid-semester test go up on the LMS after they are all corrected.

End-of-semester exam

Ho ho, a classic 3-hour maths exam.

The hardest parts, as I may have hinted earlier, are *Real Analysis* content, improper integrals, and infinite series. Everything can be handled quite comfortably with sufficient practice, but with these 3 areas, it will take a lot more practice and possibly some creativity (with improper integrals and infinite series).

Again, know your main theorems, definitions, and tests. You will be expected to reproduce these and then apply these.

There are plenty of past exams available, but there are no answers or solutions. If you do enough of them, you'll notice some of the questions come from post-lecture exercises almost exactly, and I'm not just talking about "evaluate the limit" questions.

Concluding remarks

As mentioned, the pace is fast. VCE mathematics is nothing compared to this (although you may have realised VCE mathematics was nothing compared to AM1 already, too). Even AM1 might be nothing compared to this. You will definitely need high levels concentration in lectures, and it would be good to attempt the post-lecture exercises that accompany the printed lecture notes, too. Unless you've actually done the subject before, I don't envision you can motivate the proofs or processes of absolutely everything (and most likely hardly anything). You will want the practice on questions in post-lecture exercises. There are answers to some of the post-lecture exercises at the back of the printed notes. No solutions are provided though.

The lecture slides are almost identical to your printed lecture notes, so if you need to look up something in the slides, go to your printed notes. (You'll probably be doing this **a lot**.) Anything in the slides but not in the notes is not examined.

Everything snowballs very quickly in this subject, so try to be on top of things; it is very hard to catch up when you're behind.

AM2 is compulsory for most commerce students majoring in Actuarial Studies, so apparently actuarial students make up half the cohort. The other part of the cohort will consist mostly of science students, as all second-year maths subjects and some physics and engineering subjects have MAST10006 *Calculus 2* or AM2 as a prerequisite, I think. Don't quote me on this.

Second-Year Subjects

ACTL20001 Financial Mathematics I

Exemption status	CT1 *Financial Mathematics*, in conjunction with ACTL20002 *Financial Mathematics II*. Satisfactory performance in both subjects' end-of-semester exams is needed.
Lecturer(s)	Professor Daniel Dufresne
Weekly contact hours	2 × 1-hour lectures 1 × 1-hour tutorial
Assessments	Group assignment, due start of Week 5 10% Group assignment, due start of Week 11 10% 45-minute mid-semester test in Week 7 10% 2-hour end-of-semester exam 70%
Textbook recommendation	Fitzherbert, R., & Pitt, D. (2012). *Compound Interest and its applications*. Melbourne, AU: University of Melbourne Custom Book Centre. ✓ Get it for the practice problems.
Lecture capture	None.
Year and semester reviewed	2015 Semester 1

Comments

For context, there is a series of 5 actuarial subjects throughout the undergraduate and honours program under the moniker *Financial Mathematics*. This is the first one, so the content is as basic as it gets. This subject was once dubbed by Mark Joshi (another professor in the Centre) as "financial arithmetic".

Subject content

Throughout this subject, you gain a working knowledge of calculations with interest rates and valuations of cash flows. Problems are vastly of a computational nature, so Mark Joshi is not incorrect.

Various different types of interest rates appear—simple (hooray), compound, forces—in conjunction with different time periods—half-yearly, yearly, quarterly, etc.—and of course nominal or effective quotation. Discount rates (interest rates in reverse, sort of) are studied in the same format. This then leads into becoming familiar with the common actuarial symbols—annuities and accumulations. You will be applying your knowledge with these interest rates and symbols to calculate the present value of general cash flows (aka valuation) and solving equations of value (basically finding the equivalent interest rate at which you would have to invest various amounts at various times in order to produce receipts of various amounts at various times). Here you might encounter interest rates as functions of time, payments that do not happen regularly, payments that are continuous, or payments that are functions of time. For those of you coming from ACTL10001 *Introduction to Actuarial Studies*, nothing probabilistic

occurs in this subject; everything is certain.

After dabbling with the symbols, you move on to the valuation of loan contracts and business projects—an extension or application of sorts of the work you will have just done on valuing cash flows and solving equations of value. You are introduced to loan repayment schedules and flat-rate loan contracts as well as a variety of methods to evaluate business projects through their projected cash flows.

Towards the end, you will be exposed to the properties of various asset types, such as shares, property, bonds, and derivatives. The concepts are non-mathematical here; just rote-learn them. I suspect they are only here to comply with the Institute's syllabus requirements.

How "maths" is this subject? Although the subject is highly computational in nature, there are some noteworthy theoretical results, such as the convergence of the Euler sequence (should not be new, because all of you loved and enjoyed this in AM2, I know) and properties of convex functions. Taylor polynomials pop up from time to time, but it is not as if you constantly need to recall Taylor's theorem with Lagrange's form of the remainder or anything. There are also interesting derivations of results regarding equations of value and continuous cash flows in the textbook; these are not discussed in lectures, however.

At this point I should mention that if you did not study MAST10009 *Accelerated Mathematics 2* to satisfy the pre-requisite requirements for this subject, then you have something extra to learn—Taylor polynomials. Now, somewhat strangely, there is nothing in the handbook which demands the prior study of MAST10009 *Accelerated Mathematics 2*, yet in my semester of completion of this subject, Taylor polynomials were quite common. As Taylor polynomials and Taylor series are not studied in MAST10006 *Calculus 2*, students thereof are left to fend for themselves when it comes to dealing with them. I believe Daniel may have posted some resources on the LMS, but that was it from him.

How "finance" is this subject? Not at all. Apart from the home stretch, where you rote-learn properties of asset types, I recall about 1 finance concept, i.e. something that originated outside of the mathematics and the algebra. Officially, not once do you price financial instruments—all the "pricing" is done under the guise of valuing a series of cash flows. Perhaps you may say that time value of money is an overarching finance concept throughout the whole subject, but that feels a bit tenuous to me.

I should say that the content in Financial Mathematics I caused somewhat of an awkward situation for some students due to its rather significant overlap with the financial mathematics component of ACTL10001 *Introduction to Actuarial Studies*, which most students in this subject will have completed in the preceding semester. Personally I did not feel like I was learning many completely new concepts in lectures; rather, they were somewhat of a prolonged revision session where old content was rehashed and sometimes presented in new ways.

Perhaps it would be beneficial to divert some of your attention towards discount rates—in particular, discount rates quoted nominally, as these are not covered in ACTL10001 *Introduction to Actuarial Studies*. Your investigation of them in this subject is very similar to that of interest rates, but I suppose discount rates themselves are slightly less intuitive. The other concept which is new will be continuous cash flows, but this should not prove overly problematic.

Having also completed ACTL20002 *Financial Mathematics II* (for which this is a prerequisite) at the time of writing, I do not believe I would have struggled immensely transitioning directly from ACTL10001 *Introduction to Actuarial Studies* to ACTL20002 *Financial Mathematics II* in consecutive semesters. I can foresee various logistical issues and opposing opinions with arranging something like this, however, and I shall not go into them here.

Overall, I believe the aim of the subject is to instil into students comfort in dealing with interest rates and the time value of money.

Lectures

I will admit that I did not pay close attention to the lectures due to aforementioned reasons, but the schedule follows the chapter sequence of the textbook. Reading the textbook is not essential if you attend the lectures, however. Had I been braver, I may have risked not actually attending lectures, but as lectures were not recorded at all, I attended as a safeguard.

Lectures follow the rather standard formula of teaching of theory followed by application into example. Everything is on the slides; there is nothing for you to fill in and I do not recall Daniel handwriting anything under the document camera very often, if at all. Also, many of the examples may or may not have been lifted from the textbook.

Lecture slides are made available on the LMS every few topics or so. Occasionally Daniel will expose you to the wonderful world that is LaTeX during a lecture as he corrects or makes adjustments to content on the slides in his usual wry manner. Do not fret if you have made the decision to not attend; he kindly compiles these changes in an errata document on the LMS. Naturally, there will be far fewer things to correct for these slides for future iterations of this subject.

As I have said before, those of you coming from ACTL10001 *Introduction to Actuarial Studies* may find lectures slow-moving, and unfortunately I cannot promise you that it picks up at some point during the semester. I actually remember 4 consecutive lectures where we discussed the definition and properties of real-valued convex functions, but I will give him some credit here; it was one of the few concepts I would consider uniquely new in this subject.

And for those who attend lectures, the other reason Daniel is slow-moving is because his age is somewhere in the centuries. Have some sympathy for a man who has seen it all. (Disclaimer: I am kidding, but he does talk about it as a running joke a lot.)

Tutorials

This. You may forgo all the lecture hours if you are [over]confident from your previous studies in ACTL10001 *Introduction to Actuarial Studies*, but do not skip these.

Perhaps I am a little biased, but, as the content in lectures was not all that fresh, the slightly more investigative turn in the tutorials was very attractive for me.

Sure, some of that computational nature persists in tutorial problem sets, but there is also some investigation and foreshadowing. The computational ones take the form of calculating rates or valuing cash flows etc., while the more entertaining ones require you to find recursive relationships or prove algebraic relationships, generally requiring some ingenuity along the way. The interesting questions only pop up here and there, but that was enough for me. Often I would find myself in a lecture noticing that some particularly result was alluded to back in some earlier tutorial. Combined with the fact that I had an absolutely amazing tutor who had an excellent grasp of many underlying or further mathematical results, I can safely say the tutorial program was the part of this subject which I enjoyed the best.

Generally the tutor will sift through the problems on the tutorial problem sets and provide solutions for you. However, as with many actuarial subjects, the other aspects of the tutorial will be somewhat dependent on the tutor. The tutorial team turns over pretty much every year, so unfortunately it is difficult to gauge the calibre of the tutorial program for future cohorts.

(For the 2016 cohort, I just took a second to glance at your timetable. MY GOODNESS. My condolences to you.)

Also, there is a tutorial in the very first week. Do not forget.

Assignments

In my semester of completion, there were 2 of these, and they were both conducted as group assignments, with 3 to 5 students in each group (so you can despise the assignments in good company).

I really cannot express how out of place these felt in my semester of completion. I am honestly doubtful that Daniel will maintain this style of assignment problems in future iterations of this subject. If he does, then the assignments are **full** of investigation and foreshadowing and are a colossal departure from the usual computational nature of the subject. Of course, that means some of you will not care for it. Others will hate it. Others will hate it with passion. But all of you, or at least someone in each of your groups, will end up doing them because you want those assignment marks. It is sort of weird doing what is essentially a maths assignment as a group, but you will get used to it.

As an example, there was a question which appeared on the assignments which I would consider as needing far more ingenuity than any assignment question I had encountered in MAST10009 *Accelerated Mathematics 2*. I was kicking myself at the end of it, though.

There may be some computations and graphing for which Daniel suggests the use of software, such as Microsoft Excel or SageMath. The assignments only require light use, and if you are uncomfortable graphing with software you are always welcome to draw the graphs by hand.

Each assignment had 40 marks available but was marked out of 35; any "bonus" marks you obtained could be used to compensate for the marks lost on the other assignment that had put you below 35. If you ended up obtaining more than 70 marks across the 2 assignments, the excess over 70 did not become insurance in the mid-semester test or end-of-semester exam.

Many of my peers labelled these assignments as "pure mathematics" assignments, and rightly so—there was very little on these assignments suggesting that the students completing them were actually trying to become actuaries. Perhaps they are a glimpse of what Daniel actually wants to focus on in this subject were it not for the fact that he must write a final exam adhering to the Institute's syllabus requirements (and hence teach accordingly).

Mid-semester test

45 minutes of writing time and 5 minutes of reading time were given.

I believe the test covers up to (and includes) the valuation of continuous cash flows and nothing further.

As with all Actuarial Studies timed assessments, be prepared. You will never know how impossibly hard or surprisingly simple it could turn out to be. In my semester of completion, the test was on the doable side, with one question described by Daniel as "requiring you to think".

The people I talked to were probably not a representative sample, so it is difficult to say whether people found the mid-semester test difficult in general. There was no question where the techniques required had not been extensively covered, i.e. nothing obscure. Unsurprisingly, convexity was examined (I mean, we did spend 4 consecutive lectures talking about it). Taylor polynomials were also examined but purely in the form of a computation of a Taylor polynomial followed by an approximation of the original expression using the polynomial. Other than that, I feel that

the mid-semester was just confirming people's familiarity and comfort with interest rates and valuation of cash flows. (Please see comments in the exam section for more insight on preparation.)

There is a formula sheet with some of the (algebraic) definitions of actuarial symbols—annuities in arrear, annuities in advance, accumulations in arrear, accumulations in advance—and also some of the (algebraic) relationships between interest rates, discount factors, discount rates, and forces of interest. Since you should have been using these formulas non-stop by now, they should be second nature to you, rendering this formula sheet useless.

End-of-semester exam

I can only echo my sentiments about the mid-semester test. The difficulty of the exam will be erratic. In my semester of completion, it was overly simple, and this actually resulted in downwards scaling in the end.

I believe the exam should be largely of a computational nature, again testing your ability to work with interest rates and cash flows.

There is a big gaping trap for students who have come from ACTL10001 *Introduction to Actuarial Studies*. For these students, it is reasonable to become complacent and dismiss the content in this subject as easy, as so much of it has been studied already. However, you must always remain conscious of the fact that the computational nature of the exam and the subject in general does not preclude the possibility that you will be suffocating in the examination hall. Computations may be tedious and mechanical to carry out, but the added element of time pressure in an exam introduces vulnerabilities: if the exam turns out to be excessively long, the speed and elegance of your computations, which are perhaps neglected when you practise on your own, suddenly become a decisive factor in how well you perform on the exam. Speed is generally a high priority for students and is normally addressed through continuous practice. Elegance, on the other hand, is a different matter.

It is difficult to say how one improves elegance of computations. Perhaps you make a small algebraic substitution, and the algebra suddenly becomes minimal and your work is far less prone to error. Perhaps there is a certain relationship between interest rates and discount rates which simplifies the problem immediately. Perhaps separating a series of cash flows into individual parts, each of which is simple to calculate but in union are equivalent to the original, reduces the amount of algebra needed. The ability to make such acute observations is hard to forcibly train, but some day they may prove absolutely pivotal in an exam. I can only suggest that you remain alert throughout the entire subject as you practise on your own; be aware of any little tricks or algebraic identities you may encounter along the way—even shortcuts on your calculator. Sure, the subject is computational; however, that does not mean that the only way to be efficient is to work at breakneck speeds. There is still an art to computations if you know where to look.

ACTL20002 Financial Mathematics II

Exemption status	CT1 *Financial Mathematics*, in conjunction with ACTL20001 *Financial Mathematics I*. Satisfactory performance in both subjects' end-of-semester exams is needed.
Lecturer(s)	Professor Mark Joshi
Weekly contact hours	2 × 1-hour lectures 1 × 1-hour tutorial
Assessments	Microsoft Excel individual assignment, due around Week 6/7 — 10% Microsoft Excel individual assignment, due around Week 10/11 — 10% 45-minute mid-semester test in Week 7 — 10% 2-hour end-of-semester exam — 70%
Textbook recommendation	Fitzherbert, R., & Pitt, D. (2012). *Compound Interest and its applications*. Melbourne, AU: University of Melbourne Custom Book Centre. This is available from Co-op as course notes and covers everything up until Week 9. Course notes for weeks 10–12 are made available on the LMS.
Lecture capture	Yes (both audio and video).
Year and semester reviewed	2015 Semester 2

Comments

Overall, I found this subject more challenging but much more enjoyable and rewarding to complete than ACTL20001 *Financial Mathematics I*.

Subject content

- Pricing financial instruments such as treasury notes, coupon bonds, floating rate notes, and growing dividend streams
- Measures of investment performance
- Duration, volatility, convexity of future cash flows, and their application to immunization of liabilities
- Yield curves
- Different ways to quote rates of interest used in financial markets
- Arbitrage and its use in calculating the value/forward price of forward contracts (including foreign exchange contracts), and put–call parity
- Probability in present value (expected present value) with interest rates, death and default as random variables
- Theoretical and simulation work on series of payments with independently and identically distributed interest rates
- Lognormals and their use in modelling independent and dependent unknown interest rates, both analytically and by simulation
- Time series: white noise process, random walk, auto-regressive and moving-average models, and their applications to the force of interest, both analytically and by simulation

Lectures

Mark Joshi is a switched-on, upfront lecturer who explains concepts logically and concisely whilst always trying to link course content to real-life scenarios, which I personally liked as it made it easier to see how different concepts are linked. The lecture structure is simple: a concept is explained then applied to an example problem. However, these examples are usually of the simplest level; Mark intends for students to understand how the concepts are applied in those examples rather than memorise the steps to solving that particular problem, and tests this by setting original (and often harder) questions in assessments. Hence, it is important to understand definitions of parameters/variables as they are explained in lectures or in the textbook, instead of attempting to determine their definitions from worked examples.

Absorbing all the information discussed in lectures is extremely important, so I highly recommend attending lectures in person and/or watching them attentively in your own time. The whiteboard is rarely used, but completed lecture slides are never distributed so you will need to copy down the algebraic working out for each lecture example.

Tutorials

As with all actuarial subjects, each week has a set of questions which are reviewed in tutorials in the following week. There were two tutors in 2015 Semester 2 with slightly different teaching styles. My tutor spent most of the class reviewing lecture content to reinforce our understanding, often only going through tutorial questions very briefly towards the end. This echoed Mark's emphasis on understanding, especially as some tutorial questions simply involved plugging numbers into formulas derived in the lectures. However, it also meant that harder tutorial problems were not explained in enough detail.

Assignments

My favourite part about this subject was the involvement with Excel. Walkthroughs of bootstrapping and Monte Carlo simulation were done in lectures to test the accuracy of analytical results, and many tutorial problems encouraged the use of Excel. Furthermore, there were two Excel assignments, presented as projects for an analyst working in investments, where students are required to form their own steps to create a working financial model. These assignments present an opportunity for you to independently learn Excel commands such as $\mathrm{VLOOKUP}$, IF, and RAND and gain experience in structuring workbooks.

Mid-semester test

Other assessments include the mid-semester and end-of-semester exams, which were initially daunting due to Mark Joshi's reputation for setting very hard exams. Since all the questions set are original, the exams are harder to study for compared to some other subjects, but Mark usually sets fair exams that are possible to complete in the given time. With that said, some questions require intuitive thinking to solve—using a standard method may be too difficult or take too much time, meaning that if you are not able to see the best method, you are likely to leave the exam unfinished. A specimen exam and the previous year's exam are posted to the LMS, but should only be used to familiarize yourself with exam conditions or to identify gaps in your knowledge; they should not be used as indicators of the actual assessments.

In 2015 Semester 2, the mid-semester consisted of 10 marks and was fairly straightforward, with a median score of 7.5/10. The end-of-semester exam consisted of 70 marks, all requiring numerical answers except for two worded answer questions worth 7 marks each: one being a regurgitation of theory written on lecture slides, the other involved explaining the steps to simulating with Excel.

Tips

In my opinion, lecture content, lecture examples, and tutorial questions are the most important things to revise before exams. If you are struggling to grasp a concept as explained in lectures, the textbook provides an alternate view on some concepts, which I found helpful when studying arbitrage. Furthermore, understanding and remembering concepts learnt in MAST20004 *Probability*, particularly conditional expectation and moment generating functions, will help greatly with the material covered in Weeks 7 to 10.

ECON20001 Intermediate Macroeconomics

Exemption status	CT7 *Business Economics*, in conjunction with ECON10004 *Introductory Microeconomics*. Satisfactory performance in both subjects' end-of-semester exams is needed.
Lecturer(s)	Dr Mei Dong
Weekly contact hours	2 × 1-hour lectures 1 × 1-hour tutorial
Assessments	Tutorial attendance and participation 10% Online multiple-choice test 5% Group assignment, due in Week 7/8 12.5% Group assignment, due in Week 10/11 12.5% 2-hour end-of-semester exam 60%
Textbook recommendation	Blanchard, O., & Sheen, J.R. (2013). *Macroeconomics Australasian Edition*. Frenchs Forest, AU: Pearson Education Australia. Available from Co-op. A few copies are in the library.
Lecture capture	Yes (both audio and video) and is a very good alternative to the actual lecture but is not a substitute.
Year and semester reviewed	2015 Semester 2

Comments

This is a fairly easy subject for actuarial students. Most students should be able to obtain the exemption for this subject.

Subject content

1. Short-run macroeconomics
   - Output, investment, and savings
   - Financial markets; background on the financial crisis
   - IS–LM model
2. Labour markets and unemployment
   - Labour markets, part one: tour of the labour market
   - Labour markets, part two: labour market dynamics and the natural rate of unemployment
3. Macroeconomic adjustment
   - Aggregate demand and aggregate supply
   - Inflation, unemployment, and the Phillips curve
   - Dynamic AS–AD model
   - Macroeconomic policy applications
   - Rules versus discretion in macroeconomic policy making

4. Long-run macroeconomics
    - Economic growth facts
    - Growth theory, part one: Solow[–Swan] model
    - Growth theory, part two: convergence and conditional convergence
    - Growth theory, part three: endogenous growth
    - Productivity and institutions
    - Productivity, wages, and inequality
5. Open-economy macroeconomics
    - Openness in goods and financial markets
    - Interest rates, exchange rates, and output
    - Exchange rate regimes

Lectures

Mei is a very responsible lecturer. She prepares detailed lecture slides and she likes to use the projector a lot to help her explain the different models. She explains each concept very clearly and she gives very useful example questions and detailed solutions to help students understand the concepts. She also makes sure to link each concept so that students can follow easily.

Students are expected to explain the short-term and long-term effects when there is a change in the economy and understand how the graphs for each model works. Therefore it is extremely important that students pay attention when Mei uses the projector and talks about the shifts in different curves.

Each lecture has a repeated session, so if you've missed a lecture you can always go to the repeated session. Otherwise the online recordings are fantastic in terms of picking up every single detail Mei talks about.

Tutorials

Like all the other economics subjects, you will be given a blue sheet and a pink sheet for your tutorials. You are expected to complete or at least attempt the blue sheet before coming to the tutorial. Most tutors will check that you have written something for the blue sheet. With the pink sheet, this is something that tutors will go through after reviewing last week's lectures. Tutors will usually spend the first 15–20 minutes or so reviewing lecture contents and explaining the important formulas and graphs again to ensure students understand the concepts. It is also a good chance for you to ask any questions if you are too shy to ask in lectures. Afterwards, tutors will let you try the pink sheet and also go through the questions on the pink sheet. The pink sheets are a great indication of the difficulty level of the exam. If you are confident with all the questions on the pink sheets, you should be fine. Also, only the solutions for the blue sheets will be posted on the LMS, so it is important to attend tutorials and copy down the solutions for the pink sheets.

Assignments

The online test is a fairly easy multiple-choice test and I would expect most students to get 100% for the test.

The two assignments are done as group assignments. Each group should have no more than three students and all members must belong to the same tutorial. Each group will only submit one single assignment and each member will receive the same mark. The assignment questions will also be practice exam questions and students are expected to use calculations and graphs to explain each question. Students may also be asked to provide spreadsheet as references to the answers.

End-of-semester exam

The final exam consists of three sections each worth 20 marks which gives a full mark of 60. Section A has 12 multiple-choice questions. Section B and C both have three questions and students can choose two questions out of the three to answer for each section. Each question covers a different topic from the course. If students choose to answer all three questions for one section, only the first two questions will be marked.

The exam for 2015 was definitely on the easy side. Most students found Sections B and C fairly easy, but Section A was a little bit more challenging. Practice exams are available on the LMS a few weeks before SWOTVAC and are very helpful. I would suggest you try all the practice exams and make sure that you understand each question. When I say try all the practice exams, I mean to try all three questions from Sections B and C, because you will never know if the topic you decide to do does not show up on the exam or is harder than you think. It is always better to be overprepared than underprepared.

Tips

With the lectures, make sure you attend all the lectures or at least watch the recordings and never fall behind. You should understand all the lecture contents and ask questions or go to consultations if you are unsure of anything. Attend all tutorials if you can, because it does count towards your final result for the course and it is the only way you can get solutions for the pink sheets. As for studying for the exam, I can't stress enough that you understand all the questions on the blue and pink sheets and practice exams. The final exam will not be harder than these questions. If you are confident with these questions then you will be fine. Good luck!

FNCE20001 Business Finance

Exemption status

CT2 *Finance and Financial Reporting*, in conjunction with ACCT10002 *Introductory Financial Accounting*. An average of 73 across this subject and ACCT10002 *Introductory Financial Accounting* is needed, with no fails.

Lecturer(s)

Varies. In 2014, the lecturers were

Summer Semester	Professor Rob Brown
Semester 1	Dr Joshua Shemesh
Semester 2	Dr Vincent Gregoire
	Dr Sturla Fjesme

Weekly contact hours

Summer Semester	2 × 2-hour lectures
	2 × 1-hour lectures
	2 × 1.5-hour tutorials
Semester 1 and 2	2 × 1-hour lectures
	1 × 1-hour tutorial

Assessments

Summer Semester	1-hour mid-semester test, after 2 weeks of class	20%
	3-hour end-of-semester exam	80%
Semester 1 and 2	Tutorial assignments	15%
	1-hour mid-semester test	25%
	2-hour end-of-semester exam	60%

Textbook recommendation

Peirson, G., Brown, R., Easton, S., Howard, P., & Pinder, S. (2012). *Business Finance* (11th ed.). North Ryde, AU: McGraw-Hill.

Quite an expensive buy ($144.95). ✗ The course does not strictly follow the textbook, and hence, in my opinion, the textbook is not a necessary purchase to do well in this subject. Although, it does provide in-depth explanations of the concepts explored (plus other ideas not covered in the course) which are more detailed than lecture content. Overall, it is a good read to complement your studies, particularly if questions requiring explanations are not your strength.

I'd recommend grabbing a cheap second-hand copy (or an earlier edition) if you can, otherwise, don't stress.

Lecture capture

In 2014, lectures were recorded in Semester 1, but not in Semester 2.

Year and semester reviewed

2014 Semester 2

Comments

Subject content

Broadly, the subject matter covered in the course includes:

This review was previously published in the 2015 edition of the *Actuarial Students' Society Subject Review*.

- an introduction to financial mathematics,
- valuing debt and equity securities,
- modern portfolio theory,
- asset pricing models,
- capital market efficiency,
- capital budgeting,
- debt, dividends, and taxes,
- and an introduction to derivative securities.

Other remarks

I really enjoyed Business Finance. Depending on when you complete this subject, actuarial students are often at an advantage, as many topics—such as the introduction to financial mathematics and derivative securities—are covered in other subjects within our major. Business Finance has "less maths" than most of the other subjects in an actuarial major, and is a nice change of pace. This is not a particularly difficult subject, but students are often caught off guard by the amount of explanation-type questions in the final exam.

Commonly, the highlight of the course is the lecture presented by an industry guest speaker. This is an opportunity to get an insight into how financial concepts are applied in the business world, which contextualizes the theory covered during the semester. Past guest speakers have represented organisations such as Bank of America Merrill Lynch and Goldman Sachs.

It is common for actuarial students to take this subject in the summer semester after their first year. While I studied this subject in the second semester of my second year, I did do an elective in the preceding summer semester (ECON20002 *Intermediate Microeconomics*), and I highly recommend completing a summer semester if it fits into your degree. Generally, in a summer semester, you will only be taking one subject, which makes balancing your studies, part-time work and social life really manageable. After completing a summer semester, you will most likely be able to underload in one of the later semesters in your degree, which is particularly useful as the subjects get more difficult and internships/part-time opportunities begin to arise. In the summer semester, Business Finance is taught over a six week period, with four weeks of classes, a one week mid-semester break, and a one week SWOTVAC period.

Actuarial students tend to cope well with the workload in this subject. Weekly tutorial work can be completed in less than an hour, and the assignments can generally be finished in a single sitting. However, it is important not to become complacent while studying Business Finance—it is not enough to only know how to do the calculations. It is important to be able to explain and apply the theory behind the models used, even though this often isn't emphasised in assessment pieces completed early in the semester.

MAST20004 Probability

Exemption status	CT3 *Probability and Mathematical Statistics*, in conjunction with MAST20005 *Statistics*. An average of 73 across this subject and MAST20005 *Statistics* is needed, with no fails.
Lecturer(s)	Dr Nathan Ross
Weekly contact hours	$3 \times$ 1-hour lectures $1 \times$ 1-hour tutorial $1 \times$ 1-hour computer lab session
Assessments	4 individual assignments $4 \times 5\%$ 3-hour end-of-semester exam 80%
Textbook recommendation	Gharamani, S. (2004). *Fundamentals of Probability, with Stochastic Processes* (3rd ed.). Upper Saddle River, US: Pearson Education. ✗ Generally not needed. I never looked over it. The lecture notes are comprehensive.
Lecture capture	Yes (audio and video capture of the document camera).
Year and semester reviewed	2014 Semester 1

Comments

A great comprehensive introduction to probability and its applications. You begin the course working through probability from the grassroots up with axiomatic definitions and proofs. This helps to give an intuitive sense of the course later on when things begin to get slightly mind bending and tricky.

After the first few weeks of basic analysis, Dr Nathan Ross then introduces various popular pdfs (random variable functions) used in probability, working through their applications to real-life scenarios (albeit at a fairly basic level so nobody gets too lost) and also their general properties. After this, the subject introduces how to transform these random variables to make them slightly more useful, and also how you can combine various random variable models which makes for a difficult yet rewarding few lectures. After this, you work through ideas involving probability generating functions and moment generating functions with approximations grounded by (you guessed it) Taylor series!

You learn how to work with sums and convolution integrals as a result and how you can apply these strange things. On top of learning about all these odd concepts and long words, you end the course by learning about stochastic processes/Markov chains which are, put simply, processes with more than one step. Without boring anyone by going into pointless detail, I will say the course is dense with approximately 500 lecture slides. It covers an array of topics, which thus requires consistent study (something I didn't do). While there is a lot of ground covered, generally the exam tends to be similar from year to year and easier than assignments (our year was an exception) and thus attaining an exemption mark is well within reach for a student who puts in a decent amount of work. Overall while most of the content was quite interesting, Dr Nathan Ross tried to make light of some fairly dry topics to help keep us awake during lectures and provide great intuition and insight to help ground some fairly abstract ideas. The tutorials and computer labs are well organised and work in harmony together with the lectures, with the labs helping to consolidate knowledge learned from tutorials through computer applications of probabilistic concepts. This was

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a challenging yet entertaining subject and was very well organised.

MAST20005 Statistics

Exemption status	CT3 *Probability and Mathematical Statistics*, in conjunction with MAST20004 *Probability*. An average of 73 across this subject and MAST20004 *Probability* is needed, with no fails.
Lecturer(s)	Dr Davide Ferrari
Weekly contact hours	3 × 1-hour lectures 1 × 1-hour tutorial 1 × 1-hour computer lab session
Assessments	3 individual assignments 20% 45-minute computer laboratory test 10% 3-hour end-of-semester exam 70%
Textbook recommendation	Hogg, R.V., & Tanis, E.A. (2010). *Probability and Statistical Inference* (8th ed.). Boston, US: Prentice Hall. Lecture notes will suffice but I do recommend purchasing the textbook if you want more practice questions.
Lecture capture	Yes (audio and video).
Year and semester reviewed	2014 Semester 2

Comments

Subject content

This subject is an introduction to statistics. Topics include point estimation, sufficiency, interval estimation, order statistics, regression, Bayesian methods, hypothesis testing and various other tests. The first half of this subject will require you to generate your own estimates whilst the second half will ask you to test statistical hypothesis. Statistics covers a lot of techniques and it is important that you don't just memorise them but understand the ideas and concepts behind them.

Other remarks

Davide is a great lecturer; he pays a lot of attention to feedback and tries to cater his lectures to suit his students. During the exam period he also held a 3-hour exam revision lecture where he thoroughly went through past papers and gave students the opportunity to ask any questions. He is also quite witty at times, cracking statistics-related jokes which were quite funny.

What I enjoyed most about the subject was the computer labs. It showed us how to use modern statistical software (R and Maple16) to solve real-life applications. The laboratory test was held in Week 9. The questions were very similar to the ones given in previous weeks' computer lab worksheets, so as long as you know how to do them

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you'll be fine. We were also allowed to bring in our lab worksheets and 5 pages of formulas so there is no need to memorise computer code.

The assignments were not difficult and Davide encourages discussion with fellow students. Another reason to purchase the textbook is that some assignment questions were extracted from the textbook. The exam was also not too difficult and similar to previous ones. We were given 3 past exam papers with solutions. Davide also went through them in the last few lectures.

The only negative aspect of this subject was that I felt it was a bit rushed towards the end. It would have helped the students' understanding if the final topics were discussed more in-depth.

This subject is very content-heavy and hard work is required to not fall behind. I recommend doing at least some of the tutorial questions beforehand, as we never finished all the questions in tutorials. There are also a lot of formulas. Please do not only memorise them; try to understand the ideas behind them also.

MGMT20001 Organisational Behaviour

Exemption status	None.
Lecturer(s)	Professor Graham Sewell Dr Angela McCabe
Weekly contact hours	1 × 1-hour lecture 1 × 1-hour tutorial 1 × (approximately) 1-hour online tutorial
Assessments	Tutorial attendance and participation 10% Individual assignment of 1000 words, due in Week 4 10% Group assignment of 5000 words, due in Week 9 30% 2-hour end-of-semester exam 50%
Textbook recommendation	Department of Management and Marketing. (2011). *Organisational Behaviour* (5th ed.). Sydney, AU: Pearson Choices. All of the assessable material in this unit will be covered in lectures and tutorials, so the textbook serves mainly as an enrichment tool.
Lecture capture	Yes (both audio and video).
Year and semester reviewed	2015 Semester 2

Comments

Subject content

- Weeks 1–6: Micro Theories

  We look at studies on the impact of individuals and small groups on the behaviour within organisations, taking a psychological perspective on analyses.

  The theories covered in the first six weeks are

  - principles of management;
  - perception, attribution, and decision-making;
  - group dynamics, teams, and team leadership;
  - values, attitudes, and work behaviour;
  - motivation in organisations;
  - and understanding conflict in organisations.

- Weeks 7–12: Macro Theories

  These theories take a more sociological, political, and cultural perspective on organisational structures as a whole and how they affect the behaviour within organisations.

  The theories covered in the latter six weeks are

  - Change

- Communication
- Culture
- Power
- Strategy
- Structure

Lectures

The OB staff ran 1-hour lectures in Semester 2 of 2015 instead of their usual 2-hour lectures (as in Semester 1) for the first time. As a result, lectures were easier to sit through but were very content-dense and rushed. A few slides had to be skipped here and there in order to finish on time. Regardless of the drawbacks, the lectures were well delivered by Graham and Angela.

Tutorials

The online pre-tutorial work is great for applying the ideas you have learned in lectures and allow you to partake in richer and more involved discussions in class.

Tutorials are very helpful for learning and understanding the unit material. You're given a brief review of the previous week's lecture before going into either class or small group discussions about the pre-tutorial and tutorial work. The in-class exercises enable very detailed and comprehensive discussions to take place and are a great opportunity to fill in any gaps in understanding you may have had and also to deepen your OB proficiency.

You will form your groups for the group assignment early on from the students in your tutorial class. Subsequent tutorials offer you ample opportunity to get to know your team and smooth out any rough patches you may have, which will prove to be vital, should you desire to be a part of a high functioning and collaborative team. Tutors give out handy assignment and exam tips in class but, however, do not provide any answers to the answers you must answer in your assignments. Both online pre-tutorial work and in-class tutorial participation are graded. Tutors will consider your attendance as well as the quantity and quality of your answers provided online and in-class.

Assignments

The individual assignment is a 1000-word essay that tests your knowledge of a micro topic (has generally been scientific management vs human relations) and requires you to apply it to a case study through analysing the scenario and then providing recommendations on improvements.

This is a fairly easy assignment, since very little content is required for its completion. The task requires you to support your answers with reference to peer-reviewed journals, which seems like a daunting task; however you will be guided through the referencing requirements and be given advice by the OB teaching team in a workshop. If you're unable to attend the workshop, a comprehensive set of slides will be uploaded to the LMS for you to download.

The group assignment is a 5000-word essay that requires you to analyse a case study using models within the micro topics. Your team is selected by a program that aims to diversify your team as much as possible. The assignment requires a lot of time to be invested into researching peer-reviewed articles to support your arguments. The key to

a successful result is to maintain a flow of communication between team members and to manage your time well in order to avoid pulling late nights come submission due date.

End-of-semester exam

The end-of-semester 2-hour exam is worth half your final grade. The exam marks are divided uniformly between four questions. You will not be allowed to bring in any extra materials into the exam; however, you are allowed to annotate the question booklet during reading time.

The first question will require you to reflect on your group work experiences from your tutorials and team assignments and analyse them using one of the micro topics. Your reflection journal will come in handy here. The following three questions will be based on a combination of one case study and one macro topic, which will not be a pair you have already studied in your tutorial classes.

Overall, it will be a straightforward exam, provided that you put in the time and effort to study your topics and cases properly. You will have less to cram during SWOTVAC if you read the cases during the teaching period of the semester.

Third-Year Subjects

ACTL30001 Actuarial Modelling I

Exemption status	CT4 *Models*, in conjunction with ACTL30002 *Actuarial Modelling II*. Satisfactory performance in both subjects' end-of-semester exams is needed.
Lecturer(s)	Professor David Dickson
Weekly contact hours	2 × 1-hour lectures 1 × 1-hour tutorial There is a third lecture time scheduled for every third Friday, but this was only used once or twice in our year.
Assessments	Group assignment, due in Week 4 10% Group assignment, due in Week 10 10% 2-hour end-of-semester exam 80%
Textbook recommendation	Dickson, D.C.M., Hardy, M.R., & Waters, H.R. (2013). *Actuarial Mathematics for Life Contingent Risks* (2nd ed.). Cambridge, UK: Cambridge University Press. Only three chapters of this book are covered in this subject, but the book also covers some material that is useful for ACTL30003 *Contingencies*. The practice problems provided are fairly sufficient though, so the textbook is not necessary but is good if you like extra practice.
Lecture capture	None.
Year and semester reviewed	2015 Semester 1

Comments

Subject content

The subject mainly deals with different methods of modelling mortality. The topics covered are:

1. Modelling mortality: Repeats life probability topics covered in ACTL10001 *Introduction to Actuarial Studies* plus introduces the concept of fractional age assumptions.
2. Non-parametric methods: Introduces censoring and ways to deal with censoring when modelling rates of decrement.
3. Estimating mortality rates: Outlines different models for mortality such as the two-state Markov model, the binomial model, and the Poisson model.
4. Multiple-state models: Introduces models where there are more than just two states (dead and alive). That is, illness, retirement, marriage etc. could also be considered as different states in a model.

5. The Poisson process: Brief introduction to properties of the Poisson process.
6. Simulation: Overview of how to simulate data from some of the previous models studied.

Lectures

Professor Dickson makes very comprehensive lecture notes with blanks for solutions to most exercises, and he uploads the next topic usually a week or so in advance. He follows these notes during lectures and fills in the blanks for exercises using the projector. None of this is recorded, so it is best to attend lectures so you can find out the solutions to these problems. There are a number of proofs that you will see in lectures that make absolutely no sense the first time round; however, if you read over them multiple times after the lecture, you will be able to see the logic behind them. Otherwise, lectures are generally a good pace and fairly understandable.

Tutorials

The tutorials for this subject are very well run and definitely worth attending (especially since attendance is taken at every tutorial, so it is highly unlikely they will let you go to a tutorial you are not enrolled in).

At the end of each week, a problem sheet is uploaded on the LMS. This is usually best done before the tutorial the next week as it gives you an idea of the sorts of problems that relate to the material just covered in lectures. A lot of these problems are quite difficult and require a lot of thought, but the worked solutions provided are generally very clear.

During tutorials, a new sheet of problems is provided. Students are split into teams and each team is assigned a problem to work on for around 20–30 minutes. At the end of this, one member from each team must present their solution to the problem to the rest of the class. Although this may sound daunting, the tutorials were probably the most useful tutorials I have attended, and you get to actually talk to other actuarial students.

Assignments

The assignment groups for this subject, like with most third-year subjects, are assigned based on marks in second-year actuarial subjects. The assignments require students to tackle more practical problems, instead of standard number crunching, and because these assignments have no unique solution, they generally require a lot of time and effort. It is also a good idea to have someone in your group who knows how to use LaTeX, or, if you don't have anyone, then someone should learn it, because Professor Dickson likes assignments to be typed using LaTeX.

Assignment 1 required students to estimate the complete expectation of life at age 90 based on a given life table. Both a Microsoft Excel spreadsheet and a PDF document explaining your derivation method were required for submission. The assignment really came down to having a well-justified method for extrapolation of l_x values as well as a method for numerical integration.

Assignment 2 required students to write an exam question on a particular topic. Each group was assigned a section of the course off which their problem was to be based. A worked solution, marking scheme, and an assessment of the difficulty of the problem were also required.

End-of-semester exam

The final exam, like with most actuarial exams, relies a lot on efficiency. Most problems resemble problems that have been done before in tutorials or problem sheets. However, being a two-hour exam, there is significant time pressure, so you should definitely practise derivations like deriving the Kolmogorov equation for different scenarios over and over again until it becomes second nature.

ACTL30002 Actuarial Modelling II

Exemption status	CT4 *Models*, in conjunction with ACTL30001 *Actuarial Modelling I*. Satisfactory performance in both subjects' end-of-semester exams is needed.
Lecturer(s)	Dr Enrique Calderin
Weekly contact hours	2 × 1-hour lectures 1 × 1-hour tutorial
Assessments	2 group assignments 2 × 10% 2-hour end-of-semester exam 80% An additional 1-hour optional class test is held approximately twice during the semester.
Textbook recommendation	A workbook is available from the Co-op bookshop. ✓ It is the only text for the subject and essential to buy. It includes lecture notes, tutorial questions, progress check questions, and a specimen exam.
Lecture capture	None.
Year and semester reviewed	2014 Semester 1

Comments

Subject content

This subject is essentially a study of mortality rates. It covers the estimation of mortality rates, the accuracy of these estimates, and then graduation, which is the process of smoothing out mortality rates. The final unit is not related to mortality rate modelling, but instead covers an introduction to discrete time Markov chains.

Topics covered during the semester include:

- Exposed-to-risk methods
  - Estimation of mortality rates from crude data
  - Concept of rate interval
  - Mortality investigation
- Hypothesis testing
  - Various statistical tests to assess whether published life tables agree with the mortality experience of a life office
- Methods of graduation
  - Whittaker-Henderson
  - Graphical
  - Mathematical formula
  - Standard table

This review was previously published in the 2015 edition of the *Actuarial Students' Society Subject Review*.

  - Cubic splines
- Markov chains
  - Classification states
  - Equilibrium distributions
  - Application to no-claim discount systems

Other remarks

This subject builds upon knowledge from MAST20005 *Statistics* and introduces a number of interesting actuarial techniques which are used widely. The concepts of exposed-to-risk, mortality modelling, and graduation are some of the fundamental techniques behind life insurance work.

The workbook is quite poorly presented in terms of layout. Key definitions and formulas are not laid out very well at all. However, the lectures are very clear and concise, and hence these are a better guide in terms of preparing notes.

The first unit of this course is quite challenging, and so it is important to grasp the definitions of the concepts outlined, especially concerning rate intervals. The calculations are quite simple to complete once the wordy definitions are understood. The rest of the course is quite straightforward; it is a matter of learning some statistical tests and applying basic knowledge already developed in MAST20005 *Statistics*.

Assignments are in a group format; groups will be allocated by the lecturer. They cover an in-depth investigation into topics covered during the semester. Microsoft Excel is the software mainly used and is a good introduction into working with life insurance data.

The tutorial problems are very useful in terms of enhancing understanding of the subject. The optional class tests and progress check questions provide a good opportunity to assess progress in the subject. Personally, I would recommend leaving the progress check questions until SWOTVAC when you are doing revision of all the topics, rather than just doing the specimen exam as exam practice.

ACTL30003 Contingencies

Exemption status	CT5 *Contingencies*. Satisfactory performance in this subject's end-of-semester exam is needed.
Lecturer(s)	Dr Ping Chen
Weekly contact hours	2 × 2-hour lectures 2 × 1-hour tutorials There are 2 extra hours of lectures in the first week.
Assessments	Group assignment 20% 3-hour end-of-semester exam 80%
Textbook recommendation	Dickson, D.C.M., Hardy, M.R., & Waters, H.R. (2013). *Actuarial Mathematics for Life Contingent Risks* (2nd ed.). Cambridge, UK: Cambridge University Press. ✗ The textbook won't be necessary. ✓ However, the course notes, which are available at the Co-op bookshop, will come in handy.
Lecture capture	None.
Year and semester reviewed	2014 Semester 2

Comments

This is a life insurance subject which essentially combines EPV and survival probabilities. Most calculations relate to calculating premiums and reserves.

Positive aspects

This subject has almost no theory; basically all questions are calculations. This may be a positive or negative aspect. It can make the subject repetitive but simpler to study for.

Combining EPV and survival probabilities gives the subject a more realistic feel, providing more of a purpose to the questions. It is also rewarding to combine your previous knowledge.

Negative aspects

The subject is very formulaic. Almost every question could be done with a formula. This can make the subject a bit dry and tedious at times.

The questions can be frustrating due to their length and the need for attention to detail. One simple mistake or oversight in lines of working can make your answer completely wrong. It is important to make sure every aspect of

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the question is addressed.

Difficulty

This is definitely not an easy subject, as to be expected in third year. However, the categorisation as a double subject and overload of information in the first couple of weeks should not overwhelm you. There are probably a hundred or so formulas, but many of these are variations of the others and can be derived quite logically with little working. The trick is to think through the formulas and not simply memorise them all. If you have understood the previous actuarial subjects (mainly ACTL20001 *Financial Mathematics I*, ACTL20002 *Financial Mathematics II*, and ACTL30001 *Actuarial Modelling I*) and work hard then you will be fine.

The project is similar. It is difficult and you must work well with your group but it is not that hard to do well. Try to be on top of this as soon as it comes out. It does not take that long to answer but writing up the report will. Note that there are no lectures in the last two weeks for this subject so you should be able to organise yourself to have enough time.

Workload

As this is a double subject, the workload is quite high. Each tutorial is long and will take 2–3 hours to complete. It would be ideal to go over each tutorial after and continually revise the material as well. There is a lot of material to cover, so staying up to date is very important as the semester progresses.

ACTL30004 Actuarial Statistics

Exemption status	CT6 *Statistical Methods*, in conjunction with ACTL40002 *Risk Theory I*. Satisfactory performance in this subject's end-of-semester exam and a satisfactory final grade in ACTL40002 *Risk Theory I* are required.
Lecturer(s)	Dr Enrique Calderin
Weekly contact hours	2 × 1-hour lectures 1 × 1-hour tutorial
Assessments	2 group assignments 2 × 10% 2-hour end-of-semester exam 80% An additional 1-hour optional class test is held approximately four times during the semester.
Textbook recommendation	A workbook is available from the bookshop. This includes lecture notes, tutorial questions, progress check questions and a specimen exam. ✓ This workbook is inexpensive to purchase and is essential for the subject.
Lecture capture	None.
Year and semester reviewed	2014 Semester 2

Comments

Subject content

This subject covers the actuarial application of statistical models, particularly in a general insurance context. The course covers maximum likelihood estimation, generalised linear models, simulation, outstanding claims provisions, no-claim discount systems, and time series analysis. Use of R and Microsoft Excel is required for tutorial work and assignments.

Other remarks

This subject built upon knowledge from ACTL30002 *Actuarial Modelling II* and MAST20005 *Statistics* and also introduced a number of interesting actuarial techniques, mainly applicable in a general insurance context.

Tutorials were very helpful in consolidating our understanding of key concepts. There was also a good variety of tutorial problems to work through. Progress check questions included in the subject workbook and the additional class tests (held approximately four times during the semester) are useful self-assessment tools.

Assignments are in a group format; groups will be allocated by the lecturer. Questions will tend to include components that require the use of R and Excel.

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Tutorial problems, progress check questions, class tests, and the specimen exam provided in the workbook cover a wide range of questions and are highly useful revision tools for the final examination.

ACTL30005 Models for Insurance and Finance

Exemption status	Not an exemption subject, but is a prerequisite for ACTL40004 *Advanced Financial Mathematics I* and prepares students for ACTL40002 *Risk Theory I* (CT8 *Financial Economics* and CT6 *Statistical Methods* subjects respectively).
Lecturer(s)	Professor Daniel Dufresne
Weekly contact hours	$3 \times$ 1-hour lectures The final lecture is run like a tutorial where exercises are solved with the entire class.
Assessments	2 group assignments $2 \times 10\%$ 2-hour end-of-semester exam 80%
Textbook recommendation	There is no prescribed text for this subject. Lecture notes and exercises are provided weekly.
Lecture capture	None.
Year and semester reviewed	2014 Semester 2

Comments

Subject content

This subject aims to provide an introduction to the concepts that will be essential to understanding risk theory and derivative pricing. It covers some probability theory as well as an introduction to Brownian motion and stochastic calculus. Topics covered during the semester were:

- Probability spaces, random variables, simulation, and expectations
- Conditional expectations
- Convergence in distribution and in probability
- Random walks and mean reversion
- Brownian motion
- Stochastic calculus
- Martingales

Other remarks

This subject is one of the most conceptually demanding subjects in the actuarial course. The lecturer, Daniel, is quite engaging which helps because the content is quite difficult. The lecture notes are presented in a manner which is quite unlike many other actuarial subjects because there is quite a bit of text included. The language and definitions are extremely important to grasp and understand from a very early stage.

The key to this subject is a thorough understanding of the material. You cannot simply rote-learn techniques as is

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the case with many other actuarial/maths subjects but you must have a deep understanding of the concepts. Once this happens, the problems become quite easy to solve but without this deep understanding it can be quite a difficult subject.

One issue with this subject is the lack of available questions to practise. There are not a lot of tutorial problems and in some weeks there are no tutorial problems at all because the lecture/tutorial is used to go through the assignment. Another issue is that the tutorial problems are not very similar to the exam questions; hence the practice exams are vital in terms of exam preparation.

Assignments are conducted in group format, where students can decide the groups. These assignments are similar to tutorials in the level of difficulty and are harder than the questions presented on the exam.

I would highly recommend forming a group to study together for this subject. Generally, actuarial students don't prefer this, but it is highly beneficial to discuss the abstract concepts covered in this subject with someone else. This will be particularly necessary when preparing for the exam, because the lecturer doesn't make the practice exam solutions available for some reason.

ACTL30006 Financial Mathematics III

Exemption status	CT8 *Financial Economics*, in conjunction with ACTL40004 *Advanced Financial Mathematics I*. Satisfactory performance in the end-of-semester exam of this subject and satisfactory performance in the mid-semester test and end-of-semester exam of ACTL40004 *Advanced Financial Mathematics I* are required.
Lecturer(s)	Dr Jane Paterson
Weekly contact hours	2 × 1-hour lectures 1 × 1-hour tutorial There is an additional third problem-solving lecture every third week.
Assessments	Individual assignment, due in Week 6 10% Individual assignment, due in Week 12 10% 2-hour end-of-semester exam 80%
Textbook recommendation	Joshi, M.S., & Paterson, J.M. (2013). *Introduction to Mathematical Portfolio Theory*. Cambridge, UK: Cambridge University Press. ✓ The lectures exactly follow the textbook, but the textbook has good practice problems, which are used in tutorials, so definitely worth purchasing.
Lecture capture	Yes (both audio and video).
Year and semester reviewed	2015 Semester 1

Comments

Subject content

This subject builds a lot on some of the content covered in FNCE20001 *Business Finance*. You see a return of the efficient frontier, single- and multi-factor models, arbitrage pricing theory, efficient market hypothesis, and CAPM, but there is a lot more of a focus on the theory and mathematics behind these concepts than just how to apply them. Other topics covered include utility theory, the Gram–Schmidt algorithm, stochastic dominance, and the lognormal model for stock prices.

Ultimately, the subject comes down to understanding how we can compare investments and, for each of these methods of comparison, understanding whether they rely heavily on assumptions about stock returns or assumptions about investor behaviour.

Lectures

The lectures in this subject follow the textbook directly. There are some fun interactive lectures about risk behaviour (which highlight how risk-averse actuarial students are), but most lectures are fairly theoretical and focus on exploring the derivation of different models.

Every third Friday there was an additional lecture. Some of these lectures were used as problem-solving classes, and some were used as general Q&A sessions where you could send in emails during the week that you wanted answered in the Friday session.

Tutorials

The tutorial problems for this subject come directly from the textbook. The textbook contains fairly comprehensive worked solutions for its problems, and thus many felt that tutorials did not add much value to this subject.

Assignments

The assignments in this subject closely resemble the style of assignments in ACTL20001 *Financial Mathematics I* and ACTL20002 *Financial Mathematics II* in 2014 where you were required to create live spreadsheets.

In 2015, the first assignment required us to build a model to find portfolios on the efficient frontier. We were given 5 assets and returns were based on a two-factor model.

In the second assignment, we were given five different groups of potential investors with different investing behaviours: risk-neutral investors, long-term investors, investors with constant absolute risk aversion, investors with constant relative risk aversion, and investors with increasing absolute and relative risk aversion. Based on a given set of inputs, you had to determine how each group of investors would rank three different portfolios.

End-of-semester exam

The exams for this subject are very tough and are quite different to the problems asked in the textbook. You will find they require a far deeper understanding of concepts in the course and the ability to adapt existing methods because some of the familiar methods used for solving problems may no longer be applicable. For example, finding the minimum variance portfolio when given a covariance matrix is a fairly standard process that is carried out many times in textbook problems. However, in our exam, the matrix was not invertible, meaning the standard method for solving this type of problem could no longer be utilised.

Also, looking at past papers, you also find that the structure of the exam is always the same. It is always 8 questions worth 10 marks each. However, this does not mean you always need to write the same amount for each question. For most questions, there is a very "simple" way to solve it, whereby you only need a few lines of working or explanation, and then there is a more convoluted way to solve it. Working out the simple way will save you a lot of time. You will also find that in all the past papers, there is always one question that is more qualitative in nature, such as discussing market efficiency or comparing standard CAPM with two-factor CAPM.

Honours-Year Subjects

ACTL40002 Risk Theory I

Exemption status	Completion of this subject and ACTL30004 *Actuarial Statistics* with satisfactory performance across both will lead to exemption from professional exam CT6 *Statistical Methods*. **NB:** Unlike previously, the mid-semester exam for ACTL40002 Risk Theory I will form part of the contribution to the exemption.
Lecturer(s)	Weeks 1–6 Professor David Dickson Weeks 7–12 Associate Professor Shuanming Li
Weekly contact hours	3 × 1-hour lectures
Assessments	50-minute mid-semester exam 20% 2-hour end-of-semester exam 80%
Textbook recommendation	Dickson, D.C.M. (2005). *Insurance Risk and Ruin*. Cambridge, UK: Cambridge University Press. Offers, alongside six tutorials and eleven problem sets, additional practice problems for the first three topics.
Lecture capture	None.
Year and semester reviewed	2015 Semester 1

Comments

Colloquially referred to as RT1, this subject will in almost every instance form part of the standard course of an actuarial student. In essence, most, if not all, of RT1 focusses on applications of probability and statistics to actuarial science: in particular, claim distributions and claim frequencies. Previous success in the second-year mathematics subjects will be an advantage I think but the overall strength of one's mathematical ability might dictate how one performs here. It isn't spectacularly mathematical, in the sense that the concepts are not astronomically difficult to grasp, but it might be commonly regarded as such. An observation supporting this view is that proofs are, quite literally, scattered everywhere throughout the course.

Subject content

Six main topics are studied in RT1, to varying degrees of length. David will take the first two in the first six weeks and Shuanming will take the final four in the final six weeks.

- Probability distributions
- Collective risk model
- Individual risk model
- Bayesian statistics

- Credibility theory
- Ruin theory

Probability distributions First topic of the subject is essentially revision of basic probability. We revisit moment generating functions, probability generating functions, expectations, as well as important discrete and continuous distributions (all but the Weibull will be familiar). Overall, the new material really begins with the convolution distribution of identically distributed random variables, where we study (pardon the incoming jargon) the recursive method of deriving the probability mass function of the n-fold convolution of a discrete random variable with support on the non-negative integers with itself. Perhaps more important than the result itself is the proof; it will make **numerous** appearances in the subject (taking various forms) and it is crucial that you learn and become familiar with the reasoning behind the proof (it could be said that it amounts somewhat to algebraic manipulation of products of infinite sums). Methods of estimation are then briefly covered, adding a statistical element, but I would still argue that the majority of the topic is dedicated to the convolution recursion.

Collective risk model Following an extension of the above, we look at compound distributions; the n-fold convolution is the sum of n independent and identically distributed (IID in the sequel) random variables. In the case of compound distributions, n is not a fixed integer but is in itself also a random variable, usually denoted by N; this generalisation serves as a mathematical abstraction of general insurance where the number of claims over a period (say, a year) is a random variable and the size of each claim are IID copies of some random variable. (Strictly speaking, the n-fold convolution is a compound distribution, with the counting distribution, that is N, being the degenerate random variable at n, also known as the Dirac mass concentrated at n, but this is the trivial case.)

Having made that introduction into the basic idea at hand, I'll continue. Basic results of general compound distributions with arbitrary counting distributions are shown before we study the compound Poisson distribution, i.e. one in which the counting distribution is Poisson. It is studied rather heavily because it possesses some nice properties (e.g. convolutions of compound Poisson distributions are compound Poisson also). Moreover, recursion makes another appearance here (called the Panjer recursion), giving the probability mass function by way of recursion and allowing higher moments (you might have realised immediately that the first two moments are trivial by way of the law of iterated expectations and law of total variance) to be written down.

In the next and final subtopic, we look at certain classes of probability distributions with particular properties. Proofs dominate, and the number you will have to digest and memorise will be, I think, overwhelming. Recursions for these specific classes also exist and will be examined deeply; they all rely on the same concept, simply applied differently. From memory, you will be examined on material covered up to here for the mid-semester exam, but don't quote me on this! Next will be a brief discussion on approximations and parameter variability, the latter of which might be described as an application of the law of iterated expectations and law of total variance, conditioned on the (Poisson) parameter (hence its namesake). Overall, this topic is very interesting, in that it is somewhat surprising that such neat results exist for such a complex random variable.

Individual risk model It is possible to regard this as an extension of the previous topic, as it examines in detail the convolution of compound Bernoulli (not Binomial) distributions. Its namesake is therefore derived from the fact that the compound Bernoulli distribution can be thought of as the claim amount, if any, arising from an individual risk (with the Bernoulli distribution being an indicator random variable for the claim arising or not; different to the collective risk model where an individual risk may make multiple claims). Our formulation will therefore look at properties of this convolution (namely its expectation, variance, and moment generating function, which is trivial) as well as a rather involved recursion (with its associated proof). Thankfully, the coverage on the individual risk model

is rather short-lived with the majority being dedicated to the development of the recursion and the final part being a brief discussion of approximation methods.

Bayesian statistics Conditional probability is obviously the focus here, as Bayesian statistics should have already been covered (from memory, if the syllabus has not changed) in one or both of the second-year mathematics subjects or ACTL30004 *Actuarial Statistics*. We review some of the basic concepts and introduce numerous definitions, some of which may be familiar already. I think personally this topic serves as a reasonably in-depth review of Bayesian statistics, as it cites several examples throughout the topic and overall prepares you well for the upcoming topic. Something that would help here is understanding well the fundamental definitions, as the notation used in conditional probability and statistical estimation might be somewhat foreign after an extended break. Loss functions round up this topic, but it is comparatively gentle content—all it really says is that the point estimate using Bayesian statistics can vary depending on the loss function. That is to say, it is not always $\mathbb{E}(\theta|x)$, with θ the parameter.

Credibility theory Fifth in the semester, this topic is perhaps the second 'large' topic, after the collective risk model. In short, we learn to adjust a future premium or a parameter based on the claim experience. From this definition, the reasoning behind a review into the underlying principles of Bayesian statistics should be obvious. Personally, I think that in approaching this topic, one should be aware of the overlapping terminology; the word 'credibility' is thrown around a lot and it appears in a number of definitions, so you should be critically aware of how to identify the differences in the definitions (for instance, of the Bayesian and credibility premiums, or of the Bayesian premium and the Bayesian estimate). I would imagine that, for most, the algebra behind the mathematics is reasonably doable and should not be too onerous; however, the same cannot be said for the notation and the definitions. Before the topic delves into a serious exploration of what is known as the Empirical Bayesian Credibility Theory (referred to as EBCT hereafter) models, it looks at a particular application of the initial development of the theory and gives some propositions and theorems, but this should not prove too difficult to grasp.

Perhaps the most frustrating topic in the second half of the semester is the first EBCT model; it has numerous assumptions and the notation can be really quite complex (some definitions are expectations and variances of particular functions of or conditional on some unknown parameter. Such issues are complicated by the fact that the notation plays an important role in the first EBCT model and it will be crucial in order to manipulate the algebra coherently and to perform computations for your own practice and the end-of-semester exam. Essentially, the EBCT models are a formulation that generates a credibility premium (as distinct from the Bayesian premium) given a sequence of random variables representing past claims. Several results are presented including the main result—the credibility premium itself—with their accompanying proofs (which should be memorised if not for the off-chance it appears in the exam but at the very least to understand methods of proof in this topic). More results are presented that I cannot possibly begin to list, but hopefully the practice problems that will be given to you should help consolidate some of the concepts encountered.

Unfortunately, the onslaught does not stop here. Occasionally you will be given a model and therefore be able to determine several important quantities analytically, but in the cases where such information is unavailable, you will be tasked with estimating these quantities. I think, however, the cases in which one or the other method is required is quite obvious from the information presented, so there should not be too much sleep lost over that. However, just as estimation of the variance of a sequence of Gaussian observations requires memorising the appropriate formula, the estimation here also is accompanied not only by notation, but formulae that are derived using the notation. Two of the estimators will be 'obvious', but one will require making a slight bias correction. Be prepared to perform computations, in memorising proof or otherwise. For instance, some of the proofs are reminiscent of proving that the previously mentioned variance estimator with denominator N is biased, albeit of higher difficulty.

Finally, the topic looks at a second and thankfully final EBCT model, which relaxes a few assumptions but introduces a weighting system and it is a generalisation of the first EBCT model. I think by now, while the proof will still be difficult to initially digest, the basic underlying theory of the second EBCT model should be very familiar, especially after immediately studying the first EBCT model. Indeed, most of the results are obvious analogues that have been adjusted for the weighting system, although I will admit that the way in which they change might not be regarded as obvious. I will not go into too much depth here because much of what needs to be discussed has already been said in examining the first EBCT model, but I will mention that you should be prepared to memorise more formulae and that the application of the model is slightly different due to the implementation of a weighting system. I will give my concluding thoughts; while the numerical complexity of the second EBCT model is far greater than that which could be reasonably expected in an end-of-semester exam, I think that this does not preclude the possible appearance of a question either demanding a certain proof or application of the model given summary quantities (by this, I mean for example being given the sum of a finite sequence so that you do not bear the time-consuming and tedious burden of manually computing the sum yourself) that can be used to answer questions.

Ruin theory Concluding the subject is a brief overview of ruin theory. I note that the discussion here is rather brief; at least in my year ruin theory only managed 3 or 4 lectures of discussion (actually, we might have been behind since a review lecture was scrapped). It takes a stochastic approach to the collective risk model; rather than have a counting random variable that counts the number of claims over a given period of time, say N, we have instead a counting **process**, say $N(t)$, that counts the number of claims over the time period $[0, t]$. Naturally, this extension allows us to generalise the collective risk model to be a stochastic process. Risk theory then takes the following approach: if this stochastic process, call it the aggregate claims process, is the total amount claimed over some time period, then we can introduce a surplus process, which describes the surplus of an insurer (with some initial surplus) as it evolves throughout time with the injection of premiums (theoretically a stochastic process per se, but usually simplified to be a constant rate per unit time) and the ejection of aggregate claims. Ultimately we are interested in, as the name suggests, the probability of ruin—i.e. the probability of the surplus of the insurer becoming negative.

From memory, there is a brief introduction into the (homogeneous) Poisson process, which should have been studied already in ACTL30001 *Actuarial Modelling I*; the enthusiastic might already remember all three constructions of the Poisson process and their associated proofs of mutual equivalence. We then formalise some definitions mentioned in the paragraph above in a general fashion, and in particular we give the ruin probability as well as numerous other interesting quantities. Possibly because ruin theory in academic circles is almost certainly more sophisticated than it is presented to us here, much of the material here will be definitions, remarks, and properties of the model.

Notably, there are two proofs: the first is an inequality relating the ruin probability to the initial surplus and some constant and the second is the existence of said constant as the unique positive solution to a particular equation. It is not all too complex (it involves induction, by the way), and the foray into ruin theory is overall quite brief and sparse. (Caveat: this may or may not depend on the amount of time that is available to this final topic; lecture slides beyond this proof existed but were not covered, ostensibly due to time constraints.)

Overall For those uninterested in reading the nitty gritty, I will give some summarising thoughts on the content covered in RT1 here. For most, this subject might give you the most trouble in your honours or masters year due to the mathematical nature of the problems. Multitudes of definitions and, more annoyingly, proofs are thrust upon you and for the most part you will necessarily remember these, as techniques present in the proofs occasionally recur throughout the subject (most noticeable in the proofs). Being comfortable with algebraic manipulation of certain

expressions will be extremely helpful in this subject I think, since a number of proofs essentially amount to this. I think that, while the material will initially seem very dense, you should find respite in the fact that a comparatively large proportion of the material is dedicated to proofs.

From experience, the review (first and fourth) topics should not pose too much problems. However, the material present in the second and third topics is very closely interrelated and this lends itself to a vast variety of questions you might face, while the material in the fifth and sixth topics is a bit more insular. I would imagine for most that there is a lot of memory work involved in the revision of this subject, and indeed there needs to not only be understanding of the preliminary and main results but also of their assumptions and proofs. As a caveat, the assumptions are important because you might be faced with a situation where you are unsure of the result(s) to draw upon. Some of the material should be familiar, which is why I mentioned earlier that strong foundations in the second-year mathematics subjects would be helpful (for instance, in the computation of integrals or point estimates). Nevertheless, the sheer amount of content covered in this subject should not be too daunting, given that it is an fourth-year exemption subject.

Lectures

Every week, there are 3 $\times$ 60-minute lectures with no tutorials, as per usual for a fourth-year actuarial subject. However, from memory, every second week will be dedicated to the giving of solutions to a tutorial set (there are 6 tutorials in all, with 11 additional problem sets that are not covered in class). From memory (again), said solutions to both tutorial sets and problem sets are posted on the LMS after some delay, so these classes are strictly speaking, unnecessary. If, however, you enjoy the structure of tutorials, then it obviously might be of benefit to you. As a precaution however, be prepared for a possibly abhorrent timetable for your fourth year; not only will you probably see obligatory 5–6-hour breaks due to RT1 and ACTL40004 *Advanced Financial Mathematics I* lectures usually scheduled before noon and ACTL40006 *Actuarial Practice and Control I* being scheduled on Tuesdays and Thursdays from 4:15–6:15pm, but you might also find yourself with a single RT1 class on some random day in between. I mention this only because while you might endeavour to attend every class, the possibility of your lecture being scheduled poorly (ahem, Wednesday 9am with nothing else) might be a significant deterrent.

Expect a reasonably small class size, ranging from 20–50 students, roughly speaking. From experience, you will probably become close with your classmates (and I strongly urge you to do so as it makes fourth year all that more tolerable), but this might not happen quickly enough for lectures to be a bit more interactive and for the atmosphere to soften. Nevertheless, you might find yourself more confident in responding to lecturer's prompts and asking questions during tutorial time, which you should do. I have the faint suspicion that, as an exemption subject and as by fourth year you are probably cognizant of mark scaling, people are more reserved in class, since they view others as competition which may affect the mark scaling. I hope for the most part that this does not deter people, because quite frankly the material is difficult enough and the burdens borne are so great in the first semester (subject revisions, projects, assignments, graduate program applications/interviews, and whatever social life you've managed to preserve up to now) that being able to mutually help one another is usually in your best interest (as they say, teaching is the best way of learning).

NB: the absence of lecture capture means that you should skip class at your own peril. While you might be able to mitigate some of the problems with truancy by relying on your friend's or friends' notes, this obviously is no substitute for actually being in class and, say, writing down the proof line by line with the lecturer guiding you and describing the rationale behind each step. I'm personally a bit biased on this issue because I think that you should practise attendance whenever possible, but in this particular case I recommend it highly simply because lecture capture is unavailable and you will not as easily understand the logic behind the results, proofs, nor examples,

without the assistance of the lecturer.

Mid-semester exam

In 2015, the mid-semester exam covered material up to and including the fifth week and its date fell in the first class of the seventh week. While it is not overly difficult, as per most mid-semester exams, it will be stressful revision because of all the other responsibilities you will inevitably have. Use the available material—the recommended text, tutorial and problem sets—to your advantage, but do not rely on the mid-semester exam being similar. Indeed, while the questions that the 2015 cohort faced were not strictly speaking all that difficult, the variation in the style of questions was sufficient to pave way for an average below 40% and marks ranging from barely being above 0 to barely being a H1.

In defence of the mid-semester exam, there were a few textbook questions and it was for the most part quite accessible to the diligent student. Calculators played a minor role in that there was, I think, one question that mandated a numerical answer, which therefore implies that the majority of the exam demanded answers in analytic and symbolic form. Being familiar with the techniques you encounter in class will be **extremely helpful**; at least it was the case for the 2015 mid-semester exam. That said, I do not want to pigeonhole expectations of the mid-semester too much, as the vastness and richness of the content covered in the first five weeks lends itself to a wide variety of plausible questions.

End-of-semester exam

I will make a brief note of the scaling in 2015; it was upwards by a moderate amount, suggesting the exam was more difficult than average. If I recall, the calculator was used somewhat often, although thankfully analytic expressions dominated the exam. As with all exams, the scope of the exam was parallel to the coverage of the content throughout the semester. By this, I mean that all topics were covered to an extent proportional to the amount of time dedicated to their study.

To begin, there is a reasonable amount of proof throughout the exam (for instance, one question consisted entirely of proofs, although they were textbook) but overall with an emphasis (I feel) on analytic results. Overall, the exam performance was apparently poor (that's an understatement). Truthfully, however, I feel that six of the seven questions that appeared in the 2015 paper were slight variations of practice problems appearing elsewhere which, with proper thought and care, any well-prepared student could answer. If I may give any sentiments on the exam, the questions, except perhaps one, were **doable**. It might be own taste, but any question which is doable is, by my personal standards, fair game in the exam. Indeed, looking back, the questions—which covered pretty much everything from the second topic onwards—were not all that straightforward, but by no stretch of the imagination could one say that they were unreasonably hard. I would think that as an exemption and fourth-year subject, the questions were rightfully testing. I personally think, however, that there was a single question which should never see the light of day in another exam for posterity, only because the algebra was incredibly tedious. Going home and attempting it on Mathematica, I found that the problem involved a seventh order polynomial with two roots, one with multiplicity six and the other being the unique positive solution (assuming I did it right). I do not know what will become of the question in the future and whether my sentiments are objectively correct (i.e. whether the lecturer(s) agree that it was algebraically frustrating), but if anything I think it serves as a potent reminder for just how computational this subject can be. While I do not think it is the intention of the lecturers to test our understanding by asking us to sift through and manipulate lines upon lines of algebra or use the calculator excessively, it is inevitable that

algebra and numerical computation appear in this exam. I think it is therefore prudent to prepare for both, whether the question is seeking for a result, a proof, a number, a verification, et cetera.

NB: In defence of the cohort, while the question which I felt was unreasonable could have been left to last with prudent use of reading time (which is obviously important), the methodology that would have been used to solve the question was comparatively simple and I do not think it possible for the typical student to have the foresight to see that the algebra would be devastatingly time-consuming.

Concluding thoughts

Despite the challenges that I personally faced in this subject, I certainly enjoyed it. Sure, there is increased pressure because it is an exemption subject, but it is also an exemplar of the mathematics that probably attracted many students to the course. I think that the results are rather deep given that it is intended to serve as a foray into the applications of probability and statistics in insurance.

Admittedly, the material and the exams can be quite daunting. However, take comfort in the fact that you have great lecturers and a comparatively large number of practice problems to develop your skills and cement your understandings. Even though there is a large amount of memorisation that you should be prepared for, this is not advisable without the requisite understanding. After all, I would imagine it would be a godsend for questions in the exam to be carbon copies of those encountered in practice problems or request exact replicas of the proofs that appear in the lecture slides. Thus, if you are prepared for some variation in the questions you will encounter in your examinations and adapt your understanding to the problem appropriately, I think you should do fine.

Finally, I hope you enjoy this subject—it might be one of the last quantitative actuarial subject you study as you might find yourself in a second semester with, for better or worse, little to no mathematics. It is also a good time to make some friendships with the cohort whittled down to a smaller size; certainly this was the case for me. I think that, while it will be a difficult road to finish the final two exemptions, it will be a satisfying challenge. Good luck—for this fourth year and thereafter.

ACTL40004 Advanced Financial Mathematics I

Exemption status	CT8 *Financial Economics*, in conjunction with ACTL30006 *Financial Mathematics III*. Satisfactory performance in the mid-semester test and end-of-semester exam of this subject and satisfactory performance in the end-of-semester exam of ACTL30006 *Financial Mathematics III* are required.
Lecturer(s)	Dr Zhuo Jin
Weekly contact hours	2 × 1.5-hour lectures
Assessments	Individual assignment 10% 1-hour mid-semester test 20% 2-hour end-of-semester exam 70%
Textbook recommendation	✓ The subject notes are the only essential textbook. Joshi, M.S. (2008). *The Concepts and Practice of Mathematical Finance* (2nd ed.). Cambridge, UK: Cambridge University Press. ✗ This is not essential at all. It is needed for ACTL40008 *Advanced Financial Mathematics II*, so if you know you will do AFM2 then buy it.
Lecture capture	None.
Year and semester reviewed	2015 Semester 1

Comments

Subject content

Largely consists of derivative calculations and related proofs and derivations. Major areas include European and American call and put options, forward contracts, binomial trees, interest rate derivatives, arbitrage pricing, Black–Scholes formula, and Itô calculus.

Other remarks

Overall, AFM1 is a challenging subject and one where some concepts will take time and effort to understand to a satisfactory level. It is more challenging for some students than others, and this will depend on your preference to different types of maths. The underlying concepts are largely related to what was learnt in ACTL30005 *Models for Insurance and Finance*, so a solid understanding of this material will give a good base. If you enjoyed Brownian Motion then this subject will likely be more to your liking. The real challenge is the last half of the course (and particularly the last few weeks), so try to stay on top of things as the semester rolls on.

The subject is delivered similarly to previous FM subjects, going relatively quickly through slides each lecture. This can be hard to follow at times, but just try to take in as much as possible and review the material after to gain a proper understanding. One difference is there are no longer tutorials. There are still weekly questions, but these are instead gone through by the lecturer each week at the end of the second lecture. This works well; try to at least

attempt the questions before class as this will increase the effectiveness greatly.

My main piece of advice would be to properly learn the material. By this I mean actually learn how everything works and understand it instead of simply being able to reproduce the tutorial questions. The exam will likely have questions that are different to those you have seen throughout the subject and which will require a deeper level of understanding than most tutorial questions. Try not to just rote-learn things.

ACTL40006 Actuarial Practice and Control I

Exemption status	Part IIA *The Actuarial Control Cycle*, in conjunction with ACTL40007 *Actuarial Practice and Control II*. Satisfactory performance in both subjects' end-of-semester exams is needed.
Lecturer(s)	Mr David Heath Mr Andrew Brown Mr Donald Campbell
Weekly contact hours	2 × 2-hour lectures
Assessments	Group assignment 30% 3-hour end-of-semester exam 70%
Textbook recommendation	If you want, you can purchase the subject textbook (used for ACTL40007 *Actuarial Practice and Control II* as well), ✗ but it is unnecessary, and I would suggest not buying it.
Lecture capture	Yes (both audio and video).
Year and semester reviewed	2015 Semester 1

Comments

Subject content

There are three main areas of study—general insurance, life insurance, and superannuation. There are also two additional lectures about investments. A broad range of topics are covered—some specific to one of the three areas and others not. These include pricing products, reinsurance, control cycle, professionalism, and risk framework and modelling.

Other remarks

You will be told multiple times that this subject is completely different to any other actuarial subject you have done. This is correct and the most challenging aspect for many students. You basically do not need a calculator; the subject is not about maths but rather about theory and the thought process behind decision-making. However, this shouldn't discourage students. It simply requires an adjustment in perspective and study strategy.

This is a subject where rote-learning will definitely not work or, at the very least, be highly inefficient and waste a lot of time.

The subject is delivered entirely in lectures—no tutorials. There is also a rotation of lecturers, the three main ones focussing on general insurance, life insurance, and superannuation respectively. This adds some variety, which is good. They are all quite good lecturers and are experts in the industry so are very knowledgeable. The creates the perspective in the subject of working in the industry, which is a nice change and good, considering most in attendance will soon be working.

Approach the subject with an open mind and try to see the new type of subject as a challenge. Throughout the semester it will be difficult to know how to study. I would recommend attending lectures and answering/asking questions as much as possible. The lecturers will answer anything and would rather you ask a bad question than stay silent; don't be shy. Discussion during lectures will help you learn the material. At the start of the semester you should go through the "fundamentals" documents, which outline the industries and their various products. Knowing how the products work goes a long way to understanding the concepts studied throughout the subject.

At the end of the semester (or throughout), it is a good idea to make notes for the entire subject. I would recommend trying to make them organised and relatively concise. Don't just copy down the lecture slides. This is useful as a form of revision and also to take into the exam, which is open book. However, try not to be too reliant on notes during the exam.

Overall, I found this subject enjoyable and interesting, largely due to the new material not previously covered. While a lot of students find the theoretical aspect quite difficult, it is not an inherently difficult subject. The material itself is quite manageable.

ACTL40008 Advanced Financial Mathematics II

Exemption status	N/A; this subject does not constitute any exemption requirement but is instead an elective upon satisfactory completion of ACTL40004 *Advanced Financial Mathematics I* (which comprises part of the exemption requirement for CT8 *Financial Economics*).
Lecturer(s)	• Professor Mark Joshi • Professor Daniel Dufresne In 2015, the lecturer was Professor Mark Joshi. **NB:** I do not mean to say that both lecturers teach simultaneously, but rather that one of these two lecturers will teach the entire semester.
Weekly contact hours	2×1.5-hour lectures
Assessments	50-minute mid-semester exam 20% 2-hour end-of-semester exam 80%
Textbook recommendation	Joshi, M.S. (2008). *The Concepts and Practice of Mathematical Finance* (2nd ed.). Cambridge, UK: Cambridge University Press.
Lecture capture	Yes (both audio and video).
Year and semester reviewed	2015 Semester 2

Comments

Before anything else, I firstly wish to make the remark that the recommended texts and the availability of lecture capture will presumably depend on the lecturer. Naturally, the same applies for the content and/or structure of the subject.

By now, you are most likely aware that this subject is the final subject in the *Financial Mathematics* pentalogy. Notably however, the material in ACTL40008 Advanced Financial Mathematics II (AFM2) is *very* different from that encountered in the first three subjects. Using the material taught in ACTL40004 *Advanced Financial Mathematics I* and ACTL30005 *Models for Insurance and Finance* (AFM1 and MIF, respectively), the focus of the subject is mathematical finance and, in my opinion, its purpose is to serve as a more mathematical foray into the material developed in AFM1.

Subject content

It is somewhat necessary to have a modicum of knowledge about the content that is covered in AFM1 before we can really discuss the material encountered in AFM2 as, surprise surprise, they are sister subjects. Broadly speaking, AFM1 covers:

- principle of no arbitrage (put simply, the idea that opportunities of making money must carry the risk of losing money)
- pricing of derivatives using hedging, replication, and risk-neutral techniques

- Brownian motion, continuous time martingales, and stochastic calculus (in the latter case, there is some emphasis on stochastic differential equations)
- Black–Scholes model; its partial differential equation, associated Greeks and formulae, defects and extensions
- interest rate and credit risk derivatives and pricing models thereof

It should be immediate by now for those finishing third year that the focus of both AFM1 and AFM2 is quite different to that of all previous *Financial Mathematics* subjects. In any event, it is probably reasonable to say that the Institute standards of AFM1 mandate a reasonably deep discussion of some of the basic ideas underpinning quantitative finance.

Perhaps the best description of what the material taught in AFM2 comprises of is to say that it is an extension of all the topics encountered in AFM1. I have a personal belief that, as AFM2 is not an exemption requirement, the material is somewhat a bit more malleable and therefore admits extensions, most of which are mathematical. For instance, the concept of a risk-neutral measure is introduced in AFM1, but the way in which it is presented might give the impression that passing to the risk-neutral measure is the only pricing technique employed by practitioners. However, in AFM2, the more general notion of the *numeraire* grants access to a vastly superior pricing method. To illustrate this, the well-known Black–Scholes call option formula

$$C(S_0, 0) = S_0 N(d_1) - Ke^{-rT} N(d_2)$$

can be obtained via brute force integration with respect to the (lognormal) probability density function of the stock price process in the risk-neutral measure (pardon the jargon). However, the methodology that is shown in AFM2 is far quicker, and indeed the call option formula may be written down as the linear combination of a (lognormal) survival probability computed in two different measures. Similarly, you will most likely be *told* that the Jarrow–Rudd tree in AFM1 has a risk-neutral probability that is very close to 0.5. However, you will not understand *why* that is the case until AFM2, where a mathematical examination of the asymptotic behaviour of the risk-neutral probability using Landau notation will show that this is the case.

I suspect that the connection between AFM2 and MIF is a little less tenable, but personally I find MIF to be a very suitable precursor to both AFM subjects. Indeed, MIF serves as good preparation for a more rigorous discussion of some fundamental concepts that arise in AFM1 and AFM2. Elements of probability spaces, conditional expectations with respect to a sigma algebra, continuous time martingales and stochastic calculus are present in both AFM subjects, albeit to varying degrees—one very clear instance of this is the apparent absence of dedicated lectures to probability spaces, perhaps because they are rather theoretical and most computations can be performed without understanding, say, integration with respect to some measure. Nevertheless, I would recommend, be it for students only interested in studying AFM1 for the exemption requirement or those wanting to also study AFM2, taking MIF in third year.

Having digressed, I will now come back to the content in AFM2 specifically. In 2015, we looked at the following topics:

- principle of no arbitrage and pricing on binomial trees
- continuous time martingale and stochastic calculus
- multiple sources of risk (extension of the above)
- vanilla interest rate derivatives

Immediately one might notice the similarities between these four topics and those listed for AFM1. Black–Scholes is apparently absent, but it instead comes back in different forms throughout the subject. For some time, I will discuss each of these topics in a bit more detail—for those uninterested in the minutiae, feel free to gloss over the next

couple of paragraphs.

In the first topic, this is essentially a mathematical extension of the knowledge developed during study of AFM1. Further results include, for instance, the model independent property of call option prices being convex in the strike (proven by no arbitrage). Much of the overarching concepts will be familiar territory after AFM1, but it nevertheless goes into rather deep mathematical detail in some areas in the advancement of new ideas. To exemplify, there is a rather 'obvious' result—that a sequence of portfolios that replicate in the limit some derivative should also have the same price in the limit—which commands a proof spanning almost an entire lecture and demands also a stronger analogue of the principle of no arbitrage.

For the second and third topics, which I can perhaps summarise as 'applications of stochastic calculus', the content covered should be quite familiar but simply applied to different problems. Here, the numeraire is explored in more detail and several techniques that are useful in derivative pricing are shown; it would be a significant advantage for a student studying AFM2 to understand these well as they recur often. Some foreign content appears, such as the time-dependent volatility Black–Scholes model and the 2-dimensional Taylor's theorem, but most of the material here can be handled without losing much sleep. I should caution however that there is a particular lecture deemed by Mark himself to be one of, if not the, hardest lectures you will attend in all four years of your actuarial tuition. Specifically, the lecture delves into the computational mechanism by which a change of measure is performed; students by the end of AFM1 will be aware that it is *possible* to arbitrarily add drift to Brownian motion by passing to another measure, but the precise details of *how* will form the crux of this lecture. Even though the context—barrier options—is quite a practical problem, the supporting mathematics, which involves finding a joint distribution involving Brownian motion, can be rather difficult. Following this is consideration of the natural extension of stochastic calculus to the case where either

- a single asset is driven by multiple, correlated, Brownian motions or
- multiple assets are driven by correlated Brownian motions

Some theorems are given (the multidimensional Itô lemma and Black–Scholes partial differential equation), but apart from a lecture on the pricing of quanto options (where the pricing method can be quite confusing at times), I think it's safe to say that the content covered in these topics are, for the most part, manageable.

Last but not least is the fourth topic: vanilla interest rate derivatives. It will begin with a light refresher on the material encountered in AFM1, before delving into the mathematical aspects of the LIBOR market model. If you are worried by now however that the subject is primarily mathematical, this is certainly not true. Spread throughout the entire course there are discussions of varying lengths dealing with pragmatic issues such as the acceleration of pricing on binomial trees, methods of numerical integration, acceleration of Monte Carlo simulation, and methods of generating random variables (knowledge of first-year linear algebra is somewhat helpful here, as the Cholesky decomposition, eigendecomposition and diagonalisation make an appearance, albeit briefly). However, while the final topic may ostensibly be very mathematical, it is actually perhaps the most pragmatic topic of all.

First off, you will begin by learning how to perform computations of drift with different choices of the numeraire when the model of choice is the multidimensional Black–Scholes model. Mathematical symbols and convoluted equations may obfuscate the apparent usefulness of proven results, but it nevertheless serves as a potent reminder that model users need only an implementation algorithm and not mathematical elegance. Despite the general consensus in the actuarial cohort being that theory is often more difficult than practice, I would argue the contrary here; without any practical experience in model implementation and appreciation for coding efficiency, I would imagine that much of the pragmatism to be gleaned is lost in translation. In spite of all this, the focus of this topic is practical implementation of the LIBOR market model, so methods of improving approximations to stochastic differential equations as well as a significant discourse spanning five to six lectures on methods of calibrating the

model are also put forward. Indeed, it is rather beguiling when the mathematics appears to be sparse; we would expect it to be quite easy to rote-learn the qualitative aspects of the course, but I would imagine for most people that fully understanding a maximally time-homogeneous algorithm of solving a system of equations in n-fold space lying on the intersection of a sphere and cylinder is rather difficult. Thankfully, the subject concludes with a lighter, slightly more formulaic section on an extension to the LIBOR market model.

Of course, please bear in mind that this review was written with regards to the subject in 2015, so the content might differ in future years (although, perhaps, this review might be superseded by then). Having described now all the content (in perhaps too much detail!), I can probably say that the difficulty is **reasonably hard**; however, this should not be surprising, given that it is a fourth-year actuarial subject. Obviously, I cannot compare between the other possible electives, but with certainty I can say the subject is challenging and you might be confused immediately after a lecture on numerous occasions. However, with enough determination, it is certainly possible to overcome these issues with enough revision and time. Some aspects of the difficulty will simply be attempting to memorise either formulae or theorems; others will be due to the apparently convoluted nature of the problem. I will speculate here and suggest that, as AFM2 is not bound to Institute standards as it is not an exemption requirement, there is more room for rigorous mathematical treatment of financial problems. It is still very accessible and taught very well, and indeed while MIF and AFM1 will prepare you well for the majority of the material encountered in this subject, having a modicum of knowledge in some of the entry subjects should be beneficial but not necessary. In short, the subject in my opinion coherently pieces together the theoretical framework underpinning quantitative finance, ignoring neither the mathematical rigour nor the issues of importance to practitioners. Problems faced will be primarily computational, but not of the numerical kind; most solutions can be written analytically.

Lectures

Being a fourth-year actuarial subject, there are no tutorials. However, you may see particular lectures set aside for discussion of practice problems. To this end, you will probably want to acquire the book and take it with you into said lectures, because Mark will discuss solutions to the practice problem(s) you wish to seek explanations for as well as any other queries surrounding the subject. Consequently, these lectures will constitute the closest thing to a tutorial you will have in this subject. Practice problems are available in the recommended text and additional questions are available on the LMS. Given that the amount of supporting material is quite sparse, you will probably want to finish all the relevant questions. Please note: such lectures are interactive. By now, you have undoubtedly discovered that some classrooms have this perpetual atmosphere of awkward silence, but hopefully with a reduced cohort the attitude of waiting until someone asks the first question slowly dissipates. For me at least, it certainly made the lecture more tolerable when someone—be it myself or someone else—asks a question, since I can tell you first hand that I would rather get a question answered and possibly feel like an idiot after than sit in a room where you can cut the tension with a knife.

For standard lectures, I would say this: absence should be practiced at your own peril. If I can say anything that would encourage attendance, it is simply that the lectures are far more bearable than those in previous semesters; the size of the class for AFM2 is usually very small, which makes for a very relaxed closely-knit experience (for the past four years, enrolment has been in the single digits). From memory, lecture slides are intentionally empty in some regions to encourage attendance (so that you can fill them in with reference to the complete slides), but this is not strictly necessary given the availability of lecture capture (**NB:** I personally never used it, but I am fairly sure that there was both video and audio). Given that most students are probably going to be concurrently studying the *Actuarial Practice and Control Cycle* subjects (APC) which have lectures on Tuesday, Thursday, and Friday (at least, this was the case in 2015), you probably have nothing to worry about if you are concerned about wasting your

time coming in for a single lecture since you can be productive during the breaks (they are unbelievably long, by the way). Given also that the size of the class is so small, it is possible for engaging discussions to be had even during standard lectures; my personal experience has been that there is an element of informality which makes lectures much more enjoyable. Moreover, both the lecturers have interesting idiosyncrasies—Mark often asks an interview problem (sometimes mathematical, physical, algorithmic, etc.), which is usually thought provoking and highly interesting. Likewise, if you are keen for Daniel's jokes and sense of humour (I'm a bit biased here), then that only gives one more reason to attend. Both lecturers are absolutely fantastic and very approachable which, combined with small class sizes, is particularly conducive to your learning. If not for the benefits to your understanding of the content, I strongly recommend you attend simply because it should make what is most likely your final semester of formal education all the more enjoyable.

Mid-semester exam

In 2015, the mid-semester exam covered content up to and including the fifth week. Normally, it is not overly difficult and is intended more to force one to study so that by the end of the semester, there is not this mad rush to cram everything. You can expect that the questions should test your understanding and not necessarily be computational; I believe that for my mid-semester exam, the scientific calculator was basically useless. I cannot really give any numerical indication of the exam difficulty since the sample size is rather small; if memory serves me right, the average was around the 65% mark or thereabouts.

Questions were of equal weighting and roughly of the same difficulty, although depending on how well you recall aspects of the subject, some questions will invariably appear easier or harder than others. Objectively, there was probably only one difficult question, since its suggested solution was far less obvious; the remainder could be described as 'textbook'. It should not be remarkably difficult, provided that you have understood the material covered so far and are capable of identifying and applying the appropriate techniques. Generally speaking, most mid-semester exams are quite gentle, at least in comparison to the final exam.

I also make a brief note of the fact that the assessment comprises only of exams; in my opinion, this is an advantage, since I'd personally much rather study for a single mid-semester exam than be constantly bombarded with assignments, as was the case with those who chose ECOM30004 *Time Series Analysis and Forecasting* (TS). Sure, it might make your SWOTVAC slightly more stressful as the content of a fourth-year actuarial subject is probably harder, but your in-semester workload is somewhat gentler when the proverbial hits the fan and you're looking down the barrel of approaching APC and TS assignment deadlines in conjunction with submission deadlines for the final project or research essay.

NB: THERE IS NO FORMULA SHEET FOR EITHER EXAM.

End-of-semester exam

You might have noticed by now that exams often carry an element of scaling should the situation mandate it; in 2015, scaling was upwards, suggesting immediately that the difficulty of the exam is above average. I have already mentioned this, but the first thing to note is that while you will inevitably use your scientific calculator, there is little emphasis on numerical computation. Hence, if you are able to devise some approach to the question, most of it will flow through quite naturally and without much time wasted on punching buttons.

If memory serves me right, what amounted to mathematical computation was essentially a question that required

you to find an analytic expression; these questions will dominate the exam (or at least did in 2015). Questions draw on all four key topics to varying extents, usually dictated by the proportion of the subject dedicated to each topic. For instance, you might be asked to evaluate a particular probability or expectation and leave your answer as an analytic expression. By now however, you should already be fluent in symbolic evaluation, so this doesn't really pose any real issue (other than knowing how to find the relevant probability or expectation of course).

From a holistic perspective, the exam tests understanding of techniques and when to apply them. It may vary from testing your ability to create a replicating portfolio or to perform symbolic simplifications, for instance in pricing a derivative under the Black–Scholes model. Much of the exam will depend on your ability to do computations by applying the techniques you will have learnt appropriately. For instance, in the pricing of a derivative, it might be expected that you integrate; in showing that no arbitrage opportunities exist, a hedging or replication argument might be suitable; in approaching a question on stochastic calculus, applying the multidimensional Itô lemma might be a good starting point. **All the computational tools are taught to you**—but it is up to you to know when to apply it. Time, as with any exam, is always an issue, so there is a significant advantage to identifying efficiencies in solving questions. Take, for instance, the proof of the Black–Scholes call option formula that I mentioned earlier; would you rather write down lines upon lines of tedious algebra (if you do not use elementary results, the risk-neutral integration requires a substitution that then requires completing the square) wherein mistakes can hide or would you rather write down a solution that could fit in the margin? In 2015, the exam was reasonable; there was ample time for the diligent student to finish, with some time to spare. I am not saying the exam is not hard: while there may be some questions that will make you laugh uncomfortably at your own distress, I would say that the questions in my year were **doable**, in the sense that they did not require insane mathematical working that goes significantly beyond what could be considered reasonable for an exam situation.

I have so far only discussed the quantitative aspects of the exam which mostly, as stated, requires application of several techniques refined throughout the course of the subject. In spite of its namesake, the AFM2 exam is home to some qualitative questions, which can range from requiring you to write a short sentence to a brief paragraph to an essay. If writing ability is an issue, this is certainly one that needs rectification as your written arguments need to be like any other piece of written literature—coherent, persuasive, and so on so forth. It will probably be somewhat self-evident as the subject unfolds where the qualitative aspects can be inserted into the exam; as a general observation, I would imagine that elements free of mathematical abstraction would be prime choices.

Even though there is a wide range of practice problems for you to play with, one thing I would advise against is to fall into the trap of believing that success in practice problems will translate to success in the exam. I am not saying you should not do them anyway; there are numerous cases of practice problems that actively test your ability to use specific mathematical techniques as well as test your understanding of qualitative considerations in mathematical finance. Indeed, it would be remiss of me to simply forget the benefits conferred by encountering various practice problems. However, I think it is wise to bear in mind that mathematics is a massive area and the potential for questions that may appear utterly foreign to you in the exam is very real. It is an advantage to be able to recognise similar questions and thus apply similar techniques, but when (not if) questions arise that are utterly foreign, a study methodology based solely on practice problems will do more harm than good as it will not only deceive you into a sense of false security but also fail to give you the understanding required to apply techniques generally. For this reason, I suggest that if you decide to embark on the AFM path, you should prioritise absorbing theory; an ability to do the exam will come as a byproduct of this, but the converse I do not believe to be true. I acknowledge that this view is my own, however, and that the reader might have very different methods of studying. I have no intention to dictate how you should study, but I would recommend studying theory simply because the sheer expanse of mathematics admits so many different types of plausible questions—preparing for each and every one is nigh impossible.

Concluding thoughts

Overall, I would say that the subject content is delivered well, and you will benefit from both the theoretical and practical aspects of the subject which are both broad and deep. It gives a very good discussion of some of the fundamental principles underlying modern mathematical finance without sacrificing both the elements of rigour and pragmatism. For those interested in the area, this is without a doubt the obvious elective.

I hope that you will not find yourself in the same situation, but I know some that shied away from the subject due to concern over their average breaching the passing benchmark of 65. Daunting as it may be, I think TS, a popular alternative, is far from the 'bludge' or 'free H1' that many may perceive it to be. Rather, it is much easier, having already done AFM1 and been introduced to the basic ideas, to enrol in AFM2 than it is to be thrown into the deep end (i.e. without the proper background) of a third-year econometrics subject. It will depend on personal preference, but I would also much prefer a single mid-semester exam than four assignments throughout the semester.

As with any subject, the difficulty will depend on how much of your time you intend to dedicate studying. Moreover, your study should emphasise understanding theory. Of course, there will be elements which you will inevitably rote-learn, such as theorems, lemmas, corollaries, propositions, qualitative aspects and whatnot, but for the most part, success in this subject like in any other subject comes from comprehension, not memorisation. Objectively, the material taught is not spectacularly hard, nor is the exam relative to some others. It is certainly within the realms of what one can reasonably be expected to achieve, but that is not without hard work and steady resolve. Poetic aphorisms aside, this subject is definitely one to consider if you enjoyed the content in AFM1 or enjoy mathematics. In making your decision, bear in mind that this is, unless you are intent on postgraduate study, going to be your last semester of formal education—study what you want to study, since you might as well enjoy it. I hope you have enjoyed this review, and all the best for your fourth year of Actuarial Studies.

Breadths and Electives

BLAW10001 Principles of Business Law

Exemption status	None.
Lecturer(s)	Semester 1 Ms Tanya Josef Semester 2 Mr David Babovic
Weekly contact hours	1 × 2-hour lecture 1 × 1-hour (optional) tutorial 1 × 1-hour workshop (every 3 weeks)
Assessments	1-hour online multiple-choice test in Week 4 10% 1-hour online multiple-choice test in Week 9 10% 1.5-hour multiple-choice end-of-semester exam 80%
Textbook recommendation	Lambiris, M., & Griffin, L. (2015). *First Principles of Business Law* (8th ed.). Melbourne, AU: Oxford University Press Australia. Note that a newer edition may be required. ✗ The textbook is quite expensive for such a small book, and you don't even use it in its entirety. Try to buy second-hand if you don't mind missing out on the e-tutorial. New books (not second-hand) will come with an e-tutorial software you will have to download and redeem on a computer. Note that these tutorials can be helpful—they consist of multiple-choice questions and can be used for revision.
Lecture capture	None.
Year and semester reviewed	2015 Semester 1

Comments

Is it a bird, is it a plane? No, it's your WAM (weighted average mark) going through the roof! As a completely multiple-choice subject, you have no excuse to do poorly; it is so straightforward, you have a 20–25% chance of guessing every single question right.

As a level 1 breadth subject, this is highly recommended for those who just want to breeze through first year or those who need a WAM lift.

Subject content

The course itself is broken up into different aspects of Australian law. It is primarily focussed on theory, with a lot of cases (more than 30+ cases) which must be memorised or included in a double-sided A4 cheat sheet for the multiple-choice exam. Exactly, you even get a cheat sheet for this multiple-choice exam; what more could you ask for?

Weeks 1–2 are spent covering Australian legislation and how the Australian parliamentary system works.

Week 3 is spent on the role of courts in law-making (case law) and the Australian legal system.

Weeks 4–8 are spent on contract law. Note that there is a lot to cover in this section: from what constitutes a contract to breaches/resolving breaches of contracts. It gets dry, but there are interesting cases to fill in the gaps.

Week 9: Australian consumer Law (definitely the most applicable part of the course to your everyday life). Don't like those pesky telemarketers calling you after 5pm on a weekday? Turns out they can't!

Week 10: Tort law, focussing on negligence, which is basically when someone fails to take precautions against a **foreseeable risk**.

Week 11: Agency law, basically getting someone to act on your behalf and the consequences for it.

The most enjoyable part of this was definitely the cases involved, as you get to hear a lot about what occurred in the cases which shaped Australian law.

Lectures

Semester 1, Tanya is amazing! She's passionate, excited, and always looking to make sure her lecture is entertaining. Semester 2, I've heard otherwise. David, as described to me, is very dry and lacks the enthusiasm Tanya has. Highly recommend taking it in Semester 1.

As for the lectures themselves, they are 2 hours long and cover a lot of cases/content, so it is advised that you do have a computer or a fast-writing friend with you, as the lectures aren't recorded.

Generally speaking, the lectures were quite packed (as everyone understands that they aren't recorded).

However, the ultimate question comes down to, you've come this far, choosing a fully multiple-choice subject, are you willing to go the last step and skip lectures? I would not recommend this. Tanya includes a lot of additional comments and insights in her lectures, and missing them will be detrimental to a degree for your understanding. However, from experience, missing the last 4 lectures of the semester did not result in a less-than-H1 (80+) score, so it is definitely possible to attain a high score and miss some lectures on the side.

Workshop

The workshop consisted of individuals asking questions on what they did poorly on in the practice tests in preparation for the online test. If you struggled with the practice test, you should attend this. However, if you've done your work, the test should be simple, so the workshop can be skipped.

Assessments

The two multiple-choice assessments, which go for 1 hour, are worth 40 marks each.

Basically, you will log onto LMS and complete them in one sitting. Try to ensure internet connectivity is not an issue. The online multiple-choice questions can range from having 3–8 different choices, so it's not as straightforward as a normal test.

The first one was extremely easy, it is definitely doable with little practice or revision. As they are online, just have your textbook by your side with your notes, and you'll do fine.

The shock comes with the **second online test**. Difficulty instantly ramps up, and it is highly suggested that you actually prepare for these. Make notes, revise them, and ensure that you know what you're talking about when it comes to individual cases. I know people who failed because they didn't prepare and expected it to be like the first one.

End-of-semester exam

As you have 90 minutes to complete the exam of 60 MC questions, you will find that there is plenty of time as long as you have a good cheat sheet and have done some revision.

Having missed the last 4 lectures for reasons which will not be explained, the exam at first seemed daunting. However, in previous years, it has been in the last week of exams and so gives you ample time to prepare. Personally, I had a week gap between this and the exam before it.

With upwards of 40 cases to memorise or write down on a cheat sheet and a lot of information missed due to unattended lectures, how do you prepare for this exam?

The answer is simple: utilise your cheat sheet to its fullest extent. Personally, I printed at size 8 font, double-sided and 2 pages per sheet for a total of 4 real pages compressed onto a single piece of paper. This allowed me to fit 9000+ words onto the cheat sheet, and I was able to fit the entire course and every single case (with some information associated with it) onto the cheat sheet. By doing so, I was able to breeze through the exam. You will even notice that some of the multiple-choice answers are ripped straight off the textbook.

Try to colour-code the cheat sheet if the font size is getting too small.

The subject is extremely easy to cram, and only takes around 1 or 2 **full** days of work to have it down pat.

BLAW20001 Corporate Law

Exemption status	None.
Lecturer(s)	Professor Helen Anderson
Weekly contact hours	1 × 2-hour lecture 1 × 1-hour tutorial
Assessments	Individual assignment, due after the mid-semester break 25% 2-hour open-book end-of-semester exam 75%
Textbook recommendation	Hanrahan, P., Ramsay, I., & Stapledon, G. (2015). *Commercial Applications of Company Law* (16th ed.). Melbourne, AU: Oxford University Press Australia. ✓ The textbook is recommended—it contains the details of cases and legislation mentioned in lectures, and you can bring the textbook into the exam.
Lecture capture	Yes (both audio and video).
Year and semester reviewed	2015 Semester 1

Comments

This is the second law subject in the law breadth track and a good breadth to choose for anyone interested in the JD, wanting to keep the accounting major option open, or those wanting some working corporate law knowledge. If you expect this subject to be like BLAW10001 *Principles of Business Law*, you will be proved wrong. This subject expects you to be able to analyse a scenario, apply legislation, and ultimately draw a conclusion as if you were a lawyer. These skills were not taught in PBL, so working consistently throughout the semester is highly recommended. The subject also gives you a flavour of what it is like working in the area of law.

Subject content

Throughout this subject, you gain knowledge on the types of companies, decision-making in companies, shareholder rights, directors' duties and agent law.

For example:

- If directors make decisions to purposely benefit themselves (such as give themselves shares with 10 times the normal voting power), what can shareholders do to defend themselves?
- What can a poor director do if all the other directors suddenly gang up on that person and kick them out of the company?
- When am I doing dodgy business if I purposely award a contract to my friend but will secretly get a kickback?
- Some other director in the company screwed up! When will I also be in trouble for his dodgy actions even when I didn't do anything?

Lectures

Helen is an excellent lecturer who genuinely cares for her students. Her explanations are very clear, and she tries to make the lecture material easy to understand and not dry. In Weeks 8 and 12, she does not teach any new material, but instead goes through a past exam question to show students how the different concepts are intertwined and how many different legal issues may arise from the one scenario—sometimes directors doing one dodgy thing can mean they're in trouble for numerous reasons! To get the most out of these special lectures, it is highly recommended to try analysing the scenario beforehand, even if it means jotting down a few broad areas of law that you think are applicable. This way, once Helen fully analyses the scenario, you are able to clearly evaluate how you're approaching the analysis and how to improve. You will need to do this in the exam, so this is a valuable exercise in preparation for the exam.

Unlike Graham Richards' lecture slides (from ECON10003 *Introductory Macroeconomics*), Helen's slides are very condensed, so it is advised that you make lots of notes for yourself. It is imperative to understand the law and key concepts every week because many of the lectures extend upon the previous lecture's material, so it can be easy to fall behind on a whole topic if you do not understand something from the week before.

Tutorials

Tutorial attendance is not compulsory but highly recommended and imperative to success in the subject. During tutorials, the tutors discuss the answers to the tutorial questions (which are available at the start of the semester in the subject guide). Towards the end of semester, the tutors may also ask you to work in groups, write up answers, and provide feedback on the way your answers are written up.

It is essential to practise writing out answers to the questions, as most of the marks will come from how you write up your answer and whether you have reasoned your way through logically and with sufficient evidence using legislation and cases. Unfortunately, while some people have a good understand of the material and can draw the right conclusions for a scenario, they are unable to demonstrate their knowledge during the exam due to a lack of practice in law writing.

NB: Answers to the tutorial questions are not released on the LMS, so that is another incentive to go to your tutorials.

Assignments

In my semester of completion, the assignment was given in Week 2, and we had the mid-semester break to complete it. The assignment is very similar to the exam. The lecturer gives a scenario, and there are a few questions that require the application of legislation and cases learnt in the first four weeks of semester. There is a very strict word limit, and the 10% rule did not apply.

I would recommend reading through the assignment and highlighting key words when it is released, because the lecturer often drops hints about the assignment during the first four lectures. The assignments are marked to a high calibre, so ensure that all legislation is correctly quoted and used to back up any arguments you make. You should find yourself using up all 1000 words, and if you are significantly under the word limit, it is advised that you further expand your explanations, even if it seems like you are stating the obvious. (On a side note, if you have learnt Gambotto's case leading up to the assignment, it is almost guaranteed to be on the assignment. It may not be obvious, especially if directors are tampering with shareholders' rights.)

End-of-semester exam

The exam is very similar from year to year (past papers are provided) and similar to the tutorial questions, so there will be no surprises. It is open book and you can bring an unlimited number of notes and books. You can also bring in blank pieces of paper, answers to tutorials, the lecture slides—literally whatever you want. However, bear in mind that you don't want to bring so much that your exam table is flooded with paper and you can't find what you need. Once you practise analysing the scenarios, you may find that the lecture slides are not the easiest way to summarise all the course content. The lecturer recommended that we make topic summaries and answer templates with all the relevant legislation included. I personally found this to be very helpful in the exam.

The exam is 2 hours, with an additional 30 minutes noting time. During noting time, you can write whatever you want on your notes or exam, so long as you do not touch the script book. Overall, the exam is tight for time, as there is a lot to analyse, so having answer templates is very helpful in being efficient. If you practise throughout semester, you will definitely be rewarded in this subject.

COMP20005 Engineering Computation

Exemption status	None.
Lecturer(s)	Semester 1 Professor Alistair Moffat Semester 2 Dr Jianzhong Qi
Weekly contact hours	3 × 1-hour lectures 1 × 2-hour workshop
Assessments	Individual assignment, due in Week 9 10% Individual assignment, due in Week 12 20% 30-minute mid-semester test in Week 7 10% 2-hour end-of-semester exam 60%
Textbook recommendation	Moffat, A. (2012). *Programming, Problem Solving and Abstraction with C* (2nd ed.). Frenchs Forest, AU: Pearson Education Australia. Though it is not essential, the textbook does provide an extensive list of exercises and detailed explanations for various concepts. It also goes a bit further than what is covered in the semester for those who are serious about learning programming. ✓ Strongly recommended.
Lecture capture	Yes (both audio and video).
Year and semester reviewed	2015 Semester 2

Comments

Remember that question in MAST10008 *Accelerated Mathematics 1* where you were required to find the nth rational number? The solution for this problem (outside of brute-forcing it) was to simply get a program to do it for you!

When working with computers, being able to program is an invaluable skill. Odds are most of you reading this will end up working with a computer for a large portion of your life (probably with Microsoft Excel). COMP20005 Engineering Computation provides an excellent introduction to the toolkit most programming languages utilise.

Subject content

This subject focuses on the programming language of C—a procedural language that is used in a broad range of fields, including computing, engineering, and scientific calculations. The subject's content can be divided into two sections.

- The "Computation" — The Programming Toolkit [Weeks 1–8]

  The programming toolkit and how it is implemented in C is covered in the first section of the subject. Number manipulation, selection, loops, functions, as well as pointers, arrays, strings, and structures are covered, allowing you to solve a plethora of problems (e.g. what is the sum of the first 1000 prime numbers?).

- The "Engineering" — Problem Solving Strategies & Miscellaneous [Weeks 9–12]

Numeric approximation techniques, interpolation techniques, and differential equations are all covered, equipping you with a number of different strategies for tackling problems. Actuarial students may be familiar with some of the techniques covered here, such as Gaussian elimination from MAST10008 *Accelerated Mathematics 1*, and fixed-point iteration from MAST10009 *Accelerated Mathematics 2*. You will be expected to be able to explain each technique, as well as any limitations any of them may have.

The method in which a computer stores numbers (aka binary representations) is also covered and may uncover some of the mysteries you encountered earlier in the semester (e.g. why does 2147483647 + 1 give me a negative number?). You will be expected to be able to write a decimal number in binary (both twos-complement and floating-point), as well as convert binary representations back into decimal numbers.

Near the end of the semester, there is a brief introduction to memory allocation, function pointers, recursive data structures, and more. This content is beyond the scope of the subject and is not assessed but is interesting nonetheless. If you are serious about learning programming you might want to take notes.

This subject uses the freeware JEdit—a text editor commonly used for a variety of languages, not just C. While you are not forced to use JEdit over other text editors such as notepad++, it helps when following along with the lecturer's in-lecture programming shenanigans and is fairly user-friendly.

Lectures

In 2015 Semester 2, the lecturer took great care to address students' concerns and took feedback very seriously throughout the semester. He regularly gave real life metaphors for the programming techniques covered and cracked a few jokes (with mixed reaction from the students), which greatly helped with the understanding of the content.

At times the lecture capture was unstable, with audio occasionally being omitted from recordings. Despite this, I felt no pressing need to attend lectures until the final 4 weeks of the semester, as the first 8 weeks of the semester was based off of content in the textbook, which was more than sufficient.

Semester 1's lecturer (who is also the author of the textbook) is apparently amazing—enough for him to get a fanpage. Overall, you are unlikely to have a bad lecturer for this subject.

Workshops

Workshops are 2 hours long, consisting of a brief recap of the content of the previous week followed by some programming exercises. The recaps often gave tips and different perspectives on the various topics throughout the semester, which was helpful for digesting some of the content. Programming exercises were taken straight from the textbook, with **sample** solutions being provided at the end of the week (I stress sample since there are many different ways of doing each problem). This is your only opportunity to find worked solutions for select problems from the textbook. I strongly recommend attending workshops in the last few weeks during the "engineering" topics, when the brainpower required for the subject increases (though that is not to say that you should not attend your workshops before then).

Additionally, there is an online discussion forum (similar to the Online Tutor, but without the anonymity), where students are able to ask and answer questions about the course content. I understand that the actuarial cohort is

typically timid when it comes to asking questions, but it is still helpful to see the answers to questions others have posted.

Assessment

The assessment tasks involve the manipulation of input data (from a text file) to produce a prescribed output. The output of your program and the lecturer's program will be compared (with their own test files), and the smallest difference will result in penalties. Additionally, the presentation of your code and your method used are scrutinised. Receiving full marks is difficult, as the rubric for marking is somewhat extensive and subjective at times. Despite this, the average for both assignments hovered around 85%.

Timed assessments come in the form of a mid-semester test and an exam. The mid-semester test consisted of a true-or-false section and some programming challenges, where students were required to handwrite code that had a specific purpose. The exam had a multiple-choice section, programming challenges, as well as a short-answer section which focussed on the problem-solving techniques covered in the latter portion of the subject.

Like most subjects, you should do well if you have diligently kept up with the subject. Handwriting code may be a bit awkward to have to deal with. However, nothing can be done about that, as laptops and computers are not allowed for tests. If you are extra keen for marks, you can handwrite all of your responses to the questions in the textbook and check them on a computer if you would like extra practice for the exam.

Also, there appears to be a large discrepancy between the style and format of assessments between Semesters 1 and 2, but that should not affect your studying.

Suitability for breadth

The benefits of taking a programming subject will continue to manifest itself in various places, including, of course, your studies and your work.

Any programming subject will generally lend itself to be a simultaneous exercise of logical and critical reasoning. For the actuarial student whose degree will (eventually) swim around highly technical areas, the benefits of this subject are obvious—not that you are learning any maths in the actuarial course, but the thought process of sequencing and debugging code has an overlap with the skills used when you solve a maths problem. (Note that simulation and numerical approximation techniques **are**, however, a part of the actuarial course, and you will be introduced to the basic principles in this subject.)

Moreover, comfort in being able to arrange a problem effectively into smaller, simpler problems is sure to be useful even outside your studies, and in this subject the skill is practised extensively.

While not everyone may find programming a daily activity in the office, machine automation is a highly integral process central to any project which may deal with analysis of large amounts of data (the so-called "big data"). As you have probably grasped, actuaries would very commonly be involved in such work. Programming is also central to quantitative finance; you would do well to gain some prior experience before considering entering such a field.

Students in this subject tend to come from engineering (surprise surprise), computer science, physics, or maths backgrounds. There do tend to be a few commerce students; in my semester of completion, I recognised a few familiar faces from Actuarial Studies.

Students who enjoy the challenge of a good logical puzzle will find themselves very comfortable in this subject. Regardless of your skill and background in programming, this subject will likely stop you in your tracks at some stage with a very worthwhile problem.

Tips for success

For those of you who decide to do this subject, I have a few tips for success:

- Keep up with the subject (can be applied to all subjects, but more so with this subject)
  - Programming is like learning an instrument; you cannot learn it well overnight.
  - Cramming may work for other subjects, but it is impossible to do effectively for this subject.
- Have the goal of learning a rewarding and valuable skill, rather than focussing on marks.
  - Do not be afraid to mess around and try to make wacky programs that do nonsensical things, as even these will develop your skills in programming.

COMP20005 Engineering Computation is a good kick-start to your journey with programming and one of the more practical breadths you can take. The content here will complement other subjects such as MAST20004 *Probability* and MAST20005 *Statistics*, both of which also utilise programming languages.

ECON20002 Intermediate Microeconomics

Exemption status	None.	
Lecturer(s)	Summer Semester	Ms Svetlana Danilkina
	Semester 1	Dr Reshad Ahsan
Weekly contact hours	Summer Semester	2 × 2-hour lectures 2 × 1-hour tutorials
	Semester 1	2 × 1-hour lectures 1 × 1-hour tutorial
Assessments	Tutorial attendance and participation	10%
	30-minute online multiple-choice test	10%
	2 individual assignments	2 × 10%
	2-hour end-of-semester exam	60%
Textbook recommendation	Pindyk, R.S., & Rubinfield, D.L. (2013). *Microeconomics*. Harlow, UK: Pearson Education Limited. Many students do exceptionally well without knowing what the front cover of this textbook looks like, so it is not essential.	
Lecture capture	Yes (both audio and video).	
Year and semester reviewed	2015 Semester 1	

Comments

For the more maths-inclined student (i.e. most of the people reading this), this subject may be more enjoyable than its first-year counterpart.

All of the topics in ECON10004 *Introductory Microeconomics* are touched on, and some of those topics will be explained further.

Subject content

Following an explanation of the use of models and a brief revision session of the content in ECON10004 *Introductory Microeconomics*, the following topics are covered. They are loosely categorised for your viewing pleasure.

1. Consumer Preferences — Lectures 3–10

   How does a consumer allocate their limited budget among 2 goods? This is derived from the consumer's satisfaction from a given combination of 2 goods, the consumer's income, and the prices of the two goods. Behaviour of consumers in the event of uncertainty closes out this topic.

2. Theory of the Firm — Lectures 11–16

Given a firm's budget, in a perfectly competitive market, how can they allocate their resources between capital and labour to produce the optimal amount of output? How a firm minimises their cost for a given level of output as well as how a firm maximises profit are explored.

3. General Equilibrium — Lectures 17 & 18

   Often when welfare is gained by one consumer, welfare is lost in another consumer (as the market for different goods may affect each other). This is explored here with the use of Edgeworth boxes and the concept of Pareto efficiency. Arguably the trickiest part of the subject.

4. Monopolies and Oligopolies — Lectures 19–22

   The social cost of monopolies is explored initially, before moving onto how monopolies maximise profit, as well as various interventions that can be used to maximise social welfare. Oligopolies cap this section off, showing how multiple firms (ECON20002 Intermediate Microeconomics deals with only 2 firms) with a bit of market power compete, combining game theory with profit maximisation.

In terms of mathematical ability, be prepared for plenty of algebra and (partial) differentiation, as well as working with tangent lines.

Lectures

If ECON10003 *Introductory Macroeconomics* left a bad taste in your mouth, be assured that the second-year economics subjects more than make up for it.

Reshad talks through the lectures slides, explaining and elaborating on concepts as they appear. Very simplistic examples for the various concepts are spoken through, allowing the vast amount of content to be digested relatively easily.

Slides are posted about a week in advance, leaving you plenty of time to print slides and bring them to lectures. Some formulae have elements omitted and unanswered questions are peppered around the slides to encourage you to come to lectures, but these are shown in lecture recordings, so attendance is not necessary.

All in all, the lectures are amazing. Reshad was a fantastic lecturer, being able to explain the concepts clearly and use a plethora of examples.

Tutorials

ECON20002 Intermediate Microeconomics tutorials follow the same structure as its introductory counterpart; pre-tutorial work consists of a "blue sheet" (handed out in the previous tutorial, or in the first lecture for your first tutorial) and tutorial work is covered in "pink sheets" (handed out during the tutorial). Unlike previous economics subjects, there is very little difference in the difficulty of questions between the two, allowing for a myriad of practice problems come exam time.

Ultimately (like all subjects), your experience in tutorials will depend on your tutor. Some tutors like to go through each question on the pink sheet as a class, while others give you time to finish the questions before writing them up on the board and explaining the working out.

Tutorials commence in Week 2.

Assessments

The 2 assignments really test your ability to work with variables (rather than numbers). The questions covered are a leap in difficulty compared to examples covered in lectures and tutorials, and the questions may seem extremely intimidating at first. Mathematical prowess alone will not guarantee a good mark for assignments. You are expected to be able to provide economic intuition (which may not be obvious initially) for the conclusions you come across in assignments.

You have the option to form groups of up to 4 students in your tutorial; however going solo is also acceptable. Be prepared to use the mathematical equations tool in Microsoft Word (or if you want to impress your tutors, use LaTeX).

The online mid-semester multiple-choice test (MCT) has a time limit of 30 minutes, just like in ECON10004 *Introductory Microeconomics*. It has a good mix of both theory and calculation questions. It has plenty of "tricky" questions that really test your understanding of the topics (as do most MCTs). It covers all of the topics in consumer preferences.

The exam consists of 10 multiple-choice questions, 2 "easy-ish" short-answer questions (similar to the pink and blue sheets) and 2 "trickier" short-answer questions, which extend on content covered in tutorials and lectures, testing your understanding of the core concepts. You are allowed to have a foreign language/English dictionary as well as a non-programmable calculator (unlike ECON10004 *Introductory Microeconomics*).

Do not be lulled into a false sense of security by past exams. The 2015 exam paper for ECON20002 Intermediate Microeconomics was much harder than in previous years, so be prepared for anything. (Just a tip in general: do not try to assume that the difficulty of an exam will be the same as it was in previous iterations of the subject).

Suitability as an elective

Ask yourself:

- Did you like ECON10004 *Introductory Microeconomics*?
- Are you willing to put in a non-trivial amount of effort into a breadth/elective subject?
- Are you comfortable with mathematics? (This is mainly a rhetorical question.)

If you answered no to any of the above questions, then this subject probably is not for you. Whilst you might be comfortable with mathematics, relating the mathematics with economic intuition is not always straightforward. Despite that, ECON20002 Intermediate Microeconomics is a fulfilling subject.

FNCE30007 Derivative Securities

Exemption status	None.
Lecturer(s)	Weeks 1–6 Dr Jonathan Dark Weeks 8–12 Professor Federico Nardari There were no lectures held in Week 7.
Weekly contact hours	1 × 2-hour lecture 1 × 1-hour tutorial
Assessments	Mid-semester test 25% 3-hour end-of-semester exam 75%
Textbook recommendation	Hull, J.C. (2013). *Fundamentals of Futures and Options markets* (8th ed.). Harlow, UK: Pearson Education Limited. ✓ The textbook is recommended—it contains many practice questions and good explanations.
Lecture capture	Yes (semester 1 only; both audio and video).
Year and semester reviewed	2015 Semester 2

Comments

FNCE30007 Derivative Securities is one of the three third-year subjects required to obtain a Finance major. It is a good elective to take for anyone who wants to keep the Finance major pathway option open, enjoyed the derivatives part of FNCE20001 *Business Finance*, or wanting a bit of a challenge.

Subject content

Subject content varies slightly from semester to semester but usually consists of:

- Forward and futures contracts: the basics, hedging, and basis risk
- Options: the basics of European and American options, valuation using the binomial model, and Black–Scholes–Merton Model
- Historical and implied volatility, the Greeks, and portfolio insurance
- Interest rate swaps (dependent on the lecturers)

Lectures

Lectures are not as scary as people make them sound, but it is crucial to stay on top of the material from week to week. The lecturers do not rush through and take their time to explain the concepts. Overall the lecture quality is very good. There was no lecture capture during the semester I took it, but Semester 1 had lecture capture.

Tutorials

Tutorials are crucial to attend, although no attendance is recorded. I personally found that the tutorials extended my knowledge and gave me a chance to really understand the material. Attempting the questions before the tutorial is recommended. The thing with Finance is that there is a tendency to underestimate the difficulty of the exams and mid-semester tests because the lecture examples are relatively straightforward. In the tutorials, some questions have slight tricks. Some tutors are especially good at pointing out the potential pitfalls and traps that are set. (They ended up turning up in the exam!)

Mid-semester test

Usually there are no practice tests for the mid-semester test, so the best way to prepare for it is to go through lecture examples and tutorial questions. Make sure to learn everything, and be crystal clear about the definitions of terms. (I assumed something was too simple and methodical to be tested in an exam, but it came up on the mid-semester!) The difficulty of the mid-semester can be up to the lecturers, but usually they are very tricky, not difficult. A formula sheet is given.

End-of-semester exam

Again, the exam difficulty can fluctuate from being quite straightforward to being extremely difficult. The best way to study for the exam is again thorough understanding of the lecture examples and tutorials. A formula sheet is given, as well as normal distribution tables. It is important to show all working out and understand the theory behind the formulas. If you try to understand the formulas and the intuition behind the concepts, the subject is overall accessible and definitely rewards those students who put in the hard work.

GERM10008/GERM20001/GERM30021 German 7

Exemption status	None.
Lecturer(s)	There are no lectures in this subject. There was only one tutor, and that tutor also took the seminars.
Weekly contact hours	1 × 2-hour seminar 1 × 1-hour tutorial
Assessments	Essay written outside of class, due in Week 3 Essay written in class in Week 6 in 2 hours 30% 1-hour listening comprehension test in Week 5 1-hour listening comprehension test in Week 10 20% 3–5-minute oral presentation in Weeks 9–11 20% 2-hour end-of-semester exam 30% This subject has hurdle requirements: • Regular participation in tutorials is required with a minimum of 75% attendance. • All pieces of written work and listening comprehension exercises must be completed and the oral presented to pass this subject.
Textbook recommendation	Buscha, A., & Szita, S. (2011). *B-Grammatik: Übungsgrammatik Deutsch als Fremdsprache: Sprachniveau B1, B2*. Leipzig, DE: Schubert Verlag. My tutor told me it wasn't necessary, but they may have changed up the subject in 2016. My suggestion is to go to class or email the co-ordinator for the subject and ask if it's necessary. If you need the textbook, you will have to buy it from Co-op anyway, as it is a workbook.
Lecture capture	There were no lectures.
Year and semester reviewed	2015 Semester 1

Comments

GERM10008 German 7 is a subject for students who have intermediate knowledge in the German language, and aims to extend the students' knowledge in areas of culture, as well as improving the students' speaking, listening, comprehension, written expression, and verbal communication. It is for students who have done well in German as a VCE subject and is ideal for those who have achieved a study score of over 38 in the subject. German 7 is a subject which emphasises the ability to self-learn, so how much you want to get out of the subject will depend on your willingness to learn.

When you choose a language to study for the first time at the University of Melbourne, you are required to complete a placement test. It is essentially a test which measures your basic abilities of the language. The test involves filling in the gaps and selecting words which don't fit in in a paragraph. The test is conducted under a time limit, and as soon as you finish the test, you will receive a German subject which you can register in. If it says German 7, then

you can register in German 7.

It is important that you complete this test well in advance of the first week.

Also, because not many people do German 7, classes will have a combination of students in their first, second, and third years.

Subject content

In German 7, the content which is explored includes communications media, consumer culture, pollution, sustainability, and cultural greetings, and these topics will be assessed in the essay section of the exam. Overall, the content of the subject is not difficult. The topics discussed can easily be understood, and terminology is kept to a minimum. The difficulty lies in being able to express ideas relevant to the topic effectively through written expression and being able to justify your opinion on issues.

During Weeks 1–4, consumer culture and communications media are explored. There are topics such as impulse buying (buying items you don't need), supermarket strategies to encourage shopping (having cheap items like milk or bread, manipulation of lighting, and playing music), and young people's use of social media.

During Weeks 5–8, topics such as pollution and renewable energies will be covered. An area that will be studied extensively in these weeks will be the bin sorting system in Germany. This will then lead to the other topic of sustainability, where themes such as renewable energy will be discussed.

During Weeks 9–12, the topic that will be discussed is cultural greetings. During Week 12, there will be exam preparation. You will be inspecting a past exam, which will be very similar to what will actually be on the exam.

Tutorials

The tutorials are split into a 2-hour seminar and a 1-hour conversation tutorial. It is expected that German will be spoken most of the time, with minimal assistance from the English language.

During the first part of the 2-hour seminar, you will read articles provided in German and answer questions on the text. There will be some discussion in groups, and some discussion with the class as a whole, with written responses to the text kept to a minimal. The articles will mainly focus on broad themes relevant to German-speaking societies including communications media, consumer culture, and pollution. Although participation is not assessed and you only need to have a 75% attendance rate, staying engaged and speaking in class is very helpful to make sure you understand what is going on, and contributing in class will allow you to receive feedback on your responses.

The second part of the 2-hour seminar involves learning grammar. You will be given exercise sheets, and have to fill in the blanks. Topics include passive voice, subordinating and coordinating conjunctions, and adjective endings (it's not as easy as it sounds, as more difficult scenarios are considered).

The conversation tutorial encourages students to speak in German in groups and as a class according to the ideas explored in the seminar. Videos may also be shown here, which will be discussed afterwards.

Tutorial content will be highly relevant to the exam, where the themes explored in the seminars will be assessed in the essay. There will also be a grammar section based on grammar explored in the seminar.

Assignments

The first assignment will be a hand-in essay of approximately 500 words. When I did the essay, the theme was consumer behaviours, and I had to discuss my personal experiences as to how supermarkets may induce me into impulsive purchasing. It may sound a bit confusing here, but once you read the scenario, it will be a straightforward task. The few big things to watch out for here is to not make any simple mistakes such as verb–subject agreement and positioning of verbs in a sentence. It will undermine an otherwise good essay, and the tutor hates it. After receiving your essay back, make sure to discuss it with the tutor. This will help you write better essays later on in the subject.

The second assessment will be a listening comprehension test. When I first did the test, the words flew right pass my head. I suggest that you read the question carefully so that you can listen out for key bits of information. If you are unable to answer a question based on the listening, take a guess. It may be more accurate than you think. There isn't really any way to improve your listening comprehension skills quickly. There are German broadcasting radios which you can check out. SBS radio has a dedicated German section during 7–8pm. Listening to this might help you feel more comfortable with the listening comprehension.

The third assessment will be an in-class written essay. The time limit is 2 hours, which quite honestly is enough to write the 500 word requirement. No dictionaries are allowed so make sure you have a clear understanding of the themes discussed in previous seminars, as the content will be linked with the essay topic. Again, double-check and triple-check that you haven't made any simple mistakes which the tutor will frown upon.

The fourth assessment will be the second listening comprehension. This listening was much easier than the first one, but I'm not sure if that was intentional. Again, not much to do here except perhaps listening to some German beforehand.

The fifth and last assessment will be the oral. The oral that I had to do was based on cultural greetings, such as handshakes, bows, and kissing someone's hand. You have to research a greeting, which you can choose for yourself. I suggest that you complete your speech as soon as possible, and practise it as much as possible. The tutor is really big on making the speech sound natural and may take marks off if they think you are just reciting a speech, so make sure your presentation comes out naturally, and you may find it advantageous to stumble at points and think for a little moment to give the impression you are trying to express something which you momentarily cannot put into words.

The exam is split into two sections: a grammar section and an essay. The time limit is 2 hours, but many student were leaving the venue at the 1.5-hour mark. The grammar section will be based on work done in the seminar. The grammar section shouldn't take too long, as you will either know what to do or you won't know. For the essay, you will have a choice between three scenarios. It is important to get the structure correct (are you writing an article, speech, or email) and the style of writing (persuasive, evaluative, personal). It helps to have written a few practice essays before the exam and showing it to your tutor to get feedback. Overall, the exam is quite straightforward and if you understand the content and grammar, you will be fine.

Concluding remarks

German and actuarial studies may seem like two highly unrelated areas of study. However, learning how to self-learn and having the initiative to speak up are skills which will definitely help in tackling the more difficult subjects which you will face, and you may find yourself better prepared than others in searching for resources to assist with

your learning. I can speak from experience that many students doing the actuarial subjects are reluctant to speak out, and I was the one who had to consistently answer questions and enter into discussions.

List of Exemptions

Table 1: Actuaries Institute exemption subjects and corresponding university subjects

Exemption subject	University subject
Part I	
CT1 Financial Mathematics	ACTL20001 Financial Mathematics I ACTL20002 Financial Mathematics II
CT2 Finance and Financial Reporting	ACCT10002 Introductory Financial Accounting FNCE20001 Business Finance
CT3 Probability and Mathematical Statistics	MAST20004 Probability MAST20005 Statistics
CT4 Models	ACTL30001 Actuarial Modelling I ACTL30002 Actuarial Modelling II
CT5 Contingencies	ACTL30003 Contingencies
CT6 Statistical Methods	ACTL30004 Actuarial Statistics ACTL40002 Risk Theory I
CT7 Business Economics	ECON10004 Introductory Microeconomics ECON20001 Intermediate Macroeconomics
CT8 Financial Economics	ACTL30006 Financial Mathematics III ACTL40004 Advanced Financial Mathematics I
Part II	
Part IIA The Actuarial Control Cycle	ACTL40006 Actuarial Practice and Control I ACTL40007 Actuarial Practice and Control II
Part IIB Investment and Asset Modelling	ACTL40009 Actuarial Practice and Control III

Source: Centre for Actuarial Studies
Current as of 14th November 2015.

Equivalent Graduate Subjects

Subjects offered as part of the 2-year MC-ACTSCI *Master of Actuarial Science* or 2-year MC-COMACSC *Master of Commerce (Actuarial Science)* degrees allow graduate students to gain professional actuarial exemptions from the Actuaries Institute. Due to the overlap in content between these subjects and actuarial subjects offered as part of the B-COM *Bachelor of Commerce* and the BH-COM Honours program, we have listed graduate actuarial subjects with their undergraduate counterparts below. The reviews for undergraduate subjects included in the *Actuarial Students' Society Subject Review* will serve as an accurate reference of the content in the corresponding graduate subjects.

Some of these graduate actuarial subjects will share the same lectures as their undergraduate counterparts, as in Table 2. Others will just contribute to the same exemption subject as their undergraduate counterparts (and hence have common content), as in Table 3.

Table 2: Graduate and undergraduate actuarial subjects with common lectures

Graduate subject	Undergraduate subject
ACTL90003 Mathematics of Finance III	ACTL40004 Advanced Financial Mathematics I
ACTL90004 Insurance Risk Models	ACTL40002 Risk Theory I
ACTL90009 Actuarial Practice and Control III	ACTL40009 Actuarial Practice and Control III
ACTL90010 Actuarial Practice And Control I	ACTL40006 Actuarial Practice and Control I
ACTL90011 Actuarial Practice and Control II	ACTL40007 Actuarial Practice and Control II
ACTL90014 Insurance Risk Models II	ACTL40003 Risk Theory II
ACTL90015 Mathematics of Finance IV	ACTL40008 Advanced Financial Mathematics II

Table 3: Graduate and undergraduate actuarial subjects with common exemption subjects

	Graduate subject	Undergraduate subject
CT1	ACTL90001 Mathematics of Finance I	ACTL20001 Financial Mathematics I ACTL20002 Financial Mathematics II
CT4	ACTL90006 Life Insurance Models I ACTL90007 Life Insurance Models 2	ACTL40002 Risk Theory I ACTL40003 Risk Theory II
CT5	ACTL90005 Life Contingencies	ACTL30003 Contingencies
CT6	ACTL90008 Statistical Techniques in Insurance ACTL90004 Insurance Risk Models	ACTL30004 Actuarial Statistics ACTL40002 Risk Theory I
CT8	ACTL90002 Mathematics of Finance II ACTL90003 Mathematics of Finance III	ACTL30006 Financial Mathematics III ACTL40004 Advanced Financial Mathematics I
Part IIA	ACTL90010 Actuarial Practice And Control I ACTL90011 Actuarial Practice And Control II	ACTL40006 Actuarial Practice and Control I ACTL40007 Actuarial Practice and Control II
Part IIB	ACTL90009 Actuarial Practice And Control III	ACTL40009 Actuarial Practice and Control III