



SUBJECT REVIEW
2015

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Acknowledgements:

We would like to thank the following people for their contributions to the first edition of the Actuarial Students' Society Subject Review:

Saurav Acharya, Travis Barr, Holly Briffa, Cuong Duong, Chris Ebeling, Catherine Huang, Amy Li, Margaret Loo, Matthew Tsiglopoulos, Anita Voon, Mengtong Xia and David Zhang

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.

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Introduction

Many actuarial students are left bewildered by the varying complexity and nuances of the actuarial course path and its individual subjects. Our aim is to bring light to the CT subjects embarked upon during the standard course path for a student of the University of Melbourne. Most students who undertake the actuarial major are accustomed to, and do expect, a high level of mathematical rigour yet are not accustomed to having to extend their reach for certain actuarial subjects in not only their study, but also their way of thinking. With a variety of students contributing to the collection of reviews, we hope to provide a broad spectrum of ideas and opinions and to offer a new perspective on each subject. What must be remembered however, is that these reviews are opinions, which can be subject to fault and bias, and provide in no way a hard and fast truth. Taking each opinion as it is, merely an opinion and an individual's point of view, will hopefully give students a taste of what is to come and provide an indicator as to whether they're suited to or fully prepared for a particular subject. Please also note that the structure and content of subjects may change from year to year – consult the University subject handbook for the most up-to-date information about a subject.

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

Happy studying! 😊

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Level One Subjects

ECON10004 Introductory Microeconomics

Exemption subject and CT: Yes, CT1 along with Intermediate Macroeconomics

Lecturer(s): Jeff Borland

Number of lectures and tutorials: Two 1 hour lectures and one 1 hour tutorial each week.

Assessment: Two assignments (each 10%), two online multiple choice tests (each 5%), tutorial participation (10%), final exam (60%)

Textbook Recommendation: The prescribed textbook is very useful and it is okay to get any edition. The case study written by Jeff Borland is helpful too.

Lecture Capture: Yes. The lecture capture is very helpful. Jeff writes notes very clearly and there is almost nothing you will miss. Lecture capture is a very good substitution to lectures but it is still recommended that you attend all of the lectures.

Year and semester of completion: 2014, Semester 1

Description of subject content:

There are a few concepts that will be gone through in lectures throughout the course. First, there is the basic demand and supply model which most students should be familiar with if you have done economics in high school. Then there are the concepts of market failure, externality, marginal revenue and marginal cost, competition, price determination and lastly, game theory.

Students should be able to discuss both the short run and long run consequences if there is a change in the market using different concepts.

Comments:

Positive aspects:

- Jeff Borland is a very good lecturer. He explains very clearly and the notes he prepares are usually very informative and systematic.
- It is a relatively easy CT subject and most students should be able to get above 73%.
- Consultations and tutorials are always very helpful if you encounter any problems.

Negative aspects:

- Even though it is a relatively easy subject, a lot of students underestimate the subject and don't do enough study.
- The typical exam questions may seem simple when you first look at them but there is a lot more detail to them that students are expected to explain clearly in their responses.

Workload:

Most tutorial work can be finished within 30 minutes if you understand the concepts well, it may take longer if you are not so clear with the concepts. Students will generally spend a few hours each week on reading textbooks and studying lecture notes. However, it is very important that you also study the blue and the pink sheets after each tutorial. At the end of the semester, if you are confident with the problems presented in the blue and pink sheets and past exams, you should be confident with the final exam. Each week you should spend around 9 – 10 hours on this course including lectures and tutorials.

Rating: 4.5 out of 5

ACCT10002 Introductory Financial Accounting

Exemption subject and CT: CT2 along with Business Finance

Lecturer(s): Gregory Cusack

Number of lectures and tutorials: Lectures are 2 hours long and held once a week. There is also a 1 hour tutorial once a week.

Assessment: Assignment (25%), participation (5%), final exam (70%). Note that the exam is a hurdle, you will need to obtain at least 50% on the final exam to pass the class.

Textbook Recommendation: You don't need it. It is a compilation of chapters from other textbooks. There is no table of contents and no glossary of terms. There is no continuity in the chapters. Very useless as a reference. If you want to read it, check it out from the high usage section of the Giblin Eunson library.

Lecture Capture: Lecture captures are not so bad. But some of the examples worked in class are not shown in detail. Make sure to attend if you are not confident on the week's material.

Year and semester of completion: 2014, Semester 2

Description of subject content:

You will be learning about the major accounting rules and regulations at the start of the course. There will be a large assignment based on this material. The remainder of the course will be spent on learning how to write journal entries and balance t-accounts. Much emphasis is put on the matching principle and you will be doing some reconstruction of accounts at the very end of the semester that aggregates most of the material covered in the course.

Comments:

Positive aspects: Most of the topics are straightforward and easy to learn if you put the time in. If English is not your native language, the lecturer speaks clearly and at a slow pace. There are plenty of drop-in tutorials available throughout the week

Negative aspects: The assignment is worth 25% of your grade for only 1/6th of the course material. If English is your first language, the lecturer will be incredibly slow. Many times the material will not be fully covered within the lecture and left for you to read.

Workload: Most of the tutorial work can be finished within an hour, 30 minutes if you really understand it. There are plenty of practice examples that you should go through; each of these takes between 30 and 60 minutes to complete.

Rating: 3 out of 5

MAST10008 Accelerated Mathematics 1

Exemption subject and CT: None; However, you will need an average of 60% between AM1 and AM2 to continue in the major.

Lecturer(s): Paul Norbury

Number of lectures and tutorials: 4 lectures a week, each 1 hour long. There is a 1 hour tutorial and a 1 hour MATLAB tutorial a week.

Assessment: Assignment (15%), MATLAB test (5%), final 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.

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, 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 subject. 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.

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.

Rating: 4 out of 5

MAST10009 Accelerated Mathematics 2

Exemption subject and CT: Not an exemption subject, but is a prerequisite for Financial Mathematics 1

Lecturer(s): Barry Hughes

Number of lectures and tutorials: 4 x one-hour lectures and 1 x one-hour tutorial per week

Assessment: 2 written assignments (5% each), mid-semester test (10%), final exam (80%)

Textbook Recommendation: Bounded lecture notes + exercises available from the Co-op Bookshop

Lecture Capture: Yes, but the lecturer does all the working out for lecture exercises on the whiteboard, which is not captured

Year and semester of completion: 2014, Semester 2

Description of subject content:

Completing this subject in conjunction with AM1 is equivalent to completing Linear Algebra, Calculus 2 and Real Analysis. This subject covers most of the topics from Calculus 2 (limits, convergence of sequences and series, differential and integral calculus, differential equations) and Real Analysis (proofs of limits and convergence, mean and intermediate value theorem, Taylor and Fourier series). Emphasis is placed on proving theorems and defining properties of functions, differentiation and integration before actually applying them to problems.

Lectures 1-6 cover sequences, convergence of sequences and their proofs, and also theorems such as Bolzano-Weierstrass and the subsequence theorem used for deeper analysis of sequences. The concepts introduced in lectures 5 and 6 are particularly difficult and may require multiple readings to fully understand.

In lectures 7-21, the properties of real functions are developed and their limits, along with differentiability, are defined rigorously. The Mean Value Theorem, Intermediate Value theorem, and Taylor polynomials are introduced here.

Then, weeks 6-10 mainly consist of Calculus 2 topics (hyperbolic functions, differential calculus, integral calculus and differential equations). The last two weeks cover convergence of infinite series, a topic that is straightforward for the most part, but the more complicated notions of Trigonometric and Fourier series are introduced towards the end.

Comments:

In AM2, you are expected to tackle problems in a completely different way to high school maths or even AM1: instead of applying rote-learned formulas, you are expected to construct these formulas from the ground up and use more mathematical reasoning to explain your working steps.

Rigorous proofs of every theorem and formula to be used in the subject are done in the lectures, and then one or two exercises are done on the whiteboard applying these theorems. You can expect many of the proofs to leave you dumbfounded due to the unfamiliar abstract concepts and mathematical manipulation employed. Luckily, only the easier proofs - derived using basic algebra - are asked to be reproduced in assessments. Otherwise, there are proof questions which require the use of theorems such as the Mean Value Theorem or the Intermediate Value theorem.

Barry is a passionate and lively lecturer, but he tends to use mathematical jargon in his explanations, which sometimes makes them hard to understand. In these cases, it is best to look online for a clearer explanation. Also, try to arrive at lectures early to secure front-row seats as the whiteboard writing is hard to see from the back of the theatre.

For the tutorials, a few exercises from each problem set (there is one problem set for every lecture and this is separate from the exercises done in lectures) are chosen for students to do in groups, while the tutor walks around to help/check answers for each group. When the week's exercises were hard, this meant that the tutor didn't have time to help with the last few exercises. This was problematic because, in addition to the lack of worked solutions for the exercises, some questions didn't even have answers. You should be aiming to go to consults to get an idea of how these questions are done.

The marking of this subject is very pedantic: marks can be lost for not stating the theorem used and the correct definition of a theorem/why it can be used. So expect to be doing a fair bit of writing for assignments and the exam.

There are 2 assignments, the first covering convergence of sequences and functions, and the second covering calculus and differential equations. They each contain 5-6 fairly difficult questions, but since you are able to verify answers with classmates/Wolfram Alpha, most of the marks you lose will be for technicalities and not for your final answer.

The mid-semester test may seem daunting at first as it covers the first 5 weeks and there is no sample paper, but Barry sets fair questions that are based off lecture exercises and tutorial problems. In particular, you should aim to revise proofs of basic theorems and their definitions. Cheat sheets are not allowed and formula sheets are not provided.

The final exam covers all topics and five to six past exams are posted online (without answers), but Barry goes over two of the exams in the last two lectures, showing how questions should be answered and where marks are given. The exam structure stays the same from year to year and the questions asked are much simpler than lecture and problem set exercises, making the exam do-able within the 3-hour time limit. However, as with the mid-semester test, there is no formula sheet, hence it is important to know the ideas behind integration and differential equations well, and the key points of every theorem/definition must be memorized.

Overall, this is a very difficult subject due to its vast content and technicalities, but it will improve your logical thinking and give you a good taste of the rigour required in pure mathematics. Although it is a struggle to keep on top of all the problem sets due to their difficulty and the lack of worked solutions, it is definitely necessary to re-read the lecture notes after every lecture and go over the lecture exercises yourself as they contain the main ideas underlying each topic. Consults, study groups and online videos (Khan Academy, PatrickJMT) will be very helpful for this subject.

Rating: 3 out of 5

ACTL10001 Introduction to Actuarial Studies

Exemption subject and CT: Not an exemption subject, but a great introduction subject which covers the basics of Financial Mathematics.

Lecturer(s): Xueyuan (Shane) Wu

Number of lectures and tutorials: 2 x one-hour lectures and 1 x one-hour tutorial per week

Assessment: 2 Excel assignments (10% each), mid-semester test (10%), final exam (70%).

Textbook Recommendation: An Introduction to Actuarial Studies 2nd Edition. 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

Year and semester of completion: 2014, Semester 2

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 analyzing 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 one hour 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 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.

Comments:

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 be 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.

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.

Rating: 3.5 out of 5

Level Two Subjects

FNCE20001 Business Finance

Exemption subject and CT: CT2 along with ACCT10002.

Lecturer(s): Varies. In 2014, the lecturers were:

Summer Semester - Prof Rob Brown

Semester One - Dr Joshua Shemesh

Semester Two - Dr Vincent Gregoire and Dr Sturla Fjesme

Number of lectures and tutorials: Semester One and Two: 1 x one hour tutorial, 2 x one hour lectures per week. Summer Semester: Twenty-four hours of lectures and twelve hours of tutorials

Assessment: Semesters 1 and 2: A 2-hour end-of semester examination (60%), a 1-hour mid-semester test (25%) and periodic tutorial assignments totalling not more than 1500 words (15%)

Summer Semester: A 3-hour end-of semester examination (80%), and a 1-hour mid-semester test or two tutorial assignments totalling not more than 2000 words (20%)

Both the assignments and the mid-semester test are generally multiple-choice, and follow tutorial work closely.

Textbook Recommendation: *Business Finance* (G Peirson, R Brown, S Easton, P Howard and S Pinder), McGraw-Hill, (11th edn), 2012.

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 One, but not in Semester Two.

Year and semester of completion: 2014, Semester 2

Description of subject content:

Broadly, the subject matter covered in the course includes:

- 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
- Introduction to derivative securities.

Comments:

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 math” 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 under-load 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.

Rating: 4.5 out of 5

ACTL20001 Financial Mathematics I

Exemption: CT1 along with Financial Mathematics II

Lecturer(s): Zhuo Jin

Number of lectures and tutorials: Two 1 hour lectures a week plus a 1 hour tutorial

Assessment: Assignment (20%), 45 minute mid semester exam (10%), final exam (70%). Note that the exam is a hurdle, you will need to get at least 50% on the final exam to pass the subject.

Textbook Recommendation: The same textbook is used for both FM1 and FM2 and it is highly recommended that you purchase it. It has well written explanations of all the content covered in FM1 with lots of end of chapter exercises that are good practice for the exam. The book is also relatively cheap (around \$20) so is definitely a worthwhile purchase.

Lecture Capture: Lectures were not recorded in 2014.

Year and semester of completion: 2014, Semester 1

Description of subject content:

The course has a lot in common with the financial mathematics content from “Introduction to Actuarial Studies.”

The first chapter covers the various types of interest – simple interest, compound interest, force of interest, nominal rates of interest and discount, interest varying with time and accumulation factors.

The second chapter examines the valuation of cash flows, looking at annuities in arrear, annuities in advance, continuous payments, increasing and decreasing annuities. A mathematical proof for the existence of solutions to equations of values subject to certain conditions is also explored.

Analysis of investment projects is the topic of chapter three and explores five main techniques: net present value, internal rate of return, discounted payback period, payback period and accumulated profit. Loan contracts and flat rate loan contracts are also covered.

The final topic is a more qualitative analysis of the different forms of investment options such as shares, bonds, futures, forwards and options.

Comments:

A positive aspect of this subject is that Zhuo makes really nice neat weekly summaries and an overall course summary right before the exam. These summaries contain most of the key formulas you will need to know and are very helpful when it comes to doing revision.

In terms of negative aspects, like a lot of actuarial subjects, not much revision material is provided. You will probably receive one specimen exam for practice but no past exams. However, if you want additional practice, you should definitely visit the following link and have a look at the past CT1 exams: <http://www.actuaries.org.uk/students/pages/past-exam-papers>

You won't be able to do all the questions because some of it is content from FM2 but about half the paper covers content from FM1.

The lectures for this subject make the content appear relatively straightforward but don't be deceived. The final exam for this subject can be very tough and requires a very thorough understanding of the entire subject and the ability to perform calculations quickly and accurately. In particular, if you do

not know how to store numbers in your calculator to quicken up the linear interpolation process, then definitely get a friend who knows how to do this to teach you because it will save you a lot of time during the exam and good time management is very important in the final exam.

In terms of assignments, these are to be completed on excel and in groups of 3-5 students. The assignments are not very difficult and are more a way to allow students an opportunity to develop Excel skills rather than to challenge and extend students.

The workload of the subject isn't that intense. Assignments are pretty short and each week you are given 3-5 tutorial problems to work through before you are guided through the solutions during the weekly tutorials. However, familiarity with the course content is very important if you want to do well, so it is also a good idea to try and do the textbook problems throughout the semester as some of these are quite challenging and really do test that you actually understand what you are doing. I would recommend allocating at least 3 hours a week dedicated to doing tutorial problems, reviewing lectures and doing textbook problems.

Overall, I personally really enjoyed Financial Mathematics I. All the formulas you learn fit together in a neat way and the course touches on some very nice mathematical concepts.

Rating: 4 out of 5

MAST20004 Probability

Exemption subject and CT: CT3 in conjunction with MAST20005 Statistics

Lecturer(s): Nathan Ross (subject to change)

Number of lectures and tutorials: three 1-hour lectures, one 1 hour tutorial, one 1 hour computer lab

Assessment: Assignments (20%), final exam (80%).

Textbook Recommendation: See course guide. Fundamentals of Probability by Saeed Ghahramani. Generally not needed. I never looked over it. The lecture notes are comprehensive.

Lecture Capture: Yes

Year and semester of completion: Semester 1, 2014

Description of subject content and 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 tutes 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 a challenging yet entertaining subject and was very well organised.

Rating: 5 out of 5

ECON20001 Intermediate Macroeconomics

Exemption subject: CT7, along with Introductory Microeconomics

Lecturer(s): Professor Chris Edmond

Number of lectures and tutorials: Two 1-hour lecture and 1-hour tutorial per week.

Assessment: A 2-hour end of semester examination (60%), a multiple choice test (5%), two assignments totalling not more than 2500 words (25%), tutorial attendance and participation (10%).

Textbook Recommendation: Olivier Blanchard and Jeffrey Sheen (2013). *Macroeconomics*. 4th Australasian edition. Pearson.

Lecture Capture: Yes, for all 3 streams

Year and semester of completion: Semester 2, 2014

Description of subject content:

The subject covers 5 main topics: Short-run macroeconomics, Labour markets and unemployment, Macroeconomic adjustment, Long-run macroeconomics and Open-economy macroeconomics.

For the first topic, Short-run macroeconomics, the lecture will cover IS-LM model. Then the lecture will move on to cover some unemployment dynamics, the Beveridge curve and job creation curve. For the third topic, Macroeconomic adjustment examines the aggregate demand and aggregate supply curve, Phillips curve and dynamic AS-AD model. The lecture will examine the impact effects and impulse responses of these curves. The topic Long-run macroeconomics will cover some growth theory, i.e. Solow model, absolute or conditional convergence and endogenous growth. During the lecture, we also examine OECD and other countries' growth history. Lastly, Open-economy macroeconomics examines the difference between fixed and floating exchange rates, interest parity and the open economy IS-LM model.

Comments:

Positive aspects: This subject is relatively easy to understand. When you're halfway through the subject, you will realise that most of the models are linked to each other. The exam covers most of the models that were taught in the subject (i.e. one from each topic). Also at the end of the second lecture each week, the lecturer will discuss an exam-like question as a summary of the week's lectures.

Like most of the main subjects for BCom, there are many consultation hours that you can attend if you start struggling with any of the material.

Negative aspects: The assignment questions are quite difficult, so it might take up quite some time to complete them. Though it is difficult, I personally found that the questions are very interesting as the questions are connected to some real life scenarios that we see happening in other countries.

Workload: Blue sheet (pre-tutorial) questions take around 30-60 minutes, depending on the difficulty of the week's lecture.

Rating: 3.5 out of 5

MAST20005 Statistics

Exemption subject and CT: CT3 - Probability and Mathematical Statistics

Lecturer: Davide Ferrari

Number of lectures and tutorials: Weekly: 3 x 1 hour lectures, 1 x 2 hour tutorial/laboratory

Assessment: Assignments (20%), Computer Laboratory Test held during semester (10%), a 3-hour written examination in the examination period (70%). There are three assignments during semester.

Textbook recommendation: Hogg and Tanis, Probability and Statistical Inference. 7th or 8th Edition, Prentice Hall, 2010. Lecture notes will suffice but I do recommend purchasing the textbook if you want more practice questions.

Lecture capture: Yes

Year and semester of completion: 2014, Semester 2

Description of 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 numbers 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.

Comments:

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 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 codes.

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 some 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. There are also a lot of formulas, please do not memorise them but try to understand the ideas behind them.

Rating: 4.5 out of 5

ACTL20002 Financial Mathematics II

Exemption subject and CT: Yes, CT1 along with Financial Mathematics I

Lecturer(s): Mark Joshi

Number of lectures and tutorials: Two 1 hour lectures a week plus a 1 hour tutorial

Assessment: 2-hour end-of-semester examination (70%), two assignments (20%), and a 45 minute mid-semester examination (10%). The final exam is a hurdle and requires at least a 50% pass.

Textbook Recommendation: Compound Interest & its Applications. This is the same textbook as the one used for Financial Mathematics I. The textbook is very good although it does not cover the entire subject. Later topics are only touched on briefly by the book however the lecturer provides supplementary notes.

Lecture Capture: Yes. Lectures were recorded in 2014. This is especially useful for later lectures which start to go over stochastic modelling and time series models, where it can be helpful to review how the lecturer constructs each spreadsheet.

Year and semester of completion: 2014, Semester 2

Description of subject content:

This subject builds upon the content covered in Financial Mathematics I, but unlike FM1, this subject focuses less on computation skills and more on application. Broadly speaking, the subject covers applications in asset markets and applications involving probability theory, which are also the names of the two relevant chapters in the textbook.

Generally one topic is covered per week and these include:

- Discount valuation of assets (e.g. bonds and index bonds, floating rate notes)
- Rates of return on investment portfolios (e.g. time weighted rate of return, money weighted rate of return, linked internal rate of return, Hardy's approximation)
- Interest rate risk (e.g. duration and convexity of cash flows, Redington's Theory of Immunisation)
- Bond market structures (e.g. spot rates, forward rates, term structure of interest rates, arbitrage)
- Simple stochastic models and time series models

Comments:

The lectures are engaging and quite straightforward and the content is also interesting. However, simply understanding lecture content is nowhere near enough for the final exam. This subject is definitely one of the more challenging ones to do well in out of the rest of the second year subjects, especially since you most likely won't be given much revision material or extra practice problems besides from a specimen exam. The UK Institute and Faculty of Actuaries' past papers for CT1 are relevant though and have similar and relevant problems.

There is not a huge workload prescribed for the subject however to fully understand the material does require time going through all the content and making sure there's nothing you are unclear about. Each week you are given around 3-5 tutorial problems of varying difficulty. Tutorials are highly useful for the subject, especially to help you completely understand how to work out the more difficult questions. Tutors systematically work through all problems and often provide valuable tips

and shortcuts. Textbook problems are also very useful for additional questions so completing all of these is highly recommended. The later weeks of the subject place a greater focus on Excel use and you are introduced to the basics of stochastic simulation and time series modelling. It is a good idea to allocate more time to this subject in these later weeks to ensure you are able to not just replicate spreadsheets but also be able to fully understand each step of the process. I would recommend spending at least 3 hours per week on this subject.

You are given two assignments which are not very time consuming but may be different to what you are used to. Like assignments for FM1, they are completed using Excel, however these assignments are generally focussed on “building models”, albeit basic ones with the knowledge acquired throughout second year. These assignments are completed individually and give you the opportunity to start building your Excel skills which are invaluable for future actuaries.

Overall, the subject is an interesting one, teaching you many new concepts as well as extending those from Financial Mathematics I. It's also a tough one to do well in, so work hard!

Rating: 3.5 out of 5

Level Three Subjects

ACTL30001 Actuarial Modelling I

Exemption subject and CT: CT4

Lecturer(s): Shuanming Li

Number of lectures and tutorials: 2 x 1 hour lectures (plus 1 extra lecture every third week), 1 x 1 hour tutorials.

Assessment: 2 group assignments (20%), exam (80%)

Textbook recommendation: Lecture notes

Lecture capture: No

Year and semester of completion: 2014, Semester 1

Description of subject content: This subject mainly deals with the calculations of future life probabilities, particularly the methods of estimation that can be used when the probabilities are not immediately available. For example, finding the probability of survival in between integer ages. The basis of this was covered in Introduction to Actuarial Studies.

Comments:

Positives- This subject goes into more depth than previous actuarial subjects with regards to future life probabilities. This was not really touched on in second year so if you enjoyed it in first year the return to similar material will be welcomed. The depth of the subject is really the main advantage. If you are willing to put in the work and want to challenge yourself you will enjoy it.

Negatives- Many of the lectures are filled with long and difficult proofs. While this in itself is not a bad thing, it can be difficult to follow the lecturer throughout the proofs. Even going through them after in your own time, it can be difficult to understand some of the proofs. This makes the subject challenging and persistence is needed to properly understand the content.

Difficulty- Throughout the lectures the subject is quite difficult and completely understanding the material is hard. To do a lot of the proofs you must completely understand the theory. However, for the exam, such knowledge is not a necessity. It is not that difficult to understand the material on the surface and to a moderate level, and this is all that is needed for most questions. Like other difficult subjects, the material makes a lot more sense at the end, particularly after revision. Make sure you work hard, but don't get scared during the semester. The assignments are relatively difficult and quite long. They will take a while to work through. They are group assignments though, so you should be able to complete them with the help of your group.

Workload- This obviously depends on how much you stay on top of the work throughout the semester. I would definitely recommend to stay as up to date as possible in this subject. Tutorials are far more useful if you have completed them, or at least tried to, before attending. Constantly revising will also help you be as prepared as possible for the exam. I would say 5 hours a week would be a good amount to really stay on top of things. This will increase during weeks where assignments are due.

Rating: 4 out of 5

ACTL30002 Actuarial Modelling II

Exemption subject and CT CT4, along with ACTL30001 Actuarial Modelling I

Lecturer(s): Enrique Calderin

Number of lectures and tutorials: 2 x 1 hour lectures and a 1 hour tutorial per week. An additional 1 hour optional class test is held approximately twice during the semester.

Assessment: Two group assignments (10% each) and one final exam (80%).

Textbook recommendation: A workbook is available from the 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: Lectures were not recorded Semester 1, 2014.

Year and semester of completion: Semester 1, 2014

Description of subject content: This subject is essentially a study of mortality rates. It covers the estimation of mortality rates, the accuracy of these estimates 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
 - Cubic splines
- Markov chains
 - Classification states
 - Equilibrium distributions
 - Application to no-claim discount systems

Comments:

This subject builds upon knowledge from 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 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. Excel is mainly used and is a good introduction into 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.

Rating: 3.5 out of 5

ACTL30006 Financial Mathematics III

Exemption: CT8, along with ACTL40004 Advanced Financial Mathematics I (Honours Year subject)

Lecturer(s): Mark Joshi and Zhuo Jin

Number of lectures and tutorials: 2 x 1 hour lectures per week with 4 additional lectures throughout the semester, 1 hour tutorial per week.

Assessment: Two group assignments (10% each) and one final exam (80%).

Textbook recommendation: Introduction to Mathematical Portfolio Theory by Mark S. Joshi and Jane M. Paterson

Lecture capture: Lectures were not recorded Semester 1, 2014.

Year and semester of completion: Semester 1, 2014

Description of subject content:

This subject's aim is to provide an understanding of the mathematics underlying Modern Portfolio Theory. The fundamental question to be answered is how to choose an investment amongst many possible investment opportunities assuming that the investments are correctly priced. Topics covered during the semester include:

- the objectives of Modern Portfolio theory
- mean-variance efficiency
- Gaussian elimination to find efficient portfolios
- single and multi-factor models for investment returns
- expected utility theory
- Capital Asset Pricing Model
- Arbitrage Pricing Theory
- market efficiency and rationality
- stock price models across time to assess long-term risk in portfolios

Comments:

This subject basically covers how to choose an investment out of many possible investments under various assumptions. It is quite an interesting and engaging subject which provides an introduction to the investment area of actuarial practice.

Tutorial questions are basically a subset of questions taken from the prescribed textbook. Basic solutions are provided at the back of the book, but detailed solutions are given in the tutorials. There are many questions in the textbook for practice so having available questions is not an issue in this subject.

It is very important to understand the concepts. Unlike the other actuarial subjects in first semester, simply practicing many questions will not prepare you well for the exam. Last year, this exam was the most challenging of the whole year and rote-learning standard problems was not useful. Therefore, a focus on thoroughly understanding the concepts covered will serve you well in this subjects.

Assignment are conducted in group format; with the groups assigned by the lecturer. Compared to the tute questions and exam, the assignments are quite straightforward; they are simply a matter of learning how to use complicated Excel formulas to return the desired answers.

Overall, this subject is quite well-taught and covers some very interesting topics. I would highly recommend spending time on this subject as it is more challenging than it first appears. Putting in the effort to gain a deep understanding of the concepts throughout the semester is the best way to be prepared for the exam and to be successful in this subject.

Rating: 4 out of 5

ACTL30003 Contingencies

Exemption subject and CT: Yes, CT5

Lecturer(s): Ping Chen

Number of lectures and tutorials: 2 x 2 hour lectures (6 hours of lectures in first week), 2 x 1 hour tutorials.

Assessment: Group project in last 2 weeks (20%), exam (80%)

Textbook recommendation: University textbook/lecture notes

Lecture capture: No

Year and semester of completion: 2014, Semester 2

Description of subject content: This is a life insurance subject. Essentially combines EPV and survival probabilities. Most calculations relate to calculating premiums and reserves.

Comments: *Positives-* 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.

Negatives- 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. Making sure every aspect of the question is addressed is important.

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 Financial Maths I & II and 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.

Rating: 4 out of 5

ACTL30004 Actuarial Statistics

Exemption subject and CT: CT6 Statistical Methods (along with ACTL40002 Risk Theory)

Lecturer(s): Enrique Calderin

Number of lectures and tutorials: 2 x 1 hour lectures and a 1 hour tutorial per week. An additional 1 hour optional class test is held approximately four times during the semester

Assessment: Two group assignments (10% each) and one final exam (80%).

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: Lectures were not recorded in Semester 2, 2014.

Year and semester of completion: Semester 2, 2014

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 Excel is required for tutorial work and assignments.

Comments:

This subject built upon knowledge from Actuarial Modelling II and 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.

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.

Rating: 4 out of 5

ACTL30005 Models for Insurance and Finance

Exemption subject and CT: Non-exemption subject but prepares students for ACTL40004 Advanced Financial Mathematics I and to a lesser extent ACTL40002 Risk Theory I (CT 6 and CT 8 subjects)

Lecturer(s): Daniel Dufresne

Number of lectures and tutorials: Three 1 hour lectures per week, with the final lecture run like a tutorial where exercises are solved with the entire class.

Assessment: Two group assignments (10% each) and one final exam (80%).

Textbook Recommendation: There is no prescribed text for this subject. Lecture notes and exercises are provided weekly.

Lecture Capture: Lectures were not recorded Semester 2, 2014.

Year and semester of completion: Semester 2, 2014

Description of 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, expectations
- Conditional expectations
- Convergence in distribution, in probability
- Random walks, mean reversion
- Brownian motion
- Stochastic calculus
- Martingales

Comments:

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 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 practice. There are not a lot of tutorial problems and some weeks, there are no tutorial problems at all because the lecture/tute 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.

Rating: 3.5 out of 5