



A Guide to Studying Actuarial Science

Version 3.0 — Semester 1 2020

Prepared by the *Student Actuarial Society at Curtin University*

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Foreword

The [Student Actuarial Society](#) would like to present our guide to studying Actuarial Science at Curtin University.

The primary purpose of this document is to provide information regarding units commonly taken by Actuarial students at Curtin. If you are not a *current* or *future* actuarial student at Curtin University, the majority of the information in this document may not be relevant to you. This document is *by* students, *for* students and it is through this approach, we hope to provide a valuable insight that is difficult to obtain elsewhere.

The heart and soul of this document is the [unit guides](#) which provide information on units taken by actuarial science students at Curtin. They will answer your burning questions including “how difficult is the unit?”, “should I buy the textbook?”, “what is the teaching style?” and more. You may wish to navigate *directly* to units that interest you via the table of contents above or the bookmarks of this document if your pdf viewer supports it. This document contains a large number of links to internal content (including particular unit guides when they are mentioned). A handy keyboard shortcut on some pdf readers is ALT+LEFT ARROW which allows you to return to the previous location in the document after clicking a link to an internal location in the document. The unit guides are ordered such that the core units for each of [first year](#), [second year](#), [third year](#) and [honours](#) appear first, followed by [optional units](#) ([1000 units](#), [2000 units](#), [3000 units](#) and [4000 units](#)).

In addition, we have sections on [useful links for students](#), [actuarial science education structure](#) (including [actuarial accreditation](#) and [actuarial course structure at Curtin](#)) and [careers](#). We seek to continually expand and improve this document and may add more sections to this guide in future. We have also recently added a section on [careers](#) after the unit guides along with performing a major overhaul of the formatting of the document.

A significant amount of effort and research has gone into the creation of this guide so we hope you find it helpful. We are always looking to improve the guide so if you would like to contribute to the guide in any way, please contact us as directed on the webpage linked at the bottom of each page of this document. Ways in which your input may be helpful include:

- » Assistance with unit guides (see the [appendix](#) for a list of units that require this):
 - ↳ Updating information in unit guides that are incomplete.
 - ↳ Providing information on a unit that is yet to be reviewed (a list of such units can be found in the appendix).
- » Suggestions for additional information that might be added.
- » Correction of spelling and grammatical errors.
- » General feedback on how the guide can be improved.

The SAS guide is a constant work in progress owing to the nature of ever-changing information. Expect us to release an updated version each year, if not each semester.

Thank you for taking the time to read our guide, we hope you find it helpful.

Useful Information for Students

There are a number of great sources of information out there that many students may not be aware of. We hope that this document satisfies many of your needs, but we are trying as much as possible to avoid providing information that is readily available elsewhere. In some cases, information elsewhere is in an unpalatable format or incomplete and that is how we draw the line on what should be included in this document. With all this in mind, below we have collated a list of sources of information relating to units at Curtin and actuarial science in general.

Published Unit Outlines

Download past unit outlines (requires Curtin student login):

https://ctl.curtin.edu.au/teaching_learning_services/unit_outline_builder/search_published_UO.cfm

Curtin provides a database of past unit outlines; all you need to do is enter your Curtin ID and password. This could be useful for finding information about what to expect in a unit you will take in the future. Of course, in this document we also help with this in our [unit guides](#).

You can also check if the lecturer of a unit you currently take has changed, which will help with determining the relevance of information in the SAS guide.

The website can be slow to complete your search, be patient. Tips for improving your search results:

Narrow your search by:

- » Searching for a specific unit code.
- » Searching for a specific study period or year.
- » Searching for a specific "area".
 - ↳ When searching for a specific area keep in mind that due to a recent reshuffling of departments, most actuarial units that fell under the Department of Mathematics and Statistics in semester 1 of 2018 and prior now fall under the School of Elec Eng, Comp and Math Sci (EECMS) in semester 2 2018 and beyond.

Past Evaluate Reports

https://evaluate.curtin.edu.au/student/unit_search.cfm

You are probably familiar with the Evaluate surveys you are asked to fill out every semester. What you may not know is that you can search for past evaluate reports for units you might take in the future in order to gauge what the unit might be like. Again, in this document we also provide similar information in our [unit guides](#).

Much like the corresponding website for unit outlines, the website can be slow to complete your search, so be patient. Tips for improving your search results:

- » Narrow your search by:
 - ↳ Searching for a specific unit code.
 - ↳ Searching for a specific study period or year.
 - ↳ Searching for a specific "area".
- » When searching for a specific area keep in mind that due to a recent reshuffling of departments, most actuarial units that previously fell under the Department of Mathematics and statistics in semester 1 of 2018 and prior now fall under the School of Elec Eng, Comp and Math Sci (EECMS) in semester 2 2018 and beyond.

Library Catalogue Search

<https://catalogue.curtin.edu.au> (can also be accessed via Oasis My Library)

On the library catalogue you can search for textbooks and past exams. Some textbooks are provided as a downloadable online resource for free or failing that, many can be borrowed from the library. This can be useful if you want to have a look at the textbook but do not think it is worth actually purchasing. Unfortunately, the library does not stock CT notes.

Past exams can be searched for on the library catalogue. Simply search for the unit name (for example Statistical Probability) and filter it by past exams. The number of past exams that are posted vary but you can expect at least one and most likely several past exams to be posted for almost every unit. Also keep in mind unit name changes as some past exams may be posted under their previous unit name (the [unit guides](#) below indicate any recent name changes to units).

Respected research material can also be found on this website too. While the broader internet is a great source, using the library catalogue and databases can be a way of ensuring quality sources of information. Journals often require you to purchase them in order to access articles. Should you find an article online that is pertinent to your research but is also behind a paywall, you will often be able to bypass this by searching through the library catalogue. As an example, the *North American Actuarial Journal* is made available through one of the library's databases. The library's abundance of resources for research are particularly useful for [research projects](#).

Curtin Course Handbooks

First two years: <http://handbook.curtin.edu.au/courses/31/319306.html>

Third Year Actuarial Science stream: <http://handbook.curtin.edu.au/courses/31/319191.html>

Third Year Actuarial and Applied Statistics stream:

<http://handbook.curtin.edu.au/courses/31/319192.html>

Honours: <http://handbook.curtin.edu.au/courses/31/319305.html>

Masters: <http://handbook.curtin.edu.au/courses/31/319304.html>

The Actuarial Science Handbook provides details of the course structure of the degree. Please note however, that alternative study plans exist upon negotiation with the Program Coordinator (currently Jo-Anne Morgan). Many units only run in one semester and as a result, students who commence their actuarial degree in semester 2 will inevitably depart from the study plan indicated in the course handbook.

Plan Your Timetable

<http://timetable.student.curtin.edu.au/criteriaEntry.jsf>

Plan your timetable can also be accessed via OASIS My Studies. If accessed via OASIS, it will automatically fill in the units you are enrolled in for the current semester.

Curtin's Plan Your Timetable database is a way of unofficially planning your timetable outside of the "My Classes" tab in eStudent. Plan Your Timetable tends to show the next semester's timetable several weeks before you can actually enrol in classes. It is capable of showing units you are not currently enrolled in making comparison of timetables based on different choices of options units possible. You can also see the exact number of places and students currently enrolled in each class.

Note that you will still need to officially register for classes via My Classes. Plan Your Timetable simply provides additional information which you can use to make decisions.

Actuarial Organisations

Actuaries Institute Website (Australia): <https://www.actuaries.asn.au/>

The Actuaries Institute is Australia's professional body for the actuarial profession. The Actuaries Institute website provides up-to-date news and information regarding actuarial accreditation in Australia.

The Actuaries Institute has an agreement with a number of other actuarial organisations across the world to recognise the accreditation of other actuaries from certain countries. As a part of this arrangement, a number of countries, including Australia, adhere to the curriculum prescribed by the UK equivalent, Institute and Faculty of Actuaries.

Institute and Faculty of Actuaries (UK): <https://www.actuaries.org.uk/>

One may obtain past institute [exam papers](#) from this website as well as further information about the curriculum. Third year students should find this a useful resource as the Curtin exams they take will mirror those held by the Institute.

See [below](#), our Curtin unit to Institute subject mappings reference table.

Online Media

Student Actuarial Society

Website: <https://www.curtinactuary.com/>

Facebook group (click Join Group): <https://www.facebook.com/groups/sascurtin/>

Facebook page (click like or follow): <https://www.facebook.com/SASCurtin/>

As someone who has access to this document, we would assume you know about us in some way but following us on all our channels can be very useful.

We use our website to provide general information about Actuarial Science at Curtin, post work experience opportunities and host registration forms for events. Our Facebook group is a place for our members to communicate with each other, share information about job opportunities and promote events. On the Facebook page, we answer direct questions from our members, post photos and host events.

Actuarial YouTube Channels

In this modern age of technology students have the opportunity to employ a wide range of resources to foster their learning. One of these resources is of course YouTube but the quality of content there varies significantly. Described below are some YouTube channels that may be of interest to you as an actuarial science student.

MJ the Fellow Actuary (formally known as *MJ the Student Actuary*):

<https://www.youtube.com/channel/UCOds8nIJ6Ony9ZIH0Y7u2Cg>

Michael Jordan is an actuary from South Africa who makes videos about actuarial science and the actuarial profession, doing so as he has progressed through his own actuarial education pathway. He recently (as of 2019) completed his fellowship and it was on this esteemed occasion that he [changed the name of his channel](#). As is the case in Australia, South Africa adhere to the actuarial curriculum prescribed by the Institute and Faculty of Actuaries in the UK, so his playlists on various CT subjects may be of particular use to students at Curtin.

Fun fact: MJ attended Wits University where he was lectured by none other than current actuarial lecturer at Curtin, Mark Hayes.

EllelleActuary: https://www.youtube.com/channel/UCvN_MUDrIFJOQAVT1UhkPEw/videos

Michelle is an Actuary from Canada. Her content focuses on her journey to becoming an actuarial fellow (which she achieved in 2017). Her videos would be of interest to anyone who is seeking someone's personal experience about what being an actuary is like. She started out by uploading some actuary-related content to her [vlogging channel](#) but has since established a dedicated actuarial channel.

r/actuary Subreddit

<https://www.reddit.com/r/actuary/>

This subreddit is mainly focussed on the American system but can provide some handy information (and also some other more amusing content) that Australian students can still benefit from.

Online articles

Towards Data Science (Medium): <https://towardsdatascience.com/>

Towards data science provides a number of interesting articles written by data science practitioners. Following this website can help students stay in the loop with all the latest developments in the ever-evolving world of data science.

Careers websites

Glassdoor: <https://www.glassdoor.com.au/Reviews/index.htm>

Seek: <https://www.seek.com.au/>

GradConnection: <https://au.gradconnection.com/>

All of the sources above are very useful when looking for internships/vacation work and graduate positions. Glassdoor is particularly focussed on sharing salary information about particular companies. Seek and GradConnection provide job listings. GradConnection is specifically focussed on vac work and grad roles for university students.

Other sources of job information include:

- » The [Student Actuarial Society website and social media](#) are also places where we share opportunities that are specifically relevant to actuarial science students at Curtin.
- » Towards the end of this document, we have a specific section on [careers](#) that can give you a feel for the industries and skills that are important for actuarial students.
- » Curtin UniHub (available at <https://careerhub.curtin.edu.au/>) lists job opportunities much like Seek and GradConnection, some of which are not heavily advertised elsewhere.
- » Lecturers often share opportunities on the Curtin Mathematics and Statistics Blackboard organisation that all Actuarial students are automatically a part of.
- » LinkedIn is another place where jobs are often posted.

Useful Smartphone Applications for Students

Outlook app: <https://products.office.com/en-us/outlook-mobile-for-android-and-ios>

This is probably the best way to check your university email. Not only do you get notifications, but it also has the benefit that you can click on it once and it will mark as read rather than having to click it several times, which is what happens when you access them through OASIS.

Lost on campus: <https://studentvip.com.au/lost-on-campus>

Probably the easiest way to find your way around the Curtin campus (and the campuses of many other Australian universities as well). Note that you need to create a free Student VIP account to login.

Elsie: <https://campaign.curtin.edu.au/elsie-app/>

This is a great organisational app that automatically populates your university timetable and units. The map on Elsie has recently been improved and some may prefer it to Lost On Campus, it is worth checking out. The app also allows you to obtain information about your results and graduation status earlier than usual which we outline below.

The “progress” section can also be used to view your updates course weighted average a few days earlier than the official release date and hence reverse engineer your semester weighted average (but not individual marks for units).

If you anticipate that you will graduate in the current semester, you can tell that you have successfully graduated if you can no longer login to the Elsie app. This will usually happen approximately a week out from the official results release date. You can also double check this by seeing if the '@student.curtin.edu.au' in your email is replaced by '@graduate.curtin.edu.au' where you search your own name in the outlook 'To' box when you start a 'new message'.

Blackboard: <https://www.blackboard.com/mobile-learning/blackboard-app.html>

A convenient way to access blackboard via your phone. A nice feature is the ability to save content for availability offline.

Echo360: [Apple](#), [Android](#)

View iLectures on your phone (download for offline viewing is available). Note that you need to use student number version of email to login.

Actuarial Science Education Structure

2019/2020 Curriculum Changes

As a preface to the rest of this section we will first go over the changes both at the Actuaries Institute and at Curtin that are occurring between 2019 and 2020 and being rolled out over the years that follow.

Actuaries Institute Changes

The Actuaries Institute will be making changes to the curriculum in 2019. This will render the above information out of date. The main idea is to update the curriculum to suit modern times by integrating more technology into assessment. There are transition protocols in place for those who are halfway through their accreditation when the changes are made. Under the new curriculum, the current Part I Program will be replaced with the new Foundations Program. There is a system for mapping in place whereby some CT subjects will be merged together into one.

Curtin have an agreement with the Actuaries Institute to make these changes later, starting in 2020. That is to say, those commencing their Actuarial Science degree in semester 1 2020 or after will be subject to the new curriculum. Students who commenced their degree prior to this will study the old curriculum but their exemptions will actually be to the corresponding new foundations subjects. As the old curriculum will no longer be used by the Actuaries Institute as of 2019 you must sit the new Foundations exam should you fail to obtain any of your exemptions and still wish to become an accredited actuary. A similar arrangement exists for Part II such that if you commence your Honours in semester 1 2020 or after you will also be subject to the new curriculum.

Visit the Actuaries Institute website at <https://www.actuaries.asn.au/> for more information.

Resultant changes from Curtin

As the new curriculum has shuffled around topics, prescribed more computer technology and added a small amount of new content, Curtin will change the units for actuarial exemption for those that commence their degree in 2020 and after.

Some key changes are:

- » A number of the topics from the old CT6 are not going into its new curriculum equivalent, CS2.
 - ↳ Loss distributions, credibility theory and Bayesian methods will be covered in the new CS1 exemption unit, [STAT3009](#) Risk Analysis.
 - ↳ Ruin theory and run-off triangles will be covered in the new CM2 exemption unit [STAT3008](#): Provisioning techniques.
 - ↳ Generalised linear models have moved to CS1.
- » Copulas is new topics that is included in the CS1 curriculum and appears to be taught at Curtin through the unit [STAT3009](#) Risk Analysis.
- » Machine learning is a new topic that has been introduced to the CS2 curriculum.
 - ↳ It appears that the Curtin units are lighter on the machine learning than the prescribed curriculum for CS2 would suggest (this still has a chance to change in the coming year).
 - !! This is not ideal for students given it is a skill that many will be interest in. They are well within their rights to do this given you only need 85% of the content to be an eligible exemption unit but it would be a bit lazy and a huge misjudgement to remove this particular topic given the likely level of interest from students.
 - !! It may well be the case that the unit [STAT3001](#) Statistical Modelling will be changed to incorporate machine learning.
- » Excel and R will be used in units where they previously weren't.
 - ↳ The usage of Excel in contingencies may make the unit easier and less frustrating for students. The main difficulty with the old life contingencies units were the insane amount of manual computation required.

Overall the curriculum changes made mean difficult units occur earlier in the degree and more units are required to satisfy exemption than the previous arrangement. As a result, we anticipate the curriculum

changes will make it more difficult to obtain exemptions at Curtin (as if it wasn't already hard enough) unless they adjust the grade requirements from where they currently stand at 73%.

Coincidental 2020 changes for Curtin as a whole

At a strikingly similar time to the actuary-specific changes (but entirely by coincidence), Curtin as whole undertook some changes that effect the whole university.

The primary of these changes is the removal of half units. Gone are the days of first year students having five exams at once. This means that all half units that were previously studied by actuarial students have been replaced and as a result, the degree has been entirely restructured. Some of the lines are blurred between which changes to the structure are caused by the actuarial curriculum changes but both in combination make for a very different degree.

The previous (and infamous) Science Communications unit (which was also a half unit) has been replaced with [NPSC1003](#) Integrating Indigenous Science and STEM in all science degrees at Curtin. This is not a direct replacement of the old unit.

Summary of changes to the Curtin degree

Below is a table presenting all the changes that will occur to the Curtin actuarial science degree as a result of everything mentioned above. All of these changes apply only to those who commenced their degree in 2020 and after. They may however, only come into effect as late as 2022 (when they reach third year).

Year changes apply	Previous unit(s)	Replacement unit(s)	Notes
2020	COMS1000 Science Communications	NPSC1003 Integrating Indigenous Science and STEM	Previous generalist communications half unit replaced by an Aboriginal Studies full unit
	STAT1001 Statistical Data Analysis STAT1002 Statistical Probability	STAT1005 Introduction to Probability and Data Analysis	The previous two first year statistics half units replaced by a single statistics full unit. It appears to be a combination of the two old units.
	ACCT1000 Accounting - The Language of Business	ACCT1002 Financial Decision Making	The previous accounting unit has been changed to a new financial unit. This is presumably to adjust for differences between the old CT2 subject and the new CB1 curricula (note that ACCT1000 still exists, it just no longer appears on the actuarial science study plan).
	ACTL1001 Principles of Insurance and Superannuation ACTL1000 Principles of Actuarial Science	ACTL1002 Introduction to Actuarial Science ACTL1003 Introductory Actuarial Practices	The previous two introductory actuarial units have been replaced by two new ones. This appears to be a reshuffle where ACTL1003 gets the Excel component of ACTL1000 and everything else is in ACTL1002 .
	STAT1000 Regression and Nonparametric Inference	STAT1006 Regression and Nonparametric Inference	The old half unit has been replaced by a full unit. Few differences are expected (perhaps some differences in assessments due to the increased credit points).
	STAT4000 Actuarial Science Honours Dissertation 1	STAT4004 Actuarial Science Honours Dissertation 1	The previous 25 credit point research project unit has been replaced with a 50 credit point research project unit. The unit itself is likely to stay essentially the same but this should afford students some much needed additional time to work on their projects throughout their busy honours year.
	3 optional units (two in each semester 1 and one in semester 2)	No optional units ACTL4003 Predictive Analytics Principles ACTL4004 Actuarial Risk Management	To make room for new curriculum subjects, as well as the increased credit points on the research project, all optional units have been dropped from the honours degree. While this presents a loss in flexibility, it will allow students to focus more on the units that will help them become an actuary.
2021	ECON1000 Introductory Economics ECON2001 Macroeconomics Principles	ECON1001 Actuarial Economics	For students who commence their degree in 2020, ECON1001 appears to be the only possible choice of economics unit. Students no longer have the "easier" option of choosing to take the equivalent path of ECON1000 followed by ECON2001 . Perhaps students can still negotiate this if they think ahead with their optional unit in the first semester of second year. This should be discussed with the actuarial science course coordinator.

Year changes apply	Previous unit(s)	Replacement unit(s)	Notes
	<p>Taken in third year: STAT3001 Statistical Modelling</p> <p>STAT3006 Investment Science 1</p>	<p>Taken in second year: STAT3001 Statistical Modelling</p> <p>STAT3006 Investment Science 1</p>	<p>There has been a reshuffle of some units to accommodate the new curriculum so two rather challenging units that were previously in third year first semester according to the study plan have been moved to second year second semester.</p>
	2 optional units (one in each semester)	1 optional unit (only in semester 1)	<p>Due to the extra units, less flexibility will be available to students in second year. This combined with the fact that there are 125 (out of a maximum of 150) compulsory 1000-level units means that optional unit combinations that were possible under the old system have now been rendered impossible. This is unfortunate for students who really want to get something out of their optional units.</p>
	Compulsory unit: MATH2001 Calculus 2	Optional unit: MATH2001 Calculus 2	<p>Calculus 2 is no longer compulsory, presumably because was not seen as necessary knowledge to complete later units. This is probably fair although it does introduce Lagrange Multipliers which are used in STAT3006 Investment Science 1.</p>
2022	MATH3005 Survival Analysis	MATH3008 Survival Models & Analysis	<p>Reflects changes between the old CT4 and the new CS2 curricula. The syllabi for both units appear strikingly similar.</p>
	STAT3007 Investment Science 2	STAT3010 Financial Engineering 2	<p>Reflects changes between the CT8 and CM2 curricula (in particular the greater emphasis of Excel). The syllabi for both units appear strikingly similar.</p>
	STAT3002 Risk Analysis and Credibility Theory	<p>STAT3008 Provisioning Techniques</p> <p>STAT3009 Risk Analysis</p>	<p>One unit has been split into two to reflect the fact that the topics from STAT3002 in the previous CT6 have been split between CS1 and CM2. Some additional topics appear to have been added to each as well.</p>
	<p>MATH3006 Life Contingencies 1</p> <p>MATH3007 Life Contingencies 2</p>	<p>MATH3008 Contingencies 1</p> <p>MATH3009 Contingencies 2</p>	<p>Reflects changes between the CT5 and CM1 curricula (in particular the greater emphasis of Excel). The syllabi for corresponding units appear strikingly similar.</p>
	<p>Optional unit for Actuarial & Applied Statistics stream: STAT2003 Analytics for Experimental & Simulated Data</p> <p>Compulsory unit for Actuarial & Applied Statistics stream: STAT3003 Applied Statistics</p> <p>STAT2004 Analytics for Observational Data</p>	<p>Compulsory units for Actuarial & Applied Statistics stream: STAT2003 Analytics for Experimental & Simulated Data</p> <p>STAT2004 Analytics for Observational Data</p>	<p>STAT2003 is now a compulsory unit to satisfy the prerequisites for STAT2004. Previously students were exempt from the prerequisites for STAT2004 due to the fact it had replaced STAT3003 which was no longer offered. They now have the chance to remedy this and provide the prerequisite, so they have. In reality this change might occur sooner than 2022 but it is yet to be reflected in the course handbook at the beginning of 2020.</p>

Year changes apply	Previous unit(s)	Replacement unit(s)	Notes
	Potential elective unit for Actuarial & Applied Statistics stream: MATH3005 Survival Analysis	Compulsory unit for Actuarial & Applied Statistics stream: MATH3008 Survival Analysis & Models	Under the previous system, Actuarial & Applied Statistics majors did not have to do Survival Analysis (but could use their elective to choose it if they wanted). Now it is compulsory for them to the new curriculum equivalent of the old MATH3005 , MATH3008 . This seems like an unusual change to the major given the unit focusses on mortality rates, the study of which applied statistics students have previously managed to avoid entirely in favour of more general statistical topics.

Other minor changes to lists of options available themselves have also occurred. See the [study plans](#) below for more information.

Many of the “notes” in the table above reference changes to the curricula prescribed by the Actuaries Institute. See the section on this topic [below](#) for more information on these changes.

Accreditation from the Actuaries Institute

As an actuarial student, you would have no doubt heard of CT units. However, you may or may not be familiar with all the finer details surrounding them. Here we have collated some information about actuarial accreditation that is pertinent to those actuaries in the making who are studying at Curtin University specifically.

The Current System

Parts

In the current (soon to be changed) system there are three educational parts (I, II and III) to becoming an actuary (for more information, visit the [Actuaries institute website](#)).

A Bachelor of Science in Actuarial Science at Curtin allows students to satisfy Part I requirements from the Actuaries Institute. Completing Honours in Actuarial Science at Curtin also affords students the opportunity to satisfy Part II requirements. Honours in Actuarial Science is available to high performing students in the Actuarial Science third year stream after completion of the initial three-year bachelor’s degree. Part III must be completed externally via the Actuaries Institute. Most students who choose this path, do so alongside full-time work.

Part I comprises of the eight Core Technical (CT) subjects, each of which has corresponding Curtin units (see table [below](#)). By obtaining sufficient grades (an average of 73%) in the corresponding Curtin unit(s), one may gain exemption from sitting the corresponding CT exams which are hosted by the Actuaries Institute.

CT notes

Each CT subject has corresponding study materials, prepared by [ActEd](#). Official CT notes are available for purchase via the ActEd website.

We do not recommend that you purchase notes for CT2 or CT3 as their corresponding Curtin units are self-contained and taken by many non-actuarial students. The textbook or unit materials provided will prove more appropriate.

The CT7 notes can be useful should you choose to take Actuarial Economics, but they are definitely not essential.

CTs 1,4,5,6 and 8 are all exempted by subjects taken predominantly by actuarial students and it is thus more useful and, in some cases, essential (see [unit guides](#) below for further advice on specific units) to purchase the ActEd notes for these units. You will usually be encouraged to do so when you take these units but keep in mind that the notes will be more useful for some units than others.

Curtin Unit to Actuaries Institute Subject Mapping

The previous Part I Program and the new Foundation Program

This information can also be found on the [Student Actuarial Society website](#).

Please note that CT exemptions are not required to graduate from Curtin.

To gain exemption from an actuarial Part I exam, Curtin students must obtain an average of at least 73% and a minimum of 65% across all units that correspond to that subject. For students who commence their degree in 2020 and after, this cut-off is not yet known but it may well remain the same.

Below is an equivalency table in terms of old curriculum versus new curriculum as well as Curtin versus Actuaries Institute.

New Foundation Program Core Principle Subjects	Curtin Actuarial Science Exemption Units (2020 and after)	Old Part I Program Core Technical Subjects	Curtin Actuarial Science Exemption Units (2019 and prior)
CB1 Business Finance	ACCT1002 Financial Decision Making FNCE2000 Introduction to Finance Principles	CT2 Finance and Financial Reporting	ACCT1000 Accounting – The Language of Business FNCE2000 Introduction to Finance Principles
CB2 Business Economics	ECON1001 Actuarial Economics	CT7 Business Economics	Either ECON1001 Actuarial Economics Or, both of ECON1000 Introductory Economics ECON2001 Macroeconomics Principles
CM1 Actuarial Mathematics 1	MATH2004 Theory of Interest MATH3009 Contingencies 1 MATH3010 Contingencies 2	CT1 Financial Mathematics CT5 Contingencies	MATH2004 Theory of Interest MATH3006 Life Contingencies 1 MATH3007 Life Contingencies 2
CM2 Financial Engineering and Loss Reserving	STAT3006 Investment Science 1 STAT3007 Provisioning techniques STAT3010 Financial Engineering 2	CT8 Financial Economics	STAT3006 Investment Science 1 STAT3007 Investment Science 2
CS1 Actuarial Statistics 1	STAT1005 Introduction to Probability and Data Analysis STAT1006 Regression and Nonparametric Inference STAT2001 Mathematical Statistics STAT3009 Risk Analysis	CT3 Probability and Mathematical Statistics	STAT1002 Statistical Data Analysis STAT1001 Statistical Probability STAT1000 Regression and Non-Parametric Inference STAT2001 Mathematical Statistics
CS2 Risk Modelling and Survival Analysis	STAT3005 Stochastic Processes STAT3001 Statistical Modelling MATH3008 Survival Models & Analysis	CT4 Models CT6 Statistical Models	STAT3005 Stochastic Processes MATH3005 Survival Analysis STAT3001 Statistical Modelling STAT3002 Risk Analysis and Credibility Theory

The previous Part II Program and the new Actuary Program

A new pathway to becoming an Associate of the Actuaries Institute will be in place in 2020 and beyond called the new 'Actuary Program'. Visit <https://www.actuaries.asn.au/education-program/fellowship/transition-arrangements> for details on the transition arrangements that are in place.

To gain exemption from an actuarial Part II subject in 2019 and prior one must obtain an average of 70% across the exemption units indicated below. The cut-off in 2020 and after is not yet known but it may well be the same.

See the table below for correspondence between the Actuaries Institute and Curtin under the new and old system.

New Actuary Program Subjects	Curtin Actuarial Science Exemption Units (2020 and after)	Old Part II Program Subjects	Curtin Actuarial Science Exemption Units (2019 and prior)
Actuarial Control Cycle	ACTL4000 Actuarial Control Cycle 1 ACTL4001 Actuarial Control Cycle 2	Actuarial Control Cycle 1 & 2	ACTL4000 Actuarial Control Cycle 1 ACTL4001 Actuarial Control Cycle 2
Asset and Liability Management (ALM)	Delivered by the Actuaries Institute ACTL4002 Actuarial Asset Liability Management assists with preparation for this unit but does not provide exemption	Investment & Asset Modelling	ACTL4002 Actuarial Asset Liability Management
Data Analytics Principles	ACTL4003 Predictive Analytics Principles	No equivalent in the previous system	N/A
Communication, Modelling and Professionalism (CMP)	Delivered by the Actuaries Institute	Professionalism Course	Delivered by the Actuaries Institute

The Actuarial Science Courses at Curtin

Study plans

Here we provide a description how each of the actuarial science courses at Curtin are structured and which units are taken in which semester.

Undergraduate: Bachelor of Science (Actuarial Science)

The Bachelor of Science in Actuarial Science at Curtin university is a three-year degree. In the third year of the degree students may choose between two streams (see the section [below](#) for more information on making this decision):

- » Actuarial Science stream
 - ↳ study all full actuarial Foundation program exemption units.
- » Actuarial and applied statistics stream
 - ↳ only allows for partial completion of exemption units but is a broader, more flexible degree.

High performing students who completed the Actuarial Science third year stream are eligible to apply to an additional Honours year after completion for their first three years of study. This will give them a Bachelor of Science in Actuarial Science *with Honours* and allows for satisfaction of exemption requirements from Actuary program (previously part II) university-delivered subjects.

In the past, nominal admission criteria have been a course weighted average (CWA) of above 75% and satisfaction of exemption requirements for at least 6 of the 8 CT subjects (probably 4 or 5 of the 6 foundation subjects in the new system). This is of course subject to change and may be negotiated with the actuarial science course coordinator.

Commenced degree in 2019 and prior**First and second year 2019/2020 and prior**

Note that those who **commenced their degree in 2020 and after** should consult the study plan [below](#).

Year 1 ¹		Year 2 ²	
Semester 1	Semester 2	Semester 1	Semester 2
ACCT1000 Accounting - The Language of Business	ECON1000 Intro Economics or ECON1001 Actuarial Economics	FNCE2000 Intro to Finance Principles	MATH2005 Practical Mathematical Financial Modelling
MATH1015 Linear Algebra 1 or MATH1017 Advanced Mathematics 1	MATH1016 Calculus 1 or MATH1018 Advanced Mathematics 2	MATH2009 Calculus 2	MATH2004 Theory of Interest
ACTL1001 Principles of Insurance & Superannuation	ACTL1000 Principles of Actuarial Science	STAT2001 Mathematical Statistics	STAT3005 Stochastic Processes
STAT1001 Statistical Probability ³	COMS1000 Science Communications ³	Optional (choose 1) COMP1005 Fundamentals of Programming	Optional (choose 1) ECON2001 Macroeconomic Principles ⁴
STAT1002 Statistical Data Analysis ³	STAT1000 Regression & non-Parametric Inference ³	STAT1003 Intro to Data Science MATH2015 Mathematical Computing INDE2000 Supply Chain Models & Optimisation MATH2011 Operations Research	MATH2010 Linear Algebra 2 STAT2003 Analytics for Experimental & Simulated Data COMP1005 Fundamentals of Programming INDE2001 Logistics Models & Optimisation MATH2000 Network Optimisation MATH3001 Applied Mathematical Modelling

Source: <http://student.handbook.curtin.edu.au/courses/31/319306.html>

¹ Note that this is an old study plan which has been kept for legacy purposes. Any first years from 2020 onward should refer to the new study plan [below](#).

² Note that this study plan only applies to second years in 2020. From 2021 onwards, second years should refer to the new study plan [below](#).

³ This is a half unit (worth 12.5 units). Curtin are phasing these out entirely in 2020. Some may still be offered in semester 1 of 2020 so that those who started mid-year in 2019 can continue their original study plan.

⁴ This unit must be taken if [ECON1000](#) Introductory Economics was chosen in first year and cannot be taken if [ECON1001](#) was chosen.

Third year streams 2021 and prior⁵

Note that those who commenced their degree in 2020 and after should consult the study plan [below](#).

Year 3 (Actuarial & Applied Stats)		Year 3 (Actuarial Science)	
Semester 1	Semester 2	Semester 1	Semester 2
STAT3000 Statistical Inference	MATH3004 Industrial Project	STAT3006 Investment Science 1	STAT3007 Investment Science 2
STAT3001 Statistical Modelling	STAT3003 Applied Statistics STAT2004 Analytics for Observational Data ⁶	STAT3001 Statistical Modelling	STAT3002 Risk Analysis and Credibility Theory
Elective ⁷ (choose 2)	Optional (choose 1) INDE2001 Logistics Models & Optimisation INVE3000 Intro to Derivative Securities INVE3001 Portfolio Management MATH2000 Network Optimisation STAT2003 Analytics for Experimental & Simulated Data Elective (choose 1)	MATH3006 Life Contingencies 1 MATH3005 Survival Analysis	MATH3007 Life Contingencies 2 Optional (choose 1) STAT2003 Analytics for Experimental & Simulated Data INDE2001 Logistics Models & Optimisation INVE3000 Intro to Derivative Securities MATH3001 Applied Mathematical Modelling MATH2000 Network Optimisation STAT3003 Applied Statistics ⁸

OR

Source: <http://student.handbook.curtin.edu.au/courses/31/319192.html>
<http://student.handbook.curtin.edu.au/courses/31/319191.html>

⁵ Note that these third-year stream study plans will continue until 2021 (when those that commenced their degree in 2019 reach third year).

⁶ Note that while the unit STAT3003 Applied Statistics appears in this place in the official handbook, it has actually been replaced by [STAT2004](#) Analytics for Observational Data. This is due to the fact that STAT3003 is no longer offered. In the past, prerequisites for [STAT2004](#) have been waved where students do not satisfy them. However, in future, students may be required to take the prerequisite unit STAT2003 Analytics for Experimental and Simulated Data concurrently as an optional unit if they have not done it already (discuss with the actuarial science course coordinator).

⁷ An elective unit can be any unit you are eligible for that is offered by Curtin. Note however the Curtin policy that undergraduate students are limited to 250 points worth of first year (1000 level) units in their degree.

⁸ Note that the unit STAT3003 Applied Statistics is no longer available.

Honours (fourth year) 2019 and prior⁹

Note that those who commenced their degree in 2020 and after should consult the study plan [below](#).

Year 1/ Year 4	
Semester 1	Semester 2
ACTL4000 Actuarial Control Cycle 1	ACTL4001 Actuarial Control Cycle 2
STAT4000 Actuarial Science Honours Dissertation 1	STAT4001 Actuarial Science Honours Dissertation 2
Optional (choose 2)	ACTL4002 Actuarial Asset Liability Management
MATH3000 Mathematical Methods	Optional (choose 1)
INVE3000 Intro to Derivative Securities	STAT3003 Applied Statistics⁸
INDE2000 Supply Chain Models & Optimisation	INDE2001 Logistics Models and Optimisation
INDE3000 Industrial Modelling and Optimisation	MATH3001 Applied Mathematical Modelling
MATH2011 Operations Research	MATH2000 Network Optimisation
	INVE3000 Intro to Derivative Securities
	STAT2003 Experimental and Simulated Data

Source: <http://student.handbook.curtin.edu.au/courses/31/319305.html>

⁹ Note that this study plan will apply to very few current students. It is provided here for legacy purposes.

Commenced degree in 2020 and after**First and second year 2020/2021 onward¹⁰**

Note that those who commenced their degree in 2019 and prior should consult the study plan [above](#).

Year 1		Year 2	
Semester 1	Semester 2	Semester 1	Semester 2
NPSC1003 Integrating Indigenous Science	ACCT1002 Financial Decision Making	FNCE2000 Intro to Finance Principles	STAT3005 Stochastic Processes
MATH1015 Linear Algebra 1 or MATH1017 Advanced Mathematics 1	MATH1016 Calculus 1 or MATH1018 Advanced Mathematics 2	MATH2004 Theory of Interest	STAT3001 Statistical Modelling
ACTL1002 Intro to Actuarial Science	ACTL1003 Introductory Actuarial Practices	STAT2001 Mathematical Statistics	STAT3006 Investment Science 1
STAT1005 Intro to Probability & Data	STAT1006 Regression & Nonparametric Inference	Optional (choose 1) COMP1005 Fundamentals of Programming MATH2009 Calculus 2 MATH2015 Mathematical Computing INDE2000 Supply Chain Modelling & Optimisation MATH2011 Operations Research INVE3001 Portfolio Management	ECON1001 Actuarial Economics

Source: <http://handbook.curtin.edu.au/courses/31/319306.html>

¹⁰ First- and second-year study plans will come into effect in 2020 and 2021 respectively.

Third year streams 2022 onward¹¹

Note that those who commenced their degree in 2019 and prior should consult the study plan [above](#).

Year 3 (Actuarial & Applied Stats)		OR	Year 3 (Actuarial Science) ¹²	
Semester 1	Semester 2		Semester 1	Semester 2
MATH3008 Survival Models & Analysis	MATH3004 Industrial Project		MATH3008 Survival Models & Analysis	STAT3009 Risk Analysis
STAT2003 Analytics for Experimental & Simulated Data	STAT2004 Analytics for Observational Data		MATH3009 Contingencies 1	MATH3010 Contingencies 2
STAT3000 Statistical Inference	Option (choose 1) INDE2001 Logistics Models & Optimisation INVE3000 Intro to Derivative Securities INVE3001 Portfolio Management MATH2000 Network Optimisation		STAT3010 Financial Engineering 2	STAT3008 Provisioning techniques
Elective ⁷ (choose 1)	Elective ⁷ (choose 1)		Unknown ¹³	Unknown ¹³

Source: <http://handbook.curtin.edu.au/courses/32/322468.html>

<http://handbook.curtin.edu.au/unitSearch.html>¹³

Honours (fourth year) 2020 onward

Note that those who commenced their degree in 2019 and prior should consult the study plan [above](#).

Year 1/ Year 4	
Semester 1	Semester 2
ACTL4000 Actuarial Control Cycle 1	ACTL4001 Actuarial Control Cycle 2
ACTL4003 Predictive Analytics Principles	ACTL4002 Actuarial Asset Liability Management
STAT4004 Actuarial Science Honours Dissertation 1 ¹⁴	ACTL4004 Actuarial Risk Management
	STAT4001 Actuarial Science Honours Dissertation 1

Source: <http://handbook.curtin.edu.au/courses/31/319305.html>

¹¹ These third-year stream study plans will not actually come into effect until the year 2022 (when those that commenced their degrees in 2020 reach their third year).

¹² Note that the handbook for the Actuarial Science third-year stream is absent from the [actuarial science handbook](#) at the time of writing, so this is only an anticipated ordering. The handbooks for units were found by searching “STAT3” and “MATH3” in the [Curtin unit handbook search from](#). The syllabi of these newfound units were then compared with the actuarial curriculum to determine where they fit in with regard to exemptions.

¹³ As the handbook for the Actuarial Science third-year stream is yet to be released, this final slot in each semester is unknown, but is likely to be either a list of options (similar to those available in the second semester of the Actuarial & Applied Stats third-year stream) or electives.

¹⁴ Note that this unit is worth 50 credits points (double those of a normal unit).

Postgraduate: Master of Science (Actuarial and Financial Science)

The masters program allows students who have completed a quantitative (but not actuarial) bachelor's degree in the past and wish to pursue the actuarial pathway. It is equivalent to the three-year undergraduate actuarial science degree at Curtin in the sense that it is designed to provide exemption from the actuarial Foundation subjects (previously part I). Note however that its 1.5-year duration means it is insufficient to cover every subject (you will always miss out on one) and it does not cover the Actuary subjects.

Masters study plan

Note that:

- » Units in **bold** below are core units and the remaining units are optional (select 3).
- » A maximum of 2 core units can be replaced with optional units.
- » Keep note of the footnotes that reference where you can select between two alternatives. Such units will be in ***bold italics***.
- » Other optional units can be taken upon consultation with course coordinator.

Availability		
Semester 1	Semester 2	Both
STAT5003 Investment Science 1	<i>STAT5004 Investment Science 2¹⁵</i>	MATH5001 Mathematics Masters Project 1
MATH5009 Life Contingencies 1	<i>INVE5001 Advanced Derivative Securities¹⁶</i>	<i>FNCE5000 Advanced Corporate Finance and Theory¹⁷</i>
MATH5011 Survival Analysis	<i>STAT5007 Stochastic Processes¹⁸</i>	FNCE5011 Contemporary Issues in International Finance
NPSC5000 Science Masters Research Methodologies	STAT5000 Risk Analysis and Credibility Theory	ACCT5013 Intermediate Financial Accounting
MATH5006 Numerical Methods	MATH5000 Theory of Interest	FNCE5008 Financial Principles and Analysis
STAT5008 Mathematical Statistics	ECON5000 Actuarial Economics	
ISAD5000 Advanced Optimisation Techniques	FNCE5003 Advanced Business Financial Modelling	
STAT5002 Statistical Modelling	MATH2005 Practical Mathematical Financial Modelling	
	MATH5010 Life Contingencies 2	

Source: <http://handbook.curtin.edu.au/courses/31/319304.html>

¹⁵ Can alternatively choose FNCE5000 Advanced Corporate Finance and Theory

¹⁶ Can alternatively choose STAT5007 Stochastic Processes

¹⁷ Can alternatively choose STAT5004 Investment Science 2

¹⁸ Can alternatively choose INVE5001 Advanced Derivative Securities

Master to undergraduate unit correspondence table

All the exemption subjects in the Masters degree have corresponding undergraduate units that are effectively the same unit. In many cases the only difference between masters and undergraduate units is a slightly different set of questions in the exam.

If you are a masters student, use this table to find the corresponding undergraduate units for your masters units. Where you see the name of one of these undergraduate units anywhere in this document (the [unit guides](#) and [Actuaries institute subject mapping](#) in particular), you can take it as interchangeable for the corresponding masters units in most cases.

Masters Unit	Undergraduate Unit	Exemption
ECON5000 Actuarial Economics	ECON2001 Actuarial Economics	CT7/CB2
MATH5000 Theory of Interest	MATH2004 Theory of Interest	CT1/CM1
MATH5009 Life Contingencies 1	MATH3006 Life Contingencies 1	CT5/CM1
MATH5010 Life Contingencies 2	MATH3007 Life Contingencies 2	CT5/CM1
STAT5003 Investment Science 1	STAT3006 Investment Science 1	CT8/CM2
STAT5004 Investment Science 2	STAT3007 Investment Science 2	CT8/CM2
STAT5008 Mathematical Statistics	STAT2001 Mathematical Statistics	CT3/CS1
STAT5007 Stochastic Processes	STAT3005 Stochastic Processes	CT4/CS2
STAT5002 Statistical Modelling	STAT3001 Statistical Modelling	CT6/CS2
STAT5000 Risk Analysis and Credibility Theory	STAT3002 Risk Analysis and Credibility Theory	CT6/CS2

Check the [table above](#) for further information on exemptions.

Choosing alternative, optional and elective units

While the actuarial science degree is fairly inflexible due to the large amount of content it must cover to be accredited by the Actuaries Institute, there are still a handful of times students can make a choice about what units they take.

Please refer to the unit guides [below](#) for more detailed descriptions of each unit we mention here.

Alternative units

This is where you get to choose between two units (it will say “OR” between two units in the [handbook](#)). In the case of actuarial science, first year maths units and economic units are examples of alternative units.

If you really enjoyed Mathematics Specialist in High School, you should choose [MATH1017](#) in your first year. You will be extended in this unit and have a slight advantage in future units compared to those who chose [MATH1015](#).

Optional and Elective units

This is where you choose a unit (or units) from a list of options, usually totally between 4 and 6 units. In the actuarial science degree, you get optional units in both second and third year. Consult the Curtin Handbooks of eStudent for this list. Some students depart from the list through negotiation with the course coordinator. Python is a useful skill in data science but it is not taught by default in the actuarial degree at Curtin. If you want to learn the Python language, [COMP1005](#) (Fundamentals of Programming) is an excellent optional unit to choose.

Electives can be used to take any unit at Curtin, provided you satisfy the conditions of enrolment.

It is often a good idea to decide of what you want to learn more about and then use the units taken by other degrees in that area to help you decide.

- » If you want to learn more programming and data science look at the data science handbook.
 - ↳ Data science: <http://handbook.curtin.edu.au/courses/32/320724.html>
- » If you want to learn more economics, finance and business, look at some of the commerce majors.
 - ↳ First year commerce: <http://handbook.curtin.edu.au/courses/32/322286.html>
 - ↳ General commerce majors: <http://handbook.curtin.edu.au/courses/32/322389.html>
 - ↳ Accounting and finance majors: <http://handbook.curtin.edu.au/courses/32/322388.html>
- » If you want to learn more maths, look at the handbook for the two mathematical majors.
 - ↳ Financial mathematics: <http://handbook.curtin.edu.au/courses/32/320729.html>
 - ↳ Industrial and applied mathematics: <http://handbook.curtin.edu.au/courses/32/320715.html>

Things to watch out for:

- » To be eligible for graduation, Curtin students cannot exceed 250 credits of first year units (units with unit code numbers in the 1000s).
- » You must satisfy the prerequisites.

A Comparison of Third Year Streams

In the third year of the Actuarial Science degree, students may choose between two streams:

- » [Actuarial Science Major](#)
- » [Actuarial and Applied Statistics Major](#)

As students draw closer to making this decision, they will usually be provided with some guidance on the matter from the faculty. Here we will provide our own comparison of each stream to further assist students in their decision-making process.

First, it should be stated that each stream has its own benefits and each will fit particular individuals differently. The Actuarial Science stream is designed to complete the first stage of the actuarial accreditation process, whereas the Actuarial and Applied Statistics stream abandons this endeavour in favour of a broader, more flexible final year. As Curtin does not actually offer a statistics degree directly, this second option is as close as you can get to obtaining a statistics degree from Curtin.

If you are a high performing student with the intention to become an Actuary, the Actuarial Science stream is the best choice for you.

Conversely, if you have secured a graduate position in an area that is not actuarial via vacation work for example, you might be better suited to the Actuarial and Applied Statistics major as it will allow you to develop skills for your upcoming employment. This would be as opposed to choosing the Actuarial Science major and learning about actuarial concepts which will not be applicable to you.

Many students find the Actuarial Science stream quite challenging due to increase in workload. The course handbook prescribes taking four of the most challenging CT exemption units simultaneously in first semester, followed by three more that build on this knowledge in semester 2. If you failed to meet the exemption requirements for multiple CT subjects prior to commencing third year (particularly Theory of Interest and Stochastic Processes in second year), you are probably better off doing the Actuarial and Applied Statistics stream. This is because the main objective of the Actuarial Science stream is to cover all 8 exemptions.

If you would like to be an actuary but are also concerned about the difficulty of the Actuarial Science stream, you could consider studying part-time. This will lengthen your degree but also allow you give you a higher chance of success in gaining exemptions.

Note that the applied statistics stream has undergone changes (i.e. removed STAT3003 Applied Statistics) that are yet to be removed from the course handbook as at the time of release of this document.

The Actuarial Science Honours Program

In this section, we describe the honours course in detail. In keeping with the rationale of the SAS Guide, all information is provided by students who have previously studied the honours course. Note that this information is based on 2019, prior to the significant 2020 curriculum changes so much of it is subject to some degree of change.

This section will be of interest both to those who are considering taking the honours course full time or those who are considering just taking the actuarial exemption units not-for-degree, as a private candidate (usually whilst also working full time).

Why you should(n't) do honours

If you want to become an actuary (that is, a fellow or an associate), you need to study the actuarial control cycle and the new data analytics subject through a university a university that is accredited by the Actuaries Institute (Curtin is the only one in Perth). Full-time honours is probably the most direct way of doing so. Unless your employer provides unfathomably generous study leave, it is easier being a full-time student than take the units while working.

If you are tired of university, it is advisable that you do not do honours, it is a highly intense year of university that will test even the highly motivated.

What the classes are like

Classes are almost always scheduled in the evening to accommodate those who take the part II units while working (say goodbye to 8AM starts). The earliest class experienced by or known to past students in actuarial honours units started at 3PM. Classes are likely to finish at 6, 7 or even 8 PM.

At the time of writing (in semester 2 2019), only 3 people do full-time honours, with 4 others picking up the honours units required for part II (associate level) exemptions only. These are in fact big numbers by comparison to previous years where as few as 2 people have taken honours units in total. As a result, all 2019 actuarial honours classes have had between 4 and 6 students enrolled in them. This makes for a very different dynamic in classes compared to what you'd be familiar with from your first three years of study. Firstly, classes are far more personal. While lecturers might have material prepared, lectures often flow into more of a conversation, led by the lecturer (pre-reading is therefore essential). Secondly, following on from this, if you miss a class, your absence will be felt. Skipping classes is really not an option.

Tips for success

The key to actuarial honours (or indeed taking actuarial honours units as a private candidate) is time management. You will be juggling challenging coursework with either full-time work or the honours

research project (dissertation). Implementing a system to keep on top of weekly readings as well as assessments will be highly beneficial.

Classes of honours

One element of academic achievement is the so-called *class of honours* one receives. If you receive “First Class Honours”, this will be indicated on your degree upon graduation.

The following table indicates the guidelines (subject to review by an Honours Committee) for classes of honours as of 2019 (changes may occur in 2020 onwards). You must satisfy all criteria to be awarded that class of honours (i.e. meet both the CWA and project mark requirement).

Class of honours	Minimum CWA	Minimum project mark
First Class	80%	80%
Upper Second Class	65%	70%
Lower Second Class	60%	60%
Third Class	50%	50%
Fail	Failure to meet either of the third class honours requirements	

Note that:

- » The project mark is included in the calculation of CWA.
- » As a rule of thumb, 80% in the project means “a thorough understanding of the topic was demonstrated”.

Actuarial Science Formulae and Tables

The “Formulae and Tables for Examinations of the Faculty of Actuaries and the Institute of Actuaries” is a resource that all actuarial students in the later stages of their degree would be familiar. Also (more concisely) known as the “orange book”, it is a document that was created in 2002 which is used by actuarial students in all countries whose actuarial societies follow the same curriculum as the Institute and Faculty of Actuaries of the UK. Also note that in spite of the orange book being created in 2002, the actuaries institute are **not** introducing a new formula and tables for the new curriculum (at least initially).

Although this book is available for purchase online via both the UK institute website and Co-op bookstore, Curtin actuarial students **need not** purchase it. This is owing to the fact that “Actuarial Science - Select Formulae”, a document that contains only the “formulae” section from the orange book, is generally uploaded to Blackboard in the units where it is required. In addition to this, any relevant tables from the orange book (e.g. life tables) are generally uploaded individually as well. This abridged version of the orange book is sometimes referred to as the “new tables”. Here, the word new is slightly misused given what it actually means is: *new in 2002*. This comes out of the fact that the orange book actually replaced the previous actuarial tables and formula, known as the “green book” (created in 1980).

It is often the case that **instead** of providing the “statistical distributions” section from the orange book, [Mathematical Formulae and Statistical Tables for Tertiary Institutions](#) by Jennifer Bradley is provided to students in exams so familiarity with this is also useful. This particular document is available at the Curtin library (link available by clicking on the name) and is often used in other statistics units at Curtin.

The Actuarial Science - Select Formulae are not needed for every unit at Curtin, only in units

- » That are CT exemption units.

and

- » Where the majority of students are Actuarial Science students.

In the majority of units where the formulae are given, the institute exam conditions are adhered to, which means students may not bring in their own notes and the only formula or tables provided must come from the orange book (Curtin will also provide statistical tables from another source where applicable). It is therefore very important that you are familiar with what formulae you are provided with and what formulae you must memorise or derive for yourself in the exam.

SAS have prepared a separate document which breaks down actuarial formulae, available via the following link:

<https://www.curtinactuary.com/actuarial-formulae/>

This document is particularly useful for third year students.

Unit Guides

Disclaimers

- » By default, this guide assumes that units taken each year are according to the [Curtin Actuarial Science Handbooks](#). We acknowledge that variations may exist for students pursuing alternative study plans. Information relating to the timing of events (e.g. the semester in which a unit is taken) should fit the majority of people with some exceptions.
 - ↳ The unit guides are designed to provide information that might be of use to students. That being said, it is subjective in nature and should be interpreted as such. While we try to remain objective, the biased opinion of the author coming through in some fashion is an inevitability. To this end in part, we have refrained from identifying or making any direct personal comments about lecturers, as this document is not designed to rate the performance of lecturers. We have chosen to do this to avoid any material in this document being interpreted as potentially unfair or defamatory.
- » It is the responsibility of the reader of this guide to check the validity of information provided. Many of the [useful links](#) above can help with this.
 - ↳ For example, to check the credibility and relevance of information we encourage readers of this guide to check if the lecturer has changed. One way of doing this would be to check the [unit outline](#). We will endeavour to indicate this if the information is known to us, but you may know before we know or be looking at an older version of this document in which, such information was not known.
- » Where appropriate, we have used past tense to indicate that these are past experiences of the units that will not necessarily follow through to future offerings. Quote ASIC: “Past [experience] is not a reliable indicator of future [experience]”.

First Year Units

Semester 1

ACCT1000 Accounting- The Language of Business

Unit nickname	Previous unit name	
Accounting	Introduction to Accounting (2018)	
Challenge rating	Type of unit	Exemption
0.5	Previously compulsory (now replaced by ACCT1002)	CT2 → CB1
Information based on		Availability
Semester 1 2019 (same as Semester 1 2018)		Both Semesters (still run in spite of being removed from the actuarial science degree)
Prerequisites for this unit...		This unit is a prerequisite for...
Nil		There are no units commonly taken by actuarial students for which this unit is a prerequisite.

Reliability of information

As [ACCT1002](#) is being delivered for the first time in 2020, use this unit as some indication of what to expect. Note however this unit will continue to run in 2020 and they are still different units so experience will not be identical.

We suggest you check the [published unit outlines](#) for more information.

Syllabus/ Topics

- » Managerial accounting
 - ↳ Decision making and capital expenditure
 - ↳ Budgeting and cash management
- » Business sustainability
- » Financial accounting
 - ↳ Recording business transactions
 - ↳ Goods and services tax
 - ↳ End of period adjustments and closing entries
 - ↳ Financial statements
- » Accounting information systems and internal control

Assessments

Assessment name	Weighting
Mid Semester Test	25%
Online workbook	25%
Exam	50%

Learning activities

Lecture (1.5 hours)

Practice questions were intermittently displayed on the slides. A more than sufficient amount of time was typically given for students to attempt them however solutions were not always provided.

Half of the lectures were spent recapping the previous lecture.

Review Lectures were also provided the week before an assessment, going over the structure of the assessments and what sort of questions to expect.

Workshop (1.5 hour)

Workshops were one hour, once a week. Students were given handouts with questions set by the lecturer and worked together as a class to finish them. Answers were only available in the workshop throughout the lesson to encourage attendance.

iLectures Quality

Learning activities recorded: Lecture

Teaching style lent itself to being recording: somewhat

The lecturer walked around a bit so naturally, the camera moved too. Writing on the board was often hard to read on the iLectures and was probably the only thing you would miss if you only watched the recordings.

Learning materials

Textbook

Textbook reference: Introduction to Accounting (ACCT1000) Custom publication for Curtin University by Wahseem Soobratty

Textbook importance: Useful

The textbook was primarily used for the homework questions which were a valuable asset for exam preparation. The lecturer authored the textbook and so most of the information from the slides come directly from the textbook.

It is recommended you buy the textbook, however some students performed adequately without it.

List of other learning materials

- » Lecture Slides (powerpoint)
- » Workshop materials

Usefulness of learning materials

The lecture slides were sufficient for learning content. The content in the textbook were quite similar to the slides since they were both written by the lecturer. The slides for formatted in a condensed and simple to follow fashion.

General comments

Assessments were reasonably straight forward; the lecturer gave us everything we needed to prepare for exam questions during the revision lectures.

It is highly recommended that you attend or watch the revision lectures as they reveal a lot about the exam.

Industry knowledge

Computer languages and software

None.

Industry practice

Although the level is very basic in this unit, knowledge of balance sheets and budgeting is always useful in the business world.

Links to other units

Useful knowledge from previous units

Doing accounting in high school makes this unit even easier.

Overlap with other units commonly taken concurrently

N/A

Useful topics for future units

The idea of cashflows and time value of money is of importance again in [FNCE2000](#).
An understanding of balance sheets is used again in third year units [MATH3006](#) and [STAT3007](#) as a minor part of some explanations.

ACCT1002 Financial Decision Making

Unit nickname	Previous unit name	
N/A	N/A	
Challenge rating	Type of unit	Exemption
?	New Compulsory unit	CT2 → CB1
Information based on	Availability	
This is a new unit as at the date of publishing, we will endeavour to review it once it has been delivered for the first time	Semester 2 only	
Prerequisites for this unit...	This unit is a prerequisite for...	
Nil	Nil	
Reliability of information		
This is a new unit at the time of release of this document. See ACCT1000 for a previously reviewed unit that will have some resemblance this unit (but will not be identical). We have provided as much information as we can find without input from those who took the unit. We suggest you check the published unit outlines for more information.		

Syllabus/ Topics

- » Managerial accounting
 - ↳ Decision making
 - ↳ Capital expenditure
 - ↳ Budgeting and cash management
- » Financial accounting
 - ↳ Financial statements
 - !! Balance sheets
 - !! Income statements
 - !! Bank reconciliation statements
 - ↳ Investment strategies
 - ↳ Triple bottom line reporting

Learning activities

Lecture (1.5 hours)

Tutorial (1.5 hours)

Industry knowledge

Computer languages and software

Unknown

Links to other units

Students may wish to see ACCT1000 (Introduction to Accounting) as an older version of this unit.

Useful knowledge from previous units

N/A

Overlap with other units commonly taken concurrently

N/A

Useful topics for future units

Income statements and balance sheets are featured in [STAT3007](#) (Investment Science 2).
Investment strategies are featured in both [STAT3006](#) and [STAT3007](#)

Corporate finance knowledge is useful for [FNCE2000](#) (Intro to Finance Principles) and [MATH2004](#) (Theory of Interest)

ACTL1001 Principles of insurance and superannuation

Unit nickname	Previous unit name
POIS	N/A
Challenge rating	Type of unit
3	Previously a compulsory (now replaced by ACTL1002) N/A
Information based on	Availability
Semester 1 2019 (edited from Semester 1 2018)	No longer offered
Prerequisites for this unit...	This unit is a prerequisite for...
Nil	Nil

Reliability of information

We suggest you check the [published unit outlines](#) for more information.

Syllabus/ Topics

- » Insurance
 - ↳ Products
 - ↳ Reinsurance
 - ↳ Pricing
 - ↳ Legislation and regulation
- » Superannuation
 - ↳ Types of superannuation
 - ↳ Superannuation benefits
 - ↳ Taxation
 - ↳ The role of the trustee
 - ↳ Legislation and regulation
 - ↳ Contributions and investments

Assessments

Assessment name	Weighting
Tutorial Questions	10%
Superannuation Assessment	20%
Insurance Assessment	20%
Exam	50%

Learning activities

Lecture (2 hours)

In lectures, the lecturer would present information on PowerPoint slides and explain some points in detail. Some students found the content somewhat dry.

The lectures were based on pure explanation and clarification by the lecturer with seldom few example questions.

Tutorial (1 hour)

Participation and attendance were assessed in tutorials. We were given worksheets to solve using the theory learnt in the previous lectures.

Being familiar with the content from the lectures for the week is advised.

iLectures Quality

Learning activities recorded: Lecture

Teaching style lent itself to being recording: no

The lecturers have a tendency to walking away from the microphone so it can be hard to listen to their voices. When they wrote on the board the camera was unable to record their handwriting clearly (this may change in a different venue). These occurrences were rare however.

Learning materials

Textbook

Textbook reference: Probability and Statistics for Engineers and Scientists by Walpole, R.E., Myers, R.H., Myers, S.L., and Ye, K.

The text book is certainly not for everyone but it does provide some additional practice for those who want it. It is also useful for other units such as [STAT1002](#), [STAT1000](#) and [STAT2001](#).

List of other learning materials

- » Workshop questions (hardcopy, pdf) and solutions (pdf)
- » Lecture slides (pdf)
- » Past tests and exams – blank and solutions (pdf)
- » Lecture slides (powerpoint)
- » Tutorial questions/ answers (pdf)

Usefulness of learning materials

Lecture slides:

The lecture slides were sufficient to learn from without the aid of a textbook however there were some unnecessary details that were not assessed. Be sure to ask the lecturer if you are unsure what is and isn't assessable.

Tutorial questions:

The tutorial questions were fairly useful for reinforcing understanding the content.

General comments

The disparity between the amount of information given versus the content required for the unit was significant.

The PowerPoint for each week was often quite lengthy and some of the information was unnecessary for assessment purposes. Some of the content also appeared to require a deeper level of understanding than provided in lectures.

If you are unsure what is or isn't assessable content, it is best to contact the lecturer.

As this is more of a rote-learning unit (as opposed to a mathematical unit) many students find it challenging. Do not take studying for the exam lightly.

Industry knowledge

Computer languages and software

Software: Excel (2018)

2018: For those who haven't used excel prior to university, this will be your first opportunity to hone your skills as it is used in an assignment.

2019: There was no Excel-based assignment in 2019.

Industry practice

Knowledge of the regulations that relate to insurance and superannuation is important for an actuarial student.

Links to other units

Useful knowledge from previous units

N/A

Overlap with other units commonly taken concurrently

N/A

Useful topics for future units

The annuity notation covered in this unit appears again in [MATH2004](#) (Theory of Interest). But as it is taken 3 semesters later, most students will have forgotten it by then.

The excel-based assessment in this unit assist students in strengthening fundamental excel skills for future excel- based units, [ACTL1000](#) and [MATH2005](#).

ACTL1002 Introduction to Actuarial Science

Unit nickname		Previous unit name
N/A		N/A
Challenge rating	Type of unit	Exemption
?	Compulsory	N/A
Information based on		Availability
This is a new unit as at the date of publishing, we will endeavour to review it once it has been delivered for the first time		Semester 1 only
Prerequisites for this unit...		This unit is a prerequisite for...
Nil		Nil

Reliability of information

This is a new unit at the time of release of this document. Consult [ACTL1001](#) and [ACTL1000](#) for similar units.

We have provided as much information as we can find without input from those who took the unit.

See [ACTL1001](#) (Principles of Insurance and Superannuation) as this is the old unit that is expected to be most similar.

We suggest you check the [published unit outlines](#) for more information.

Syllabus/ Topics

- » Operation of insurance, superannuation and banking industries
- » Pricing uncertain events and risk management
- » Actuary industry examples

Learning activities

Lecture (2 hours)

Workshop (2 hour)

Industry knowledge

Computer languages and software

None.

Links to other units

Useful knowledge from previous units

N/A

Overlap with other units commonly taken concurrently

N/A

Useful topics for future units

N/A

MATH1015 Linear Algebra 1

Unit nickname	Previous unit name
Linear Algebra	N/A
Challenge rating	Type of unit
1	Optional
	Exemption
	N/A
Information based on	Availability
Semester 1 2019 (same as Semester 1 2018)	Both Semesters
Prerequisites for this unit...	This unit is a prerequisite for...
Nil	STAT2001
	MATH2004
	MATH2005
	MATH2010
	MATH2011
	MATH2015

Reliability of information

We suggest you check the [published unit outlines](#) for more information.

Syllabus/ Topics

- » Complex numbers
- » Vectors and matrices
- » Applications of matrices
- » Determinants
- » Lines and planes
- » Vector spaces
- » Eigenvectors and eigenvalues

Assessments

Assessment name	Weighting
Workshop Assessment	15%
Online Quiz	10%
Mid Semester Test	25%
Exam	50%

Learning activities

Lecture (2 hours)

There was one two-hour lecture a week. The lectures were very thorough, though a little fast-paced at times. The concepts were explained in many different ways (equations, diagrams, proofs etc.) which catered to different types of learners.

Lecture slides were printed out for students to annotate during the lecture (in 2019 this did not occur due to a different lecturer). On these lecture slides were many examples (which the lecturer explained during the lecture) and sample exercises (some questions which students were given time to attempt during the lecture), which gave students a chance to consolidate the new knowledge. Students that completed year 11

Mathematics Specialist in high school will be familiar with most of the content. Many students performed adequately without physically attending the majority of lectures.

Workshop (2 hours)

Workshops were two hours long, once a week. Tutors gave their students handout(s) with a set of questions similar to the sample exercises found in the lecture. They were strongly encouraged to work through the questions on a whiteboard along with the other students in the workshop. Many students found that if they understood the material from the lecture, the workshop questions were not difficult. Majority of the earlier workshops were finished within the first hour, allowing you to leave earlier if you had finished. Any questions can be asked directly to the tutor. Answers to the questions were also provided. During the semester, there were two workshop assessments, which were essentially tests that were conducted during designated workshops. Attendance was not assessed but attendance was beneficial for students to ask fellow students or their tutor for help if they were struggling with any of the questions.

iLectures Quality

Learning activities recorded: lecture

Teaching style lent itself to being recording: yes

All material was displayed on the projector (and hence, all of it was shown in the iLecture). When writing out explanations of the examples in the slides, the lecturer would annotate directly onto the PowerPoint, which was shown in the iLecture. If the slides could not be displayed on the screens, then the lecturer would use a camera that would display their writing onto the screens. The iLectures were the same as being there (interactivity aside).

Learning materials

Textbook

No textbook was prescribed for this unit.

List of other learning materials

- » Lecture slides materials- blank and annotated (pdf)
- » Workshop questions- blank and solutions (pdf)
- » Notes for each lecture from a previous semester (pdf)
- » Past test and exam papers- blank and solutions (pdf)

Usefulness of learning materials

The lecture slides explained the concepts very well. The questions in the notes from the previous semester, along with the workshop questions provided good practice to ensure you understood all the concepts thoroughly.

General comments

The concepts taught were not so complicated that an extra hour or so after the lecture would not clarify. The assessments were all easy if you went through the lecture material, workshop questions and the past assessments. The study load is easily manageable. The lecturer was exceptional, as they were thorough and gave clear explanations. The test questions were very similar to all the provided practice questions with rarely new types of questions appearing in the tests.

Industry knowledge

None.

Industry practice

None.

Links to other units

Useful knowledge from previous units

If you completed maths specialist in high school, most of the content is the same except for a few extra concepts, majority following of year 11 specialist.

Overlap with other units commonly taken concurrently

N/A

Useful topics for future units

All of the content in this unit is used extensively in [MATH2010](#) (Linear Algebra 2)

MATH1017 Advanced Mathematics 1

Unit nickname

Accelerated 1

Previous unit name

Accelerated mathematics 1 (2018)

Challenge rating Type of unit

3.5

Compulsory

Exemption

N/A

Information based on

Semester 1 2019

(edited same as Semester 1 2018)

Availability

Semester 1 only

Prerequisites for this unit...

It recommends students to have achieved above 70% in ATAR Maths Specialist.

This unit is a prerequisite for...

[MATH1018](#)[STAT2001](#)[MATH2004](#)[MATH2005](#)[MATH2010](#)[MATH2015](#)

Reliability of information

We suggest you check the [published unit outlines](#) for more information.

Syllabus/ Topics

- » Proof techniques
 - ↳ Mathematical notation and logic
 - ↳ Disproof by counterexample
 - ↳ Direct proof
 - ↳ Proof by contradiction
 - ↳ Proof by induction
- » Functions
 - ↳ Domain, codomain, range
 - ↳ Composite functions
 - ↳ Inverse of functions
 - ↳ Odd and even functions
 - ↳ Curve drawing
 - ↳ Mean value theorem, Rolle's theorem, intermediate value theorem
- » Limits
 - ↳ Limit algebra
 - ↳ Limits to infinity
 - ↳ Squeeze theorem
 - ↳ L'Hospital's rule
 - ↳ One-sided limits
- » Review of trigonometry and trigonometric identities
- » Calculus
 - ↳ Review of integration and differentiation
 - ↳ Implicit differentiation
 - ↳ Integration by parts and "tabular" integration
 - ↳ Integration by partial fractions
 - ↳ Reduction formulae for integrals
- » Sequences
 - ↳ Recursively defined sequences
 - ↳ Linear difference equations

- » Numerical methods
 - ↳ For approximating roots : bisection method , Newton’s method
 - ↳ For approximating integrals: midpoint Rule, trapezoidal rule and Simpson’s rule
- » Complex numbers
 - ↳ Review of complex numbers
 - ↳ Geometrical aspects
- » Linear Algebra
 - ↳ Concept of linearity
 - ↳ Review of matrices
 - ↳ Gaussian elimination
 - ↳ Gauss – Jordan method
 - ↳ Dot and cross product
 - ↳ Linear transformations
 - ↳ Determinants
 - ↳ Vector spaces
 - ↳ Subspaces
 - ↳ Linear independence
 - ↳ Eigenvalues and eigenspaces
- » Brief overview of miscellaneous topics
 - ↳ Conic sections
 - ↳ Group theory
 - ↳ Taylor and Maclaurin Series

Assessments

Assessment name	Weighting
Workshop assessment	15%
Laboratory assessment	15%
Mid semester test	20%
Examination	50%

Learning activities

Lecture (2 hours)

Lectures consist of lengthy examples and a very thorough investigation of the foundational principles of the listed topics. Attendance, particularly in the front few rows, is very strongly advised due to iLecture quality. It allows students to clarify more challenging aspects of the theory. Significantly more content is taught than assessed and time spent teaching a topic is not a good indication of whether it is assessable.

Tutorial (1 hour)

N/A

Workshop (1 hour)

The workshops are quite similar to lectures although they sometimes include assessed in-class tests in which you could also score “bonus marks”.

iLectures Quality

Learning activities recorded: lecture

Teaching style lent itself to being recording: no

iLecture recording is variable and heavily room dependent, however, mini-iLectures were made available for most topics either from previous years or in optional extra learning sessions. The lecturer primarily wrote in small type on the board and the camera was often unfocussed making visibility an issue.

Learning materials

Textbook

Textbook reference: Calculus, 7th Edition by Stewart, J.

Textbook importance: unnecessary

The lecturer was regularly disparaging of the textbook and instead recommended an alternative written by Spivak. Stewart does, however, provide a more simplistic entry point to many of the more complex topics covered and includes practice questions with answers.

List of other learning materials

- » Worksheets (pdf)

Usefulness of learning materials

The workshop questions did not include answers (these were instead worked through upon request in workshops and lectures). They were indicative, however, of the types of questions that may be asked.

General comments

The theory in the unit could be quite difficult, however, the bonus marks allow many students to score highly despite this. The mid-semester exam is considered notoriously difficult due to a lack of preparation by students and a deliberate effort by the lecturer to drill down on concepts. The final exam often follows a predictable format of question types and topics. Doing the online quizzes also helps to buffer your mark as well as increase your understanding. The lecturer had a rather idiosyncratic style. Should the lecturer change, this unit will likely change considerably. This unit should only be taken by those who are passionate about mathematics. [MATH1015](#) is a far easier alternative for those who do not care much for the intricacies of mathematics and are happy to just fulfil the minimum requirements. It is however a very rewarding unit and put you at an advantage in terms of your mathematical background for future units.

Industry knowledge

Computer languages and software

None.

Industry practice

Should you have aspirations to work in mathematical academia, this unit provides you with an excellent introduction to elegance and rigour in mathematics.

Links to other units

Useful knowledge from previous units

Knowledge from maths specialist in high school is assumed in this unit although many topics are also reintroduced.

Overlap with other units commonly taken concurrently

N/A

Useful topics for future units

Solutions to linear difference equations are encountered again (but this time without proof) in [STAT3001](#). The proof techniques, logic and mathematical notation in this unit provide a solid foundation for any future units that require any form of proof or derivation.

NPSC1003 Integrating Indigenous science and STEM

Unit nickname	Previous unit name	
N/A	N/A	
Challenge rating	Type of unit	Exemption
?	New Compulsory unit	N/A
Information based on	Availability	
This is a new unit as at the date of publishing, we will endeavour to review it once it has been delivered for the first time	Semester 1 only	
Prerequisites for this unit...	This unit is a prerequisite for...	
Nil	Nil	

Reliability of information

This is a new unit at the time of release of this document.

We have provided as much information as we can find without input from those who took the unit.

This unit is replacing the old unit, [COMS1000](#). It is significantly different but that unit guide might provide some insight for students.

We suggest you check the [published unit outlines](#) for more information.

Syllabus/ Topics

- » Introduction to indigenous history, culture, knowledge and practices and the value and contribution of indigenous science to global challenges.
- » Written, visual and oral presentation techniques
- » Inter-cultural awareness and academic integrity
- » Scientific inquiry methods

Learning activities

Lecture (1 hours)

Workshop (2 hour)

Industry knowledge

Computer languages and software

None.

Links to other units

Useful knowledge from previous units

N/A

Overlap with other units commonly taken concurrently

N/A

Useful topics for future units

N/A

STAT1001 Statistical Probability

Unit nickname	Previous unit name	
Stat Prob	N/A	
Challenge rating	Type of unit	Exemption
2	Previously a compulsory unit (now replaced by STAT1005).	CT3 → CS1
Information based on	Availability	
Semester 1 2019 (edited from Semester 1 2018)	No longer offered	
Prerequisites for this unit...	This unit is a prerequisite for...	
Nil	STAT2001	

Reliability of information

Note that this unit will be changed or replaced in 2020 due to Curtin's policy decision to remove half units. We suggest you check the [published unit outlines](#) for more information.

Syllabus/ Topics

- » Introduction to and definitions of probability
- » Counting techniques
- » Conditional probability
- » Bayes Rule
- » Discrete random variables and their distributions
- » Continuous random variables and their distributions
- » Joint probability
- » Expectation, variance and covariance
- » Independence of random variables
- » Central limit theorem
- » Functions of random variables
- » Chi-squared tests (goodness of fit, independence, homogeneity)

Assessments

Assessment name	Weighting
Test 1	25%
Test 2	25%
Examination	50%

Learning activities

Lecture (2 hours)

Practice questions were intermittently displayed on the slides. A more than sufficient amount of time was typically given for students to attempt them however solutions were not always provided.

Half of the lectures were spent recapping the previous lecture.

Workshop (1 hour)

Workshops were one hour, once a week. Students were given handouts with questions set by the lecturer. Answers were available online at the end of the week, but students could ask the tutor to check if their answers were correct during the workshop.

iLectures Quality

Learning activities recorded: Lecture

Teaching style lent itself to being recording: Yes

The lecturer walked around a bit so naturally, the camera *moved too*. *Writing on the board was often hard to read on the iLectures and was probably the only thing you would miss if you only watched the recordings.*

Learning materials

Textbook

Textbook reference: Probability and Statistics for Engineers and Scientists by Walpole, R.E., Myers, R.H., Myers, S.L., and Ye, K.

Textbook importance: Unnecessary

The text book is certainly not for everyone but it does provide some additional practice for those who want it. It is also useful for other units such as [STAT1002](#), [STAT1000](#) and [STAT2001](#).

List of other learning materials

- » Workshop questions (hardcopy, pdf) and solutions (pdf)
- » Lecture slides (pdf)
- » Past tests and exams – blank and solutions (pdf)

Usefulness of learning materials

The difficulty of workshop questions was often higher than that of the assessments which made them good practice. The lecture slides were repetitive at times, with some occasionally difficult to follow sentence structure. They were however more than satisfactory to do well in the unit.

General comments

Most students found this unit straightforward.

The first test did not require any knowledge from the lectures. In addition, tests and the exam were similar to the past papers provided.

Industry knowledge

Computer languages and software

None.

Industry practice

None.

Links to other units

Useful knowledge from previous units

N/A

Overlap with other units commonly taken concurrently

[STAT1002](#) (Statistical Data Analysis) - normal distribution, hypothesis testing.

Many probability concepts from Maths Methods in high school come up in this unit (such as Bernoulli and binomial distributions).

Useful topics for future units

Knowledge from this unit including random variables, expectation and probability distributions prepares you for [STAT2001](#). Goodness of fit tests are used in [MATH3005](#), [STAT3001](#) and [STAT3002](#).



STAT1002 Statistical Data Analysis

Unit nickname	Previous unit name
Stat Data	N/A
Challenge rating	Type of unit
2	Previously a compulsory unit (now replaced by STAT1005).
	Exemption
	CT3 → CS1
Information based on	Availability
Semester 1 2019 (edited from Semester 1 2018)	Soon to be no longer offered
Prerequisites for this unit...	This unit is a prerequisite for...
Nil	STAT2001
Reliability of information	
Note that this unit will be changed or replaced in 2020 due to Curtin's policy decision to remove half units. We suggest you check the published unit outlines for more information.	

Syllabus/ Topics

- » The role of statistics
- » Numerical and graphical summaries
- » Sampling
- » Normal distribution
- » Density curves
- » Detection of outliers
- » Confidence intervals
- » Sampling distribution of proportions
- » Sampling distribution of the mean
- » The t-distribution
- » Hypothesis testing
- » Comparison of two means
- » ANOVA
- » Basics of simple linear regression

Assessments

Assessment name	Weighting
Test 1	15%
Test 2	15%
Online Quizzes	20%
Examination	50%

Learning activities

Lecture (2 hours)

Student participation was generally absent and not requested. Half of the lecture was usually a recap of the previous lecture.

Workshop (1 hour)

The tutor briefly explained the core concepts that would be used in the activity for the lab and wrote some notes on the board. Students were then given the rest of the workshop to work on the activity. A set of

questions were available on Blackboard, which students would complete on RStudio. The worksheets were at most, of medium difficulty. The tutor was available to answer any questions students had.

iLectures Quality

Learning activities recorded: Lecture

Teaching style lent itself to being recording: Yes

The iLectures were clear, with the lecture slides displayed and the voice of the lecturer clearly recorded. Notes were rarely written by the lecturer, but when they were, they were annotated onto the PowerPoint and hence viewable on the iLecture. Many students found the iLectures equivalent to physically attending the lecture.

Learning materials

Textbook

Textbook reference: Probability and Statistics for Engineers and Scientists by Walpole, R.E., Myers, R.H., Myers, S.L., and Ye, K.

Textbook importance: unnecessary

The text book is certainly not for everyone but it does provide some additional practice for those who want it. It is also useful for other units such as [STAT1001](#), [STAT1000](#) and [STAT2001](#).

List of other learning materials

- » Workshop questions (hardcopy, pdf) and solutions (pdf)
- » Lecture slides (pdf)
- » Past tests and exams – blank and solutions (pdf)

Usefulness of learning materials

The lecture slides sufficiently covered all of the material.

Industry knowledge

Computer languages and software

Languages: R

Software: RStudio

Industry practice

None.

Links to other units

Useful knowledge from previous units

N/A

Overlap with other units commonly taken concurrently

Statistical Probability: Normal distribution, Hypothesis testing.

Useful topics for future units

The introduction to R, hypothesis testing and simple linear regression in this unit is important for [STAT1000](#) which builds on knowledge from this unit. Hypothesis testing is used in later units including [STAT3001](#) and [MATH3005](#) so it is best that you do not forget how it works.

STAT1005 Introduction to Probability and Data analysis

Unit nickname

Previous unit name

N/A

N/A

Challenge rating Type of unit

Exemption

?

Compulsory unit

CT3 → CS1

Information based on

Availability

This is a new unit as at the date of publishing, we will endeavour to review it once it has been delivered for the first time

Both Semesters

Prerequisites for this unit...

This unit is a prerequisite for...

Nil

[STAT2001](#)

Reliability of information

This is a new unit at the time of release of this document. Consult the unit guides for [STAT1001](#) and [STAT1002](#) for the previous units this is replacing.

We have provided as much information as we can find without input from those who took the unit.

We suggest you check the [published unit outlines](#) for more information.

Syllabus/ Topics

- » Statistical analysis
- » Introduction to probability
 - ↳ Definitions of probability
 - ↳ Probability models
 - ↳ Probability distribution
 - ↳ Statistical inference
- » Statistical Data Analysis
 - ↳ Descriptive/ inferential statistics
 - ↳ Data collection
 - ↳ Introduction to R language

Learning activities

Lecture (1 hours)

Tutorial (1 hour)

Workshop (1 hour)

Industry knowledge

Computer languages and software

Languages: R

Students will be introduced to the R language statistical environment, which they will use for exploring, displaying, and analysing data, and for carrying out and reporting the results of statistical inference.

Links to other units

Useful knowledge from previous units

N/A

Overlap with other units commonly taken concurrently

N/A

Useful topics for future units

Useful skills and knowledge for [STAT1000](#)

Semester 2

ACTL1000 Principles of Actuarial Science

Unit nickname	Previous unit name
N/A	N/A
Challenge rating	Type of unit
2	Previously a compulsory unit (replaced by ACTL1002 and ACTL1003)
	Exemption
	N/A
Information based on	Availability
Semester 2 2017	No longer available
Prerequisites for this unit...	This unit is a prerequisite for...
Nil	Nil
Reliability of information	
This unit will no longer be offered from 2020 onwards.	
We suggest you check the published unit outlines for more information.	

Syllabus/ Topics

- » The roles and duties of actuaries in a range of industries
 - ↳ Insurance
 - ↳ Superannuation
 - ↳ Banking
 - ↳ Financial services
- » Industry dynamics, priorities and everyday experiences from guest speakers
- » Computer labs focusing on technical aspects of Excel, including use of VBA and macros.

Assessments

Assessment name	Weighting
Practical Test in Lab	25%
Exercises	20%
Project	25%
Examination	30%

Learning activities

Seminar (1 hour)

Each week a new guest speaker was invited to speak about their industry and occupation. They varied in length but were rarely much longer than an hour (in spite of the two-hour allotted class length). As the was a different presenter each week the style of presentation varied as well. Questions were strongly encouraged. Any assessment that relied on the seminars, allowed students to choose which presenter(s) they wished to focus on.

Workshop (2 hours)

Tasks were set each week in order to provide a practical understanding of Excel's different functions including VBA. The tutor was willing to assist with the understanding of the various tasks. These tasks we assessable through a submission at a later date and so attendance is recommended.

iLectures Quality

Learning activities recorded: Seminars

Teaching style lent itself to being recording: Yes

Seminars were recorded and iLecture quality was acceptable. Text on slideshows was intermittently unreadable, however, slides were also provided on Blackboard. Little guidance was given for content taught in the labs outside the sessions themselves.

Learning materials**Textbook**

No textbook was prescribed for this unit.

List of other learning materials

- » Notes were sporadically provided in the computer labs for Excel functions, sometimes in the form of slides
- » Pointers about Excel techniques were also provided in generalised documents at the beginning of the unit.

Usefulness of learning materials

Any extra information about Excel required can easily be googled. Microsoft provide helpful descriptions of the attributes and utility of all functions and Stackoverflow provides good coding examples.

General comments

'Free' marks were available through computer labs and the first assignment (which was marked rather generously). The second half of the unit was more polarising, especially the Excel tests. Students with any background in programming will find no difficulty, however, less capable students may find they require a paradigm shift in order to approach the procedural logic required.

Industry knowledge**Computer languages and software**

Languages: VBA

Software: Microsoft Excel

Industry practice

Fantastic advice for interviews, applications and a better understanding of the structure and nature of a wide variety of companies is particularly useful in helping a student to development their own industry experience. Although quite basic, the foundations of financial applications of excel are also very pragmatic.

Links to other units**Useful knowledge from previous units**

The previous excel knowledge you would have gained from the assignment in [ACTL1001](#) will be of some use here.

Overlap with other units commonly taken concurrently

N/A

Useful topics for future units

VBA knowledge is expanded upon once again in [MATH2005](#).

ACTL1003 Introductory Actuarial Practices

Unit nickname

N/A

Previous unit name

[ACTL1000](#) Principles of Actuarial Science

Challenge rating Type of unit

?

Compulsory unit

Exemption

N/A

Information based on

This is a new unit as at the date of publishing, we will endeavour to review it once it has been delivered for the first time

Availability

Semester 2 only

Prerequisites for this unit...

Nil

This unit is a prerequisite for...

Nil

Reliability of information

This is a new unit at the time of release of this document.

We have provided as much information as we can find without input from those who took the unit.

We suggest you check the [published unit outlines](#) for more information.

(above link is for [ACTL1000](#), Principles of Actuarial Science, the old version of this unit)

Syllabus/ Topics

- » Using Microsoft excel for the sake of financial management
 - ↳ Examining cashflows
 - ↳ Spreadsheet development and implementation
 - ↳ VBA
- » Key Financial concepts
 - ↳ Discounted Present Value
 - ↳ Accumulated Value
 - ↳ Internal Rates of Return
- » Loan Amortisation Schedules
- » The roles and duties of Actuaries in a wide range of industries
 - ↳ Insurance
 - ↳ Superannuation
 - ↳ Banking
 - ↳ Financial and Professional services

Learning activities

Lecture (1 hour)

May consist of Seminar style classes, where guest speakers come in to present about actuaries in the workplace.

Computer Laboratory (2 hours)

Weekly computer workshops, focusing on Microsoft Excel, learning how to apply financial functions and statistical tools.

Industry knowledge

Computer languages and software

Languages: VBA

Software: Excel

Likely required to use VBA to automate simple processes or undertake Monte Carlo simulations.

Likely will be required to use excel to learn basic functions and their arguments (NPV, VLOOKUP, IRR etc...) and apply them to solve loan schedules and other.

Links to other units

This unit will help set core actuarial understanding for future units.

Useful knowledge from previous units

[ACTL1002](#) (Introduction to Actuarial Science)

Overlap with other units commonly taken concurrently

N/A

Useful topics for future units

N/A

COMS1000 Science Communications

Unit nickname	Previous unit name
Coms	N/A
Challenge rating	Type of unit
2	Previously a compulsory (no longer offered)
	Exemption
	N/A
Information based on	Availability
Semester 2 2019	No longer offered
Prerequisites for this unit...	This unit is a prerequisite for...
Nil	Nil
Reliability of information	
This unit is being replaced by NPSC1003 which will have some similarities but is fundamentally a different unit.	
<i>Note that this unit will be changed or replaced in 2020 due to Curtin's policy decision to remove half units.</i>	
We suggest you check the published unit outlines for more information.	

Syllabus/ Topics

This unit is designed for the those who are studying a "science" degree, it improves student's ability to read and cite academic papers and co-operate with others in order to synthesise and communicate scientific information.

Assessments

Assessment name	Weighting
Background to Argument	20%
Argument	20%
Group oral task	40%

Learning activities

Workshop (2 hours)

Workshops are highly structured with designated worksheets and activities (which are not assessed), they also are the primary method through which students can receive feedback and develop a better understanding of the assessment tasks. Attendance is also essential for certain sections of the assignment. In general, however, there is a reasonable difference between the content covered in these sessions and the assignments and quizzes.

iLectures Quality

None of the above learning activities were recorded.

Learning materials

Textbook

Textbook importance: unnecessary

The textbook is highly irrelevant to the unit.

List of other learning materials

- » Majority of the learning materials are provided via URL on blackboard

Usefulness of learning materials

The unit materials were adequate for the required learning

General comments

This unit provides two sets of quizzes which allow unlimited attempts. In general, it is reasonably easy to score well in the first half of the unit. As on semester 2 2019 weekly quizzes were provided with an overall weighting of 0%, although recommended to complete was not necessary to. The second half, requires far more work and is heavily dependent on the English and scientific literacy skills of the student, as well as their group and their ability to work with others. Regular work is highly recommended as both assignments (along with several others in other units in the regular tuition pattern) are due at a similar time. Particularly given the frequently underestimated time it takes to appropriately cite sources. Students for whom English is a second language may find this unit more challenging.

Industry knowledge

Computer languages and software

None.

Industry practice

This unit is moderately useful should you perform any sort of research and depending on your topic selection can help you gain a greater understanding of future trends in the insurance, superannuation or pension industries.

Links to other units

Useful knowledge from previous units

N/A

Overlap with other units commonly taken concurrently

N/A

Useful topics for future units

The scientific writing and referencing in this unit apply to those who do an industrial project (MATH3004).

ECON1000 Introductory Economics

Unit nickname	Previous unit name
Intro Econs/Econs	N/A
Challenge rating	Type of unit
1.5	Compulsory unit (substitute for ECON1001)
	Exemption
	CT7 (together with ECON2001)
Information based on	Availability
Semester 2 2018	Both Semesters
Prerequisites for this unit...	This unit is a prerequisite for...
Nil	ECON2001
	STAT3006

Reliability of information

The lecturer may change but the experience in this unit should remain fairly consistent between semesters. We suggest you check the published unit outlines for more information.

Syllabus/ Topics

- » Supply and demand
- » Elasticity
- » Economic efficiency
- » Behavioural economics
- » Introduction to macroeconomics
- » Aggregate supply and aggregate demand
- » Monetary and Fiscal Policy
- » Exchange rates

Assessments

Assessment name	Weighting
Workshop exercises	20%
Article analysis	30%
Exam	50%

Learning activities

Lecture (2 hours)

Lectures were officially two hours, once a week, but they usually ran for an hour and a half. The lectures discussed economics concepts and also made extensive use of real-life examples. The lecturer would typically ask questions during and at the end of a topic. These questions would be answered by an online platform, where students anonymously submit their answers, which the lecturer then displays on the projector to gauge student responses. These responses were not assessed. There was also a live lecture for students to watch the lecture in real time.

Tutorial (1 hour)

Tutorials were one hour each week. Students were given handouts of the questions and the tutor would go through the questions one by one, asking students to give answers. The tutor would then add any additional information to the answer if needed. Participation was highly encouraged.

iLectures Quality

Learning activities recorded: Lectures

Teaching style lent itself to being recording: Yes

iLectures were of high quality. All content that was displayed appeared clearly on the iLecture. Watching the iLecture was essentially equivalent to attending the physical lecture.

Learning materials

Textbook

Textbook reference: Hubbard, Glenn, Anne Garnett, Phil Lewis, and Anthony O'Brien, 2015. *Introductory Economics* (Custom Edition), 1st edn, Sydney, NSW: Pearson Australia.

Textbook importance: Useful

Content from lectures and tutorials, along with textbook chapter summaries were typically sufficient to understand concepts, hence many students performed well without using the textbook.

List of other learning materials

- » Lecture slides (powerpoint)
- » Textbook
- » Chapter summaries of textbook (pdf)
- » ED – an online forum for students and teaching staff (online)
- » Past exams and partial solutions (pdf)

Usefulness of learning materials

Lectures and tutorials covered concepts quite well. The difficulty of past exams reflected the difficulty of the exam.

General comments

This was not a difficult unit overall, especially for students who studied Economics in high school (although in that situation you are better off choosing [ECON1001](#)). Choosing this pathway does mean you sacrifice a second year optional unit in favour of [ECON2001](#). It is however a far easier way of obtaining CT7 exemption.

Industry knowledge

Computer languages and software

None.

Industry practice

A basic understanding of economics is always a useful skill to have in the business world. It aids in talking to those who have different roles to you in a firm, it can provide a common ground through which you can communicate.

Links to other units

Useful knowledge from previous units

Students will find knowledge of Economics in high school to be very beneficial.

Overlap with other units commonly taken concurrently

N/A

Useful topics for future units

Students that take this unit will have to take [ECON2001](#) (Macroeconomic Principles) in Year 2, Semester 2 as an elective unit in order to gain a full CT7 exemption. The macroeconomic concepts taught in this unit are helpful for this. Some topics in economics are useful later in [STAT3006](#).

MATH1016 Calculus 1

Unit nickname	Previous unit name
Calc 1	N/A
Challenge rating	Type of unit
1.5	Compulsory unit
	Exemption
	N/A
Information based on	Availability
Semester 2 2019 (same as Semester 2 2018)	Both Semesters
Prerequisites for this unit...	This unit is a prerequisite for...
Nil	STAT2001
	MATH2004
	MATH2005
	MATH2009
	MATH2010
	MATH2015

Reliability of information

The experience in this unit should remain reasonably consistent between semesters regardless of lecturer.

We suggest you check the [published unit outlines](#) for more information.

Syllabus/ Topics

- » Functions
- » Differentiation techniques
- » Applications of differentiation
- » Integration techniques
- » Application of techniques
- » Multivariable calculus
- » First order differential equations
- » Second order differential equations
- » Limits
- » Convergence tests for series
- » Power series

Assessments

Assessment name	Weighting
Workshop assessment	15%
Quizzes	10%
Mid-semester test	25%
Final examination	50%

Learning activities

Lecture (2 hours)

Lectures were run near identically to those in [Linear Algebra 1](#). The lecturer would print out lecture slides for students to annotate. During the lecture, explanations were followed by some examples that the lecturer would work through to apply the concept that was just explained. After each topic in the lecture (there were

often a few), there would be some exercises where students were given some time to attempt questions, then the lecturer would go through them. The lectures were a bit fast-paced at times so it was important to pay attention. All notes and answers to examples were annotated on to the lecture slides. This annotated version was uploaded after the lecture.

Workshop (1 hour)

Depending on your tutor, you worked through them with the other people on your table either on the board or in your books. The tutors would frequently roam to see how you were progressing and if your answers were correct. Answers to the workshop questions were available at the end of the week

iLectures Quality

Learning activities recorded: Lectures

Teaching style lent itself to being recording: yes

Everything that was written by the lecturer during the lecture was visible on the iLecture. The audio recording was clear so everything the lecturer said was audible on the iLectures. The recordings were also paused whenever the class was given a break. Overall, everything that the lecturer said or wrote was all captured on the iLecture. Aside from some interactivity, they were essentially the same as being there

Learning materials

Textbook

No textbook was prescribed for this unit.

List of other learning materials

- » Lecture slides – blank and annotated (pdf)
- » Extra practice problems – blank and solutions (pdf)
- » Workshop questions – blank and solutions (pdf)
- » Past workshop tests – blank and solutions (pdf)
- » Past exams – blank and solutions (pdf)

Usefulness of learning materials

Examples and exercises from the lectures, along with extra practice problems and workshops questions covered the all the unit's concepts thoroughly. Past test and exam papers were also very helpful in the lead up to tests and the exam.

General comments

Not a difficult unit at all, but it can become difficult if you fall too far behind.

Industry knowledge

Computer languages and software

None.

Industry practice

None.

Links to other units

Useful knowledge from previous units

Knowledge of calculus from Maths Specialist and Maths Methods from high school is very helpful in this unit.

Overlap with other units commonly taken concurrently

N/A

Useful topics for future units

Differential equations in this unit are expanded on in [MATH2009](#).

Power series are important in [STAT2001](#), [STAT3001](#) and [STAT3002](#)

MATH1018 Advanced Mathematics 2

Unit nickname

N/A

Previous unit name

Accelerated maths 2 (2018)

Challenge rating Type of unit

3.5

Compulsory

Exemption

N/A

Information based on

Semester 2 2019 (same as Semester 2 2018)

Availability

Semester 2 only

Prerequisites for this unit...

[MATH1017](#)

This unit is a prerequisite for...

[STAT2001](#)[MATH2004](#)[MATH2005](#)[MATH2009](#)[MATH2010](#)[MATH2015](#)

Reliability of information

The future of this unit is heavily dependent on whether the current lecturer continues to take this unit. The lecturer teaches this unit in a very consistent manner from year to year. However, should the lecturer change, the unit will undergo significant adjustments.

We suggest you check the published unit outlines for more information. We suggest you check the [published unit outlines](#) for more information.

Syllabus/ Topics

- » Linear Algebra including rank nullity theorem
- » First and second order Differential Equations
- » Group Theory and Vector Fields and Spaces
- » Frame Fields and Directional derivatives
- » Multivariable Calculus
- » Sequences and Series
- » Limits

Assessments

Assessment name	Weighting
Quizzes	35%
Mid-semester test.	15%
Examination	50%

Learning activities

Lecture (2 hours)

Content is taught through heavy usage of writing on the board and frequent discussion with the lecturer. Complex examples are often used to provide a concrete and foundational understanding of the topics. It is highly recommended that you attend.

Tutorial (1 hour)

N/A

Workshop (1 hour)

Workshops are often run identically to lectures aside from workshop tests which are typically relatively easy in comparison to other assessments and are often guided by the lecturer. They also provide an opportunity for students to gain bonus marks.

iLectures Quality

Learning activities recorded: lecture

Teaching style lent itself to being recording: somewhat

There are times where the iLecture itself is bad in quality. the lecturer walks around the classroom while delivering the material, which makes the camera to follow the lecturer and neglect the content written on the board.

Learning materials

Textbook

Textbook reference: [Calculus, 7th Edition](#) by Stewart, J.

Textbook importance: useful

Calculus by James Stewart can be useful as a supplementary resource and provides additional practice questions with answers. It is far from essential, however, and high performing students will not require it. As a matter of fact, the lecturer will recommend Calculus by Michael Spivak.

List of other learning materials

- » Workshop questions are provided on a regular basis, although aside from the more difficult questions these are not usually reviewed in class.
- » Notes are provided occasionally throughout the course on specific topics.
- » There are a few suggested textbooks such as Calculus by James Stewart.

Usefulness of learning materials

Due to the density of the lecture material, the workshop questions provided are a good opportunity to ensure a comprehensive understanding of the topic. They often raise applications of the topics themselves. Further on, the workshop materials also serve as good exam/test drilling materials as you are able to find some questions in the exam/test derived from the workshop questions themselves

Industry knowledge

Computer languages and software

None.

Industry practice

None.

Links to other units

Useful knowledge from previous units

Linear algebra, limits, calculus from [MATH1017](#) (Accelerated Mathematics 1) are all relevant.

Overlap with other units commonly taken concurrently

Directional derivatives, volume and area calculations through calculus techniques and some differential equations feature again in [MATH2009](#) (Calculus 2).

Useful topics for future units

Differential equations and directional derivatives are important in [MATH2009](#) (Calculus 2) and integrating factor type differential equations are used in [STAT3005](#).

STAT1000 Regression and non-Parametric Inference

Unit nickname	Previous unit name
Regression	N/A
Challenge rating	Type of unit
3	Compulsory
	Exemption
	CT3 → CS1
Information based on	Availability
Semester 2 2019 (edited from Semester 2 2019)	Both semesters
Prerequisites for this unit...	This unit is a prerequisite for...
STAT1002	STAT2003
Reliability of information	
We suggest you check the published unit outlines for more information.	

Syllabus/ Topics

- » Non-parametric inference
 - ↳ Sign Test
 - ↳ Signed-rank Test
 - ↳ Rank-Sum Test
 - ↳ Kruskal-Wallace Test
- » Regression
 - ↳ Simple linear regression
 - ↳ Multiple linear regression
 - ↳ Assessing model adequacy
 - ↳ Transformations
 - ↳ Variable selection methods
 - ↳ Q-Q Plots

Assessments

Assessment name	Weighting
Project	50%
Test	50%

The project consisted of a theory test worth 30% and the practical making up the other 20%.

Learning activities

Lecture (2 hours)

Lecturer made an effort to engage with students and provide examples. White board usage was frequent in explaining questions. Slides with examples from R were also common.

Tutorial (1 hour)

N/A

Workshop (1 hour)

The workshop involves a high degree usage of R and RStudio. But for the tutor from this semester, it expects students to have a high degree of understanding of R and there is a steep learning curve between [STAT1002](#) (or equivalently [STAT1005](#) in the new curriculum) and this unit.

iLectures Quality

Learning activities recorded: lecture

Teaching style lent itself to being recording: no

The Lecturer frequently moved away from the microphone to write examples on the whiteboard which are not recorded for the iLecture. Sound quality is frequently patchy.

Learning materials

Textbook

No textbook was prescribed for this unit.

List of other learning materials

- » Lab questions and solutions were provided in R Markdown, these have great extra features to improve even working code.
- » Lecture slides and supplementary R code and datasets for provided examples

Usefulness of learning materials

Lab exercises were also very useful as R is the main focus of the lecture material. The lecture slides were sufficient to learn content without the aid of any external materials.

General comments

The assignment in this unit is quite difficult and time consuming, in the regular tuition pattern it occurs at the same time as other large assignments (although it is easily the most work) and early preparation is advised. The lecturer does provide advice and clarification computer labs however so make sure you attend. Some also found tests and exam in this unit challenging. Don't take studying for them lightly.

Industry knowledge

Languages: R

Industry practice

This is an extremely applicable unit for real world data analysis, particularly the R component. The assignment is also a great talking point in data science interviews as it is probably the largest dataset first year students have used within the course curriculum.

Links to other units

Useful knowledge from previous units

Hypothesis testing and a basic understanding of some of the distributions from Statistical Data Analysis ([STAT1002](#)) and Statistical Probability ([STAT1001](#)) are required. Basic interpretation of simple linear regression models is also covered in [STAT1002](#).

Overlap with other units commonly taken concurrently

N/A

Useful topics for future units

Regression is used again when looking at CAPM and multifactor models in [STAT3006](#).

This unit has some overlap with the optional unit, [STAT1003](#) its usage of R. As a result, students who take this optional unit in semester 1 of second year will typically know much of the content already from taking [STAT1000](#) in semester 2 of first year.

STAT1006 Regression and Nonparametric Inference

Unit nickname	Previous unit name	
N/A	N/A	
Challenge rating	Type of unit	Exemption
?	New compulsory unit in 2020	CS1
Information based on	Availability	
This is a new unit as at the date of publishing, we will endeavour to review it once it has been delivered for the first time	Semester 2 only	
Prerequisites for this unit...	This unit is a prerequisite for...	
Nil	STAT2003	
Reliability of information		
This is a new unit at the time of release of this document. We have provided as much information as we can find without input from those who took the unit. This unit is expected to be extremely similar to the previous STAT1000 unit. The main difference is that this unit is a full unit whereas STAT1000 was a half unit. The content is likely to be either identical or very similar with changes to the assessments expected to occur. We suggest you check the published unit outlines for more information.		

Syllabus/ Topics

- » Non-parametric hypothesis testing
 - ↳ Sign Test
 - ↳ Signed-rank Test
 - ↳ Rank-Sum Test
 - ↳ Kruskal-Wallis Test
- » Regression
 - ↳ Simple linear regression
 - ↳ Multiple linear regression
 - ↳ Assessing model adequacy
 - ↳ Transformations
 - ↳ Variable selection methods
 - ↳ Q-Q Plots

Learning activities

Lecture (2 hours)

Workshop (1 hour)

Industry knowledge

Computer languages and software

Languages: R

Software: RStudio

Links to other units

Useful knowledge from previous units

Hypothesis testing and some of the statistical distributions from [STAT1005](#) is expected to prove useful in this unit.

Overlap with other units commonly taken concurrently

N/A

Useful topics for future units

Regression is used again when looking at CAPM and multifactor models in [STAT3006](#).

Second Year Units

Semester 1**FNCE2000 Introduction to Finance Principles**

Unit nickname		Previous unit name
Finance		N/A
Challenge rating	Type of unit	Exemption
1	Compulsory unit	CT2
Information based on		Availability
Semester 1 2019 (edited from Semester 1 2018)		Both Semesters
Prerequisites for this unit...		This unit is a prerequisite for...
Nil		STAT3006 Investment Science 1 INVE3000 Introduction to Derivative Securities INVE3001 Portfolio Management

Reliability of information

We suggest you check the [published unit outlines](#) for more information.

Syllabus/ Topics

- » Basic financial theory such as business structures and management-shareholder interaction
- » Discounting and accumulating cashflows
- » Project appraisal criteria such as NPV, IRR and DPP
- » Basic annuity calculations
- » Financial instruments such as bonds, shares and derivations and corresponding simplified calculations

Assessments

Assessment name	Weighting
Mid-Semester Test	25%
Assignment	25%
Final Examination	50%

Learning activities**Lecture (2 hours)**

Lectures primarily consisted of the lecturer reading theory and extensive examples from the lecture slides, due to the large audience the lecturer could not easily engage directly with the students but was clear in their explanation.

Tutorial (1 hour)

The tutorials were more dynamic and dependent on the tutor. They tried to give practical advice based on their experience and run through solutions to each week's tutorial questions. Attendance was helpful for some, but many performed adequately without attending.

iLectures Quality

iLecture quality was reasonably clear, and in conjunction with provided slides could be used to understand the content. As this was a large unit with external (online-only) students, an effort had to be made to this end.

Learning activities recorded: Lectures

Teaching style lent itself to being recording: Yes

Tutorials are not recorded

Learning materials

Textbook

Textbook reference: Ross, Stephen. A., Michael Drew, Adam Walk, Randolph W. Westerfield and Bradford D. Jordan. 2017.

Fundamentals of Corporate Finance 7th Edition. Sydney: McGraw-Hill Education.

<https://www.coop.com.au/fundamentals-of-corporate-finance-connect-card/9781743762967>

Textbook importance:

List of other learning materials

- » Tutorial questions and solutions
- » Lecture slides
- » Prescribed textbook and recommended questions and chapters corresponding to each topic

Usefulness of learning materials

The textbook was unnecessary to do well in this unit. The materials provided on Blackboard were more than sufficient.

The lecture slides and tutorial questions and solutions were all that were required to understanding the content within this unit. They were thorough and included many examples.

General comments

Financial calculators are not, required for completion of this unit. And all annuity related, solving functionality will not be directly assessed within the unit to ensure all students have an equal standing. Using your standard scientific calculator will serve you well enough.

This unit should cause actuarial students absolutely no trouble. It is run by the business school which means it requires a far lower level of mathematical rigour in comparison to many of the other units students would have taken previously.

Industry knowledge

Project appraisal criteria and some financial theory is useful for understanding and discussing business management. The content covered in this unit, however, is very basic.

Links to other units

Useful knowledge from previous units

Project appraisal criteria and discounting is useful from Accounting – The Language of Business (ACCT1000). Some annuity information from Principles of Insurance and Superannuation ([ACTL1001](#)) may also be useful.

Overlap with other units commonly taken concurrently

N/A

Useful topics for future units

Theory of Interest ([MATH2004](#)) re-covers and extends much of the material provided, although retaining an understanding of bonds, basic annuities and project appraisal criteria does ease the difficulty of this unit. Derivative securities are covered again in [MATH2004](#) and [STAT3007](#).

MATH2009 Calculus 2

Unit nickname	Previous unit name
Calc 2	Advance Calculus (2016 and prior)
Challenge rating	Type of unit
2	Compulsory unit
	Exemption
	N/A
Information based on	Availability
Semester 1 2019 (same as Semester 1 2018)	Semester 1 only
Prerequisites for this unit...	This unit is a prerequisite for...
MATH1016 or MATH1018	INVE3000
	INVE3001
	MATH3000
	MATH3001

Reliability of information

We suggest you check the [published unit outlines](#) for more information.

Syllabus/ Topics

- » Directional Derivatives
- » Volume and Area Calculations using double and triple integrals
- » Line Integrals and integration across vector fields
- » First and Second Order Differential Equations and Partial Differential Equations (PDEs)
- » Fourier Series

Assessments

Assessment name	Weighting
Assignment 1	15%
Assignment 1	15%
Mid-Semester Test	20%
Final Examination	50%

Learning activities

Lecture (2 hours)

The lecturer works through dense notes and examples to a large audience. Many students found the lecturer's accent in lectures to be difficult to understand. The notes and examples were often similar to those found in Calculus 7th ed. By James Stewart.

Tutorial (1 hour)

The tutorials are far more dynamic (although tutors still progress through the provided questions). Answers to the tutorial questions were only provided during the tutorials or after the weeks' completion. You were expected to complete the tutorial questions in advance.

Attendance was not necessary.

Workshop (1 hour)

Workshops were essentially an opportunity for the lecturer to cover any content that was unfinished during that week's lecture. They were taught in the same format and method.

iLectures Quality

The iLectures, in conjunction with the notes provided and a significant amount of resources online, were sufficient to understand this unit. Many examples were worked through on the screen.

Learning activities recorded: Lectures

Teaching style lent itself to being recording: yes

Learning materials

Textbook

Calculus 7th ed. By James Stewart

Textbook importance: unnecessary

List of other learning materials

- » Weekly Lecture Notes
- » Weekly tutorial questions (and solutions)

Usefulness of learning materials

The lecture notes were sufficient although often brief and difficult to understand without further exploring topics. One of the authors found this website particularly useful: <http://tutorial.math.lamar.edu/Classes/CalcII/CalcII.aspx>. Note however that understanding theory was not particularly essential and simply knowing the process to obtain the solution could be learned simply from the notes.

The tutorial questions and the examples in the notes made for good practice as they were of a similar level to assessments. Some were in fact more difficult than would be encountered in an exam.

General comments

Many students are able to perform well in this unit without understanding its theory, as many of the questions could be completed by “pattern-matching” with the relevant algorithm. Without practice, however, many students can also have a false impression of their ability. The fact that it is a “hack” unit does not mean you should get complacent.

If visited in his office the lecturer can be very accommodating and helpful and can also be more easily understood.

Industry knowledge

None.

Links to other units

Useful knowledge from previous units

Some first order and second order DEs carry over from [MATH1016](#) Calculus 1 and [MATH1018](#) Accelerated Mathematics 2, which also teaches directional derivatives. [STAT1001](#) Statistical Probability also provided prior exposure to double integrals, which are further explored in [STAT2001](#) Mathematical Statistics.

Overlap with other units commonly taken concurrently

N/A

Useful topics for future units

Lagrange multipliers are used in [STAT3006](#) (Investment Science 1).

Variation of parameters as a technique for solving ODEs is analogous to the technique used for solving the Ornstein-Uhlenbeck SDE which is encountered in both Investment Science 1 and 2 ([STAT3006](#) and [STAT3007](#)), along with Accelerated/Advanced Mathematics 2 ([MATH1018](#)).

STAT2001 Mathematical Statistics

Unit nickname	Previous unit name
Maths Stats	N/A
Challenge rating	Type of unit
3	Compulsory unit
	Exemption
	CT3
Information based on	Availability
Semester 1 2019 (edited from Semester 1 2018)	Semester 1 only
Prerequisites for this unit...	This unit is a prerequisite for...
MATH1015 or MATH1017	STAT3005
MATH1016 or MATH1018	MATH3005
STAT1001	STAT3001
	STAT3002
	STAT3000
Reliability of information	
We suggest you check the published unit outlines for more information.	

Syllabus/ Topics

- » Multivariate distribution
- » Expectation, correlation and covariance
- » Transformation of random variable
- » Conditional distributions and expectation
- » Generating functions
- » Order statistics and functions of random variables
- » Central limit theorem
- » Methods of estimation and properties of estimators

Assessments

Assessment name	Weighting
Scaffolded assessment with feedback points	20%
Mid-term test	20%
E-test	10%
Final Examination	50%

Learning activities

Lecture (2 hours)

The lecturer utilised slides, frequent examples and working through an overhead projector to teach concepts, often attempting to engage the audience with questions.

Overall, most topics were explained quite clearly and thoroughly. However, the lecturer did move quickly through some of the complex concepts due to the large breadth of topics.

Tutorial (1 hour)

The questions in the workshops were often more basic than those in the tutorials, and since these sessions encompassed far more students, individuals had less opportunity to ask the lecturer questions.

Workshop (1 hour)

The questions in the workshops were often more basic than those in the tutorials, and since these sessions encompassed far more students, individuals had less opportunity to ask the lecturer questions.

iLectures Quality

2019: The iLectures were recorded well.

2018: The iLecture quality has previously been extremely variable, many times the lecture was not recorded.

microphone usage and camera movement, it was also be difficult to interpret as times.

The lecturer for this unit has more recently adopted a different style utilising an overhead projector to record notes and mathematical working to assist with this.

Learning activities recorded: Lectures

Teaching style lent itself to being recording: Yes

Learning materials

Textbook

Textbook reference: Jay L., D. & Kenneth N., B. (2012) Modern Mathematical Statistics with Applications. 2. edition. New York, NY :, Springer New York.

Textbook importance: useful

Supplementary Resources

- » George., C. & Roger L., B. (2002) Statistical inference /. 2nd ed. Australia :, Thomson Learning.
- » Morris H., D. & Mark J., S. (2002) Probability and statistics /. 3rd ed. Boston :, Addison-Wesley.
- » Irwin, M. & Irwin, M. (2004) John E. Freund's mathematical statistics with applications. 7th ed. /. Upper Saddle River, NJ :, Prentice Hall.
- » Robert V., H. & Allen T., C. (2013) Introduction to mathematical statistics /. 7th ed. Boston :, Pearson.
- » Richard J., L. & Morris L., M. (2012) An introduction to mathematical statistics and its applications /. 5th ed. Boston :, Prentice Hall.
- » John A., R. (2007) Mathematical statistics and data analysis /. 3rd ed. Belmont, Calif. :, Thomson.
- » Ronald E., W. & Keying, Y. (2016) Probability & statistics for engineers & scientists /. Ninth edition. Global edition. Harlow , Essex, England :, Pearson Education Limited.

List of other learning materials

- » Set Notes which include tutorial questions and answers
- » Workshop questions
- » Slides which contain formulae etc

Usefulness of learning materials

The unit outline recommends various textbooks (this year's unit outline includes 9 different texts), some of which are accessible online through the library. Many of these only include notes on a single topic and often provide far more detail than is required in the unit.

The set notes are easily the most useful resource in the unit, often providing a more thorough explanation of the lecture topics and then questions to help compound this knowledge. Workshop questions are useful to ensure a certain foundation, as there was often little time in assessments to operate from first principles. The slides can often be incoherent when not accompanied by explanations by the lecturer.

General comments

The lecturer was open to students dropping by and asking for help.

The tutorials were an opportunity to try attempt questions and receive feedback and assistance from the lecturer, they were not however, designed to teach the absolute basics.

The real differentiator in this unit is often time, students who are not completely familiar with concepts will often be unable to complete timed assessments. It is therefore very important to practice a high volume of questions in preparation for assessments.

Industry knowledge

Computer languages and software

2019: In the assignment, both empirical and analytic methods were applied to and insurance modelling problem. A similar example of a question was not covered in class which some students found challenging.

2018: The assignment was similar to practical statistical inference, however, it focusses on the theory behind such concepts rather than effective and pragmatic industry strategies and complications (as this was not actually the point of the unit).

Languages: R

Software: Excel, Rstudio

The Assignment in 2019 was an open-ended style question that required the use of R.

Industry practice

None

Links to other units

Useful knowledge from previous units

[STAT1001](#) provides elementary knowledge that this unit builds on. Note that the important topics from [STAT1001](#) are revised at the beginning of this unit but it is handy to have some recollection of them.

Overlap with other units commonly taken concurrently

N/A

Useful topics for future units

Knowledge from this unit is fundamental for many later units. Almost every topic (with the exception of order statistics) from this unit is used again in third year. It is advised that you keep your notes for this unit as they will come in handy later.

Knowledge of Maximum likelihood estimations and covariance is important for [STAT3005](#).

MLE is used heavily and expanded upon in [STAT3001](#) for Bayesian statistics. Many of the distributions from this unit are also used extensively throughout the unit.

Moment generating functions, common distributions, convolutions and methods of estimation are all used in [STAT3002](#).

An understanding of expectation of random variables is important in [MATH3006](#) (Life Contingencies 1). An understanding of joint probability comes in handy when studying [MATH3007](#) (Life Contingencies 2).

Semester 2

ECON1001 Actuarial Economics

Unit nickname		Previous unit name
Act econs		Act econs (2019)
Challenge rating	Type of unit	Exemption
2.5	Compulsory Unit Previously ECON1000 could be taken instead but as of 2020 this is no longer an option.	CT7 -> CB2
Information based on		Availability
Semester 2 2019 Same as Semester 2 2018		Semester 2 only
Prerequisites for this unit...		This unit is a prerequisite for...
Nil *Although the unit outline suggests that students should've done high school economics to take this unit		STAT3006
Reliability of information		
We suggest you check the published unit outlines for more information.		

Syllabus/ Topics

- » Microeconomics
 - ↳ Introduction, Supply & Demand, Elasticity
 - ↳ Consumer Demand & Uncertainty
 - ↳ Competition
 - ↳ Product, Marketing & Advertising; Growth & Pricing Strategies
- » Macroeconomics
 - ↳ Government Intervention in Markets
- » Government and the Firm
 - ↳ Supply Side Policy
 - ↳ International Trade, Balance of Payments and Exchange Rates
 - ↳ The Macroeconomic Environment, Money and Interest Rates
 - ↳ Business Activity, Unemployment & Inflation, Demand side Macroeconomic Policy

Assessments

Assessment name	Weighting
Test 1	15%
Test 2	15%
Ongoing Tutorial Exercises	20%
Final Exam	50%

Learning activities

Lecture (2 hours)

The lecturer primarily used long PowerPoint presentations which included real world examples. Given the level of rote learning throughout the unit, the lecturer spent long periods reading off information from their slides and then providing insight from there.

Tutorial (1 hour)

Quizzes consisted of 5 multiple choice questions and were done under test conditions. Questions are given as tutorial exercises which is served as revision.

Workshop (1 hour)

Workshop involves going through practice questions at which some can be founded from the CT7 notes, the answer of the questions nicely summarizes the main point of each chapter. Further on, there is a tendency for some practice questions to turn up in the exam.

iLectures Quality

Learning activities recorded: lecture

Teaching style lent itself to being recording: yes

The lecturer could be adequately understood through the iletures

Learning materials

Textbooks

Textbook reference:

Option 1: [CT7/CB2 notes\(2018\)](#) by The Actuarial Education Company(UK)

Textbook importance: useful

If you were to study high school economics before, you may find the lecture slides themselves to be sufficient in order to acquire the exemption. But from the perspective of a student who has not studied high school economics, the CT7/CB2 notes provides high utility as it provides useful practice questions to prepare oneself from exam or tests, but the content of the notes itself are redundant as the lecture slides are based off the notes. Despite the unit recommends one to acquire the 2018 version of the notes, older versions as old as 2013 is still coherent to the current course content. Lastly, there is a tendency for the notes itself to provide examples based on the UK economy as the notes itself are published in the UK.

Option 2: [Economics for Business](#). 7th edition By J Sloman

Textbook importance: unnecessary

List of other learning materials

- » Lecture Slides
- » Tutorial Questions

Usefulness of learning materials

The lecture slides were very thorough and addressed all assessable material in great detail. They were also quite long

General comments

Although useful to help with the extensive rote learning, high school economics is not essential for the completion of this unit. Assessments are overall quite manageable with preparation. Students who have not done economics before may want the textbook or the past lecture notes in order to familiarise themselves before the unit begins. The first two weeks are particularly content heavy for beginners but do not be scared off by this. If you are seriously worried about workload in a semester then you might want to select [ECON1000](#) instead. Keep in mind however that capable students should be fine regardless of their background in economics.

Industry knowledge

Computer languages and software

None.

Industry practice

A basic understanding of economics is always a useful skill to have in the real world. It aids in talking to those who have different roles to you in a firm, and it can provide a common ground through which you can communicate.

Links to other units

Useful knowledge from previous units

This unit will be easier if students had done economics in high school.

Overlap with other units commonly taken concurrently

N/A

Useful topics for future units

A number of economic concepts such as utility theory will be encountered again in [STAT3006](#)

ECON2001 Macroeconomic Principles

Unit nickname	Previous unit name
Macro	N/A
Challenge rating	Type of unit
1	Optional Unit (compulsory if ECON1000 was taken)
Exemption	CT7
Information based on	Availability
Semester 2 2019	Both semesters 1 and 2
Same as Semester 2 2018	
Prerequisites for this unit...	This unit is a prerequisite for...
ECON1000	Nil
Reliability of information	
We suggest you check the published unit outlines for more information.	

Syllabus/ Topics

- » The policy and practice of macroeconomics
- » Business cycle and the IS curve
- » Monetary policy and aggregate demand
- » Aggregate supply and the Phillips Curve
- » Aggregate demand and supply model
- » Macroeconomic policy and the role of expectations
- » Fiscal Policy
- » Exchange rates and international economic policy

Assessments

Assessment name	Weighting
Tutorial Presentation	20%
Assignment	30%
Final examination	50%

Learning activities

Lecture (2 hours)

The lecturer would present information on PowerPoint slides and explain some points in detail. The lectures were based on pure explanation and clarification by the lecturer without class interaction.

Tutorial (1 hour)

Unfortunately, the individual who wrote this guide cannot provide information on this activity as they were enrolled in the unit online.

iLectures Quality

As this unit had fully online students enrolled, the iLectures had to be (and were) of a high quality.

Learning activities recorded: Lecture

Teaching style lent itself to being recording: Yes

Learning materials

Textbook

Textbook reference: Mishkin, Frederic S. (2015). Macroeconomics: Policy and Practice, 2nd Edition, Global Edition, Pearson Education.

Textbook importance: Unnecessary

List of other learning materials

- » Lecture Slides
- » Workshop Questions (All provided in week one via pdf)
- » Discussion questions for further extension

Usefulness of learning materials

All information needed for tests and exams is provided in the lecture slides and explained further by the lecturer.

General comments

Assessments were straight forward, the lecturer provided everything required to prepare for exam questions during the revision lectures.

Assessments were made easier by enrolling into this unit online. Mid-semester tests were done via blackboard any time in the week if enrolled online and online students could submit the presentation as a video rather than present in the workshops. Some students were forced to enrol online anyway due to all internal spots being taken.

Industry knowledge

Computer languages and software

Although the level is very basic in this unit, knowledge of market equilibrium is always useful in the business world.

Links to other units

Useful knowledge from previous units

Exchange rates and fiscal policy from [ECON1000](#) is useful for this unit.

Overlap with other units commonly taken concurrently

None.

Useful topics for future units

Some topics in economics are useful later in [STAT3006](#).

MATH2004 Theory of Interest

Unit nickname	Previous unit name	
TOI (pronounced like "toy")	N/A	
Challenge rating	Type of unit	Exemption
4	Compulsory unit	CT1
Information based on	Availability	
Semester 2 2019 (edited from Semester 2 2018)	Semester 2 only	
Prerequisites for this unit...	This unit is a prerequisite for...	
MATH1015 or MATH1017	MATH3005	
MATH1016 or MATH1018	MATH3006	
	STAT3006	

Reliability of information

The lecturer for this unit is expected to change in the next offering but the unit itself should remain consistent.

We suggest you check the [published unit outlines](#) for more information.

Syllabus/ Topics

- » Theory of interest rates
- » Annuities
- » Equations of Value
- » Loan Schedules
- » Project Appraisal
- » Compound Interest Problems
- » Arbitrage and Forward Contracts
- » Term Structure of Interest Rates
- » Stochastic Interest Rate Models

Assessments

Assessment name	Weighting
Test	10%
Oral Presentation	10%
Tutorial Exercises	10%
Final Examination	70%

Learning activities

Lecture (2 hours)

The lecture notes were presented using handwritten notes that were projected onto the screen using a camera extracted from the learning materials.

Tutorial (1 hour)

Topics can be included before they are taught, with minimal guidance from the tutor. This means pre-reading of lecture topics beforehand is highly recommended. Submission occurs in the following week as a hardcopy in designated groups.

Workshop (1 hour)

2018/19: The workshops were mainly dedicated to working on the group presentation and involved other things such as going over the test and exam revision once the presentations had been delivered.

2017: Workshops used the same materials and only differed in the sense that workshops were only one hour and focused mainly on examples.

iLectures Quality

Learning activities recorded: Lecture

Teaching style lent itself to being recording: Yes

The method of projecting the handwritten notes onto the screen was captured well on the iLecture for both workshops and lectures. Audio was clear.

Textbook

Textbook reference: Course Notes for Subject CT1 from the Institute of Actuaries, published by the ActEd Company

Textbook importance: useful

While the lecture notes were more than sufficient to perform well in this unit, using the textbook may prove useful as an additional resource for those who like to understand concepts more deeply.

List of other learning materials

- » Lecture notes with exercises.
- » Tutorial questions.

Usefulness of learning materials

The lecture notes were a very useful resource and cover everything you needed to know. The tutorial questions were at a challenging enough level to prepare you for tests.

General comments

This unit has a reasonably high workload compared to units encountered previously in the degree. Understanding the foundational topics in the first 4 weeks is key to doing well.

You will see reward for effort if you study in this unit, practice will make perfect.

The presentation assessment in this unit was a group project. The best way to prepare for the test and exam in this unit is by doing practice questions (of which there are plenty).

Along with [STAT3005](#), this unit is the first full-on actuarial unit in the degree. Your performance in this unit is a fairly good indicator of how you will fare in third year (although most students marks will still drop to some extent in third year).

Industry knowledge

The assignment requires previous knowledge of excel, it was a good project to practice these skills.

Links to other units

Understanding of interest rates, annuities, bonds and derivative securities from [FNCE2000](#) are useful in this unit. However, Theory of Interest takes a far more mathematical and rigorous approach establishing a more consistent set of conventions and (actuarial) notation. In Theory of interest, you will also learn the derivation of results which are simply given without proof in [FNCE2000](#) (although many actuarial students see fit to derive these results for themselves regardless).

Actuarial notation for certain annuities was briefly covered in [ACTL1001](#).

Basic calculus and the ability to solve a set of simultaneous equations are used, however they are not particularly difficult concepts to grasp.

Knowledge of the log normal distribution and moments of random variables from previous statistics (particularly Mathematical Statistics) units are useful for stochastic interest models.

Overlap with other units commonly taken concurrently

Excel knowledge learnt in [MATH2005](#) was useful for the assignment in this unit, particularly knowledge about user forms.

Useful topics for future units

All of the notation and foundational concepts covered in the first 4 weeks of this unit also form the (assumed and not retaught) basis of [MATH3006](#) (Life Contingencies 1) in which these concepts are extended to include a probabilistic allowance for mortality in life insurance contracts.

The general theory of interest rates, in particular the concept of the force of interest is useful in [STAT3006](#) (Investment Science 1).

MATH2005 Practical Mathematical Financial Modelling

Unit nickname	Previous unit name
PMFM	N/A
Challenge rating	Type of unit
2	Compulsory unit
	Exemption
	N/A
Information based on	Availability
Semester 2 2019 (edited from Semester 2 2017)	Semester 2 only
Prerequisites for this unit...	This unit is a prerequisite for...
MATH1015 or MATH1017 MATH1016 or MATH1018	Nil
Reliability of information	
The experience in this unit is unlikely to change significantly. MS access has been removed from the unit. We suggest you check the published unit outlines for more information.	

Syllabus/ Topics

- » Review and introduction to IT usage in actuarial science and finance
- » Concepts of modelling and programming
- » Introduction to practical actuarial and financial applications
- » MS Excel spreadsheet
- » Simulation using Excel
- » Charts, PivotCharts and PivotTables
- » Automation using macros
- » VBA and user forms

Assessments

Assessment name	Weighting
Assignment	35%
Test	25%
Final Examination	40%

Learning activities

Computer Lab

The computer lab was meant to go for 3 hours straight but often finished early. Content was presented through an explanation and demonstration by the lecturer, we then completed exercises ourselves with assistance from the lecturer if needed. As the venue (314.217) did not facilitate recording, attendance was reasonably important. You could learn on your own from the material provided outside the computer lab but the opportunity to ask questions and learn with peers was quite valuable. As work for the labs also needed to be submitted in a portfolio at the end of the unit, it was quite important to attend.

Learning materials

Textbook

No textbook was prescribed for this unit.

General Comments

2019: The experience for this unit was more or less the same as described below, however the MS access component of the unit was removed in the 2019 version of this unit.

2017: This was a reasonably straightforward that helped you gain some useful skills. The assessments during semester were reasonably straightforward, however the exam was slightly more difficult due to time pressure. The MS access question in the exam was what most students found the most challenging.

Industry knowledge

2019: The MS access component has since been removed from the unit. As well as the excel and VBA knowledge, this unit introduces students to some good spreadsheeting practises such as storyboarding which are useful skills to have when planning out your approach to solving a problem using computer software.

2017: This unit contained a lot of excel and VBA programming knowledge as well as an introduction to databases in MS access in the final two weeks. This unit was a great opportunity to increase your excel skills, no matter what your pre-existing level of excel knowledge was. This unit also provided some additional information on actuarial applications of computing.

Useful knowledge from previous units

Excel knowledge from [ACTL1000](#) was useful for this unit. There was some overlap and repetition of the basics as well expansion of skills learned in [ACTL1000](#).

The numerical methods (e.g. Newton-Raphson) in this unit are covered in greater detail in optional unit mathematical computing.

Knowledge of mathematics and statistics from earlier units in the course incidentally come up in some exercises.

Overlap with other units commonly taken concurrently

N/A

Useful topics for future units

N/A

STAT3005 Stochastic Processes

Unit nickname

N/A

Previous unit name

Actuarial Statistics (2017)

Challenge rating Type of unit

3.5

Compulsory unit

Exemption

CT4

Information based on

Semester 2 2019
(Same as Semester 2 2018)

Availability

Semester 2 only

Prerequisites for this unit...

[STAT2001](#)

This unit is a prerequisite for...

Nil

Reliability of information

We suggest you check the [published unit outlines](#) for more information.

Syllabus/ Topics

- » Stochastic processes
- » Markov chains
- » Two state Markov model
- » Time homogeneous Markov jump process
- » Markov jump process
- » Principles of actuarial modelling

Assessments

Assessment name	Weighting
Test 1	15%
Test 2	15%
Online etests	10%
Final Examination	60%

Learning activities

Lecture (2 hours)

Powerpoints with formulae and summary notes are used and supplemented by handwritten derivations of the formulae and examples which are projected onto the screen. Without context these notes are difficult to understand and are recorded live.

Tutorial (1 hour) & Workshop (1 hour)

The workshops and tutorials were similar in that they both consisted of being given a set of questions which the lecturers then went through for the class. Sometimes in the tutorials, questions were given, and it was simply time that you could go through material and ask the lecturer any questions you had.

iLectures Quality

iLectures were of good quality. The lecture notes were recorded on the screen as if they were lecture slides.

Learning materials

Textbook

Textbook reference: Course Notes for the 2017 exams in Subject CT4 (Chapters 1–6) from the Institute of Actuaries, Published by the ActEd.

Textbook importance: useful

The CT4 notes were very useful as they provided a more complete understanding of the content that was being covered as well as additional questions. They would be useful for anyone who cares about understanding the content.

List of other learning materials

- » Lecture slides/notes
- » Workshop and tutorial questions

Usefulness of learning materials

Content was delivered through lecture slides were provided for the first half of the unit followed by notes in the form of a pdf document for the second half of the unit.

The unit materials were quite disorganised on Blackboard. Solutions to questions were uploaded in a rather sporadic way. The lecture slides contained a lot of mistakes and skipped some explanations. They were sufficient to do questions but not to fully grasp the concepts. Writing notes in the second half of the unit was useful as they were quite thorough in their explanation, however they were not uploaded, and you needed to attend to obtain them.

General comments

The difficulty of this unit varied throughout the course of the semester. The assessment questions for a some of the later topics were quite challenging (noteworthy were the Kolmogorov forward/ backward equations), while earlier parts of the unit were comparatively quite simple to grasp. The assessments were quite predictable and had very reasonable questions. You could sometimes get away with just knowing how to do a certain type of question rather than actually understanding it generally. A proper understanding was still beneficial (particularly in the final exam).

Along with MATH2004, this unit is the first full-on actuarial unit in the degree, it should not be taken lightly.

The tutorial questions made good practice for learning the material.

Industry knowledge

Computer languages and software

None.

Industry practice

None.

Links to other units

Useful knowledge from previous units

Knowledge of expectation of random variables, in particular covariance and correlation from [STAT2001](#) (Mathematical Statistics) are very useful in stochastic processes.

The stochastic processes are covered at a basic level in [INDE2000](#) (optional unit).

Overlap with other units commonly taken concurrently

N/A

Useful topics for future units

The concept of the stochastic process is useful later in both [STAT3001](#) and [STAT3006](#).

Third Year Units

Semester 1

MATH3005 Survival Analysis

Unit nickname

Previous unit name

Survival

N/A

Challenge rating

Type of unit

Exemption

3.5

Compulsory for third year Actuarial Science stream CT4 → CS2

Information based on

Availability

Semester 1 2019

Semester 1 only

(edited from Semester 1 2018)

Prerequisites for this unit...

This unit is a prerequisite for...

[MATH2004](#)
[STAT2001](#)

Nil

Reliability of information

We suggest you check the [published unit outlines](#) for more information.

Syllabus/ Topics

- » Survival Models and the Life Table
- » Estimating the Lifetime Distribution
- » Proportional Hazard Models
- » Binomial and Poisson Models
- » Calculating group exposure to risk to estimate parameters
- » Statistical Tests for Graduation
- » Methods of Graduation

Assessments

Assessment name	Weighting
Test 1	15%
Test 2	15%
Tutorial Submissions	10%
Final Exam	60%

The tutorial submissions were a mix of R submissions and written question and answers, with usually a week to work on each one.

Learning activities

Lecture (2 hours)

In lectures, material was presented with little explanation alongside lecture notes that were projected on the screen in the form of a word document. Concepts were then demonstrated through examples taken directly from the CT4 notes and past exams which are available online, along with solutions. Content builds heavily from previous weeks as students are essentially studying steps in the methods of creating a life table from start to finish. This means staying on top of topics is particularly important. The lecturer also gives practical advice about their experiences with carrying out this process.

Tutorial (1 hour)

Tutorial questions were selected from past exams. These were marked based on your attempt, not necessarily whether you get them right. The tutorial consisted of the lecturer going through the solutions to the tutorial questions and giving advice for future tutorial questions.

Workshop (1 hour)

The workshops were split between computer-based workshops in R and Excel. Students were given an R markdown document with questions in it. Some of the workshops were assessed and had to be submitted on Blackboard a week or two later. All of the solutions to these workshops were posted on Blackboard after the due date.

iLectures Quality

Learning activities recorded: Lecture

Teaching style lent itself to being recording: Somewhat

The iLectures were of a very mediocre quality, however, the lecture notes and the CT notes are mostly sufficient for understanding the core theory of this unit.

Learning materials

Textbook

Textbook reference: Course Note for Subject CT4 from the Institute of Actuaries, published by the ActEd company

Textbook importance: Essential

List of other learning materials

- » Lecture notes in a word document
- » Tutorial questions (mark based on attempt)
- » Workshop questions
- » Past CT Exams and solutions

Usefulness of learning materials

General comments

This unit's assessments were quite mechanical, however, practical application of theory to questions can be difficult or confusing. Tutorials and workshops were generally a good indication of assessment questions. The topic of exposed to risk was of particular note, having a strong conceptual understanding of this was important for a number of questions. This unit is not particularly content heavy.

Industry knowledge

Computer languages and software

Languages: R

Software: Excel

Excel was used when studying graduation for workshops, more easily allowing us to conduct otherwise rigorous and tedious calculations by hand.

Industry practice

The lecturer provided a running commentary on industry practice throughout the lectures which is useful but not assessable. Basic knowledge of R and Excel procedures was practical but relatively basic. Links to other units

Useful knowledge from previous units

Knowledge of life tables from Principles of Actuarial Science ([ACTL1001](#))

Knowledge of Statistical Inference and testing from Statistical Data Analysis ([STAT1002](#))

Knowledge of estimation methods from [STAT2001](#).

Overlap with other units commonly taken concurrently

Covariates in model building processes also covered in Statistical Modelling ([STAT3001](#))
Study of survival functions covered in Life Contingencies 1 ([MATH3006](#)) heavily

Useful topics for future units

N/A

MATH3006 Life Contingencies 1

Unit nickname	Previous unit name
Life Con	N/A
Challenge rating	Type of unit
4.5	Compulsory for third year Actuarial Science stream
Information based on	Exemption
Semester 1 2019 (edited from Semester 1 2018)	CT5 → CM1
Information based on	Availability
Semester 1 2019 (edited from Semester 1 2018)	Semester 1 only
Prerequisites for this unit...	This unit is a prerequisite for...
MATH2004	Life Contingencies 2 (MATH3007)
Reliability of information	
We suggest you check the published unit outlines for more information.	

Syllabus/ Topics

- » Life assurance contracts
- » Life annuity contracts
- » The life table
- » Evaluation of assurances and annuities
- » Variable benefits and with profit policies
- » Commutation factors
- » Net premium and reserves
- » Gross premium and reserves

Assessments

Assessment name	Weighting
Test 1	10%
Test 2	10%
Tutorial Submissions	10%
Final Exam	70%

The tutorial submissions are marked attempts, to be submitted weekly.

Students get anywhere from a few days to a full week to work on a set of questions, sometimes they were due the same day the content was taught.

Learning activities

Lectures and workshops (3 hours)

Lectures and workshops ran back to back, effectively forming a 3-hour lecture which does not usually run for the full length. The lecture material was handwritten on a piece of paper which was projected onto the screen. Very Occasionally there would be some class participation where students went up and demonstrated examples on the whiteboard.

Tutorial (1 hour)

Tutorial questions based on the previous week's lecture, were posted on Blackboard about a week before the tutorial and had to be handed in at the start of the tutorial (marked based on your attempt, not necessarily whether you get them right). The tutorial consisted of the lecturer going through the solutions to the tutorial questions.

iLectures Quality

The style of lecture lent itself to being recorded, with only the occasional student participation component not being captured. However, historically there have been some issues with document viewers which can make iLectures unwatchable.

Learning activities recorded: Lecture

Teaching style lent itself to being recording: somewhat

Textbook

Textbook reference: Course Note for Subject CT5 from the Institute of Actuaries, published by the ActEd company

Textbook importance: Essential

List of other learning materials

- » Lecture notes (including examples) in a pdf document
- » Tutorial questions (mark based on attempt)
- » Past CT Exams and solutions

Usefulness of learning materials

The lecture notes were simultaneously thorough and concise. Students could easily learn and understand all the concepts in the course using only these notes. The solutions to exercises in the notes were not posted and some were not shown in the lecture. The exercises were however all taken directly from the CT5 notes and referenced, so the solutions could easily be looked up.

Some of the tutorial questions were useful for developing a greater understanding of the material while others were simply tedious. The practice of mechanically carrying out these calculations was useful practice for the time pressure in the assessments. Some of the tutorial questions were adapted versions of those found in the Q&A bank of the CT5 notes and others were original. The answers to the tutorials were always presented in tutorials.

General comments

While not conceptually difficult, this was a rather challenging unit. The assessments involved a lot of computation and looking up of tables which was time consuming.

A recommended examination technique for large questions would be to do the working out first, then calculate the answer for each once you had done working for all large questions. In most cases, there were more marks allocated to the working than the final answer and plugging in the numbers was what required the most time. Essentially, any strategy that will increase your accuracy and speed under time pressure is useful in this unit.

Due to rounding in tables and people using different methods (as well as their own rounding) slightly different final numerical answers with equally valid working out were prevalent in this unit.

Industry knowledge

Computer languages and software

Languages:

none

Software: Excel

Excel was used if one wished to refer to the life tables on computer for calculation checks or otherwise.

Industry practice

Some basic knowledge about life insurance such as types of contracts, pricing and reserving was covered in this unit.

In this unit you learn, through experience, why perfect decimal precision is of low practical importance when it comes to estimation.

Links to other units

Useful knowledge from previous units

Expands on actuarial notation developed in Theory of Interest ([MATH2004](#)) by including probabilities of cashflows contingent on human mortality.

Overlap with other units commonly taken concurrently

Overlap with Survival Analysis ([MATH2005](#)) around life table functions and future lifetime.

Useful topics for future units

This unit is expanded upon in Life Contingencies 2 ([MATH3007](#))

MATH3008 Survival Models & Analysis

Unit nickname	Previous unit name	
N/A	N/A	
Challenge rating	Type of unit	Exemption
?	New compulsory to be introduced in 2022	CS2
Information based on	Availability	
This is a new unit as at the date of publishing, we will endeavour to review it once it has been delivered for the first time	Semester 1 only (anticipated from 2022 onwards)	
Prerequisites for this unit...	This unit is a prerequisite for...	
Nil	Nil	

Reliability of information

This is a new unit at the time of release of this document.

We have provided as much information as we can find without input from those who took the unit.

This is units will replace [MATH3005](#) in 2022, so check that unit guide out for further information that could possibly be relevant.

We suggest you check the [published unit outlines](#) for more information.

Syllabus/ Topics

(Expected to be the same topics as [MATH3005](#))

- » Survival Models and the Life Table
- » Estimating the Lifetime Distribution
- » Proportional Hazard Models
- » Binomial and Poisson Models
- » Calculating group exposure to risk to estimate parameters
- » Statistical Tests for Graduation
- » Methods of Graduation

Learning activities

Lecture (2 hours)

Tutorial (1 hour)

Computer Lab (1 hour)

Industry knowledge

Computer languages and software

Languages: R

Links to other units

Useful knowledge from previous units

Knowledge of statistical inference and hypothesis testing from [STAT1005](#).

Knowledge of estimation methods from [STAT2001](#).

Overlap with other units commonly taken concurrently

Study of survival functions covered in Life Contingencies 1 ([MATH3006](#)) heavily

Useful topics for future units

N/A

MATH3009 Contingencies 1

Unit nickname	Previous unit name	
N/A	Life Contingencies 1	
Challenge rating	Type of unit	Exemption
?	New compulsory unit	CT5 → CM1
Information based on	Availability	
This is a new unit as at the date of publishing, we will endeavour to review it once it has been delivered for the first time	Semester 1 only	
Prerequisites for this unit...	This unit is a prerequisite for...	
MATH2004 Theory of Interest	Nil	
Reliability of information		
<p>This is a new unit at the time of release of this document. We have provided as much information as we can find without input from those who took the unit. This unit is very similar to the old unit MATH3006 (Life Contingencies 1), so much of the information on that unit will also apply to this one.</p> <p>We suggest you check the published unit outlines for more information.</p>		

Syllabus/ Topics

This unit covers the pricing and valuation (reserving) of insurance contracts for a single life contract assuming a constant deterministic interest rate. Practical knowledge is presented alongside mathematical techniques relevant to actuarial practice in life insurance and, by extension, related fields such as superannuation (pensions). Practical, hands-on modelling experience is developed through the use of Excel spreadsheets (students are assumed to have basic Excel skills prior to commencement of this unit).

Learning activities

Lecture (2 hours)

Tutorial (1 hour)

Workshop (1 hour)

Industry knowledge

Computer languages and software

Languages: VBA

Software: Microsoft Excel

Links to other units

Useful knowledge from previous units

N/A

Overlap with other units commonly taken concurrently

As the old [MATH3006](#) has overlap with [MATH3005](#), the new [MATH3008](#) is expected to have overlap with [MATH3009](#). This overlap will occur in the area of lifetable functions.

Useful topics for future units

N/A

STAT3000 Statistical Inference

Unit nickname	Previous unit name	
N/A	N/A	
Challenge rating	Type of unit	Exemption
2	Compulsory (Applied Statistics Major)	N/A
Information based on	Availability	
Semester 1 2018	Semester 1 Only	
Prerequisites for this unit...	This unit is a prerequisite for...	
STAT2001 (Mathematical Statistics)	Nil	

Reliability of information

We are yet to receive a submission for this unit. If you have taken this unit recently, please help us out by contributing as directed in the link at the top right of the page.

We have provided as much information as we can find without input from those who took the unit.

We suggest you check the [published unit outlines](#) for more information.

Syllabus/ Topics

- » Parameter estimation
 - ↳ Method of moments and quartiles
 - ↳ Maximum likelihood
 - ↳ Fisher information
 - ↳ Bayesian approach
 - ↳ Efficiency and sufficiency of estimates
 - ↳ Cramer-Rao inequality
- » Hypothesis testing
 - ↳ The Neyman-Pearson Lemma
 - ↳ Summarising data
 - ↳ Goodness of fit
- » Multivariate statistics
 - ↳ Random vectors
 - ↳ Multivariate distributions
 - ↳ Time series
 - ↳ Non-parametric estimation

Assessments

Assessment name	Weighting
In-class Test	30%
In-class quizzes	5%
Online Quizzes	15%
Final Exam	50%

Learning activities

Lecture (2 hours)

Lectures were explained using a slideshow and occasional additions made on the whiteboard. The slides contained the same content as the lecture notes which were uploaded.

Tutorial (1 hour) and Workshop (1 hour)

The workshops and tutorial sessions were combined together for a two-hour period. A worksheet was given out at the beginning of the lesson and students could independently complete the questions or work along other students to collaboratively complete the worksheet.

The lecturer would only interfere if students required assistance. Solutions for the worksheet were usually uploaded on the same night of the tutorial. The quiz marks and solutions, if applicable, were given at the beginning of this session.

iLecture Quality

The lecture was reasonable to follow at home as there were only a few things written on the board to compliment material which was already in the notes.

Learning materials

Textbook

The Lecture notes were in the form of a PDF (LaTeX) document and weekly tasks for the workshops were uploaded.

There are a few “recommended” texts in the unit outline for this unit but they are certainly not required to perform well in this unit. Should you be interested in gaining some more information about some of the topics, they are available to borrow from the library

The lecture notes can be a bit theoretical for some students but they are a sufficient resource to perform well in tests and exams.

Industry knowledge

Computer languages and software

None.

Industry practice

None.

Links to other units

Useful knowledge from previous units

This Unit draw significantly upon knowledge from [STAT2001](#).

Overlap with other units commonly taken concurrently

This unit has significant overlap with [STAT3001](#) (Statistical Modelling).

Useful topics for future units

[STAT3001](#) (Statistical Modelling).

STAT3001 Statistical Modelling

Unit nickname	Previous unit name
Stat Mod	N/A

Challenge rating	Type of unit	Exemption
4	Compulsory Third Year unit for Both Actuarial and Applied Stats stream	CT6

Information based on	Availability
Semester 1 2019 (edited from Semester 1 2018)	Semester 1 only

Prerequisites for this unit...	This unit is a prerequisite for...
MATH2001	N/A

Reliability of information

The Lecturer for this unit will likely change in 2020.
We suggest you check the [published unit outlines](#) for more information.

Syllabus/ Topics

- » Decision Theory (topic dropped in 2019)
- » Bayesian Statistics
- » Monte Carlo Simulation
- » Regression Models
 - ↳ Linear Regression
 - ↳ Generalised Linear Models
- » Logistic Regression
- » Time Series Analysis

Assessments

Assessment name	Weighting
Test 1	15%
Test 2	15%
Tutorial Submissions	10%
Final Exam	60%

The tutorial submissions are marked attempts, to be completed in class every week. Unlike [MATH3005](#), [MATH3006](#), [MATH3007](#) and [STAT3002](#), where the questions were released prior to submission, here students had to attempt the questions in class and submit within the hour. The tests had both a written and R component to them (equally weighted).

Learning activities

Lectures (2 hours)

In lectures material was presented along with explanation alongside lecture notes that were projected on the screen in the form of a word document. Concepts were then demonstrated (and sometimes introduced) through examples taken directly from the CT6 notes which were not referenced. The answers to the examples were not posted to Blackboard, so in order to obtain the solutions you either had to attend or have a copy of the CT6 notes.

Tutorial (1 hour)

Tutorial questions based on the previous week's lecture were posted on Blackboard a few days before the tutorial and had to be handed in at the start of the tutorial (marked based on your attempt, not necessarily whether you get them right). The tutorial consisted of the lecturer going through the solutions to the tutorial questions.

Workshop (1 hour)

The workshops were split between computer-based workshops in R and questions-based workshops.

In the R workshops, which were run by a different lecturer, we would work through an R markdown document. The lecturer who ran the computer lab would provide interesting and different explanations of the content and then demonstrate how they could be performed in R as students could follow along or do the questions themselves at their own pace. All of the solutions to these workshops were posted on Blackboard after the workshop.

In the other workshops, which were run by the usual lecturer, we were given time to try some questions (often taken from past assessments) and then the lecturer went through the solutions which would sometimes be posted to Blackboard.

iLectures Quality

The iLecture did not pick up anything written on the whiteboard. Since it was mostly solutions to exercises that were written on the whiteboard and were not uploaded to Blackboard, obtaining the solutions required attendance unless you had access to the CT6 notes (which is highly recommend). The audio was of reasonable quality (possible to follow at 2 times speed) and sections being covered in the lecture notes were picked up on the screen capture.

Learning activities recorded: Lecture

Teaching style lent itself to being recording: somewhat

Textbook

Textbook reference:

Course Note for Subject CT6 from the Institute of Actuaries, published by the ActEd company

Textbook importance: Essential

List of other learning materials

- » Lecture notes (including examples) in a pdf document
- » Tutorial questions and solutions (released after tutorial was run)
- » Workshop R-markdown files and their knitted counterparts
- » Past CT Exams and solutions
- » Other references to further textbooks were prescribed for pre-reading purposes, but was not essential.

Usefulness of learning materials

The lecture notes were essentially a heavily abridged version of the CT6 notes. They were lacking in explanation and were missing details and were thus insufficient for fully grasping all concepts.

General comments

The assessments during semester for this unit were quite manageable however the exam was much more difficult. A lot of the content is very dry and theoretical in nature despite potential for the topics to be much more practical and applied (the R workshops help slightly with this).

The tutorial questions were drawn from the previous weeks' content so it is important to constantly review this subject.

Furthermore, the content in each week built on previous weeks.

Industry knowledge

Computer languages and software

Languages:

R

Software: N/A

R was used heavily in workshops and tests. Students were frequently required to build models based on a provided set of data in an R-Markdown file provided.

It helps to be familiar navigating the platform quickly.

Industry practice

In the R workshops, a practical understanding of how generalised linear models and times series can be applied was demonstrated.

Links to other units**Useful knowledge from previous units**

Knowledge about correlation and stochastic processes from [STAT3005](#) is useful in the topic of time series.

If you did [MATH1017](#), you will know where the formula for linear difference equations (used in time series) comes from. If not, you can just accept it as a formula.

Knowledge of regression from [STAT1000](#) is useful when dealing with generalised linear models.

Knowledge of maximum likelihood estimation from [STAT2001](#) is important for Bayesian statistics and generalised Linear models.

An understanding of conditional and joint distributions from [STAT2001](#) is useful for Bayesian statistics.

Overlap with other units commonly taken concurrently

The concept of covariates from generalised linear models is also used in [MATH3005](#) (Survival Analysis).

Useful topics for future units

Topics such as Bayesian statistics and Inference is expanded upon in Risk Analysis and Credibility Theory ([STAT3002](#))

STAT3006 Investment Science 1

Unit nickname	Previous unit name
Investment	N/A
Challenge rating	Type of unit
4.5	Compulsory Third Year unit for Actuarial Stream
	Exemption
	CT8 → CM2
Information based on	Availability
Semester 1 2019 (edited from Semester 1 2018)	Semester 1 only
Prerequisites for this unit...	This unit is a prerequisite for...
ECON1000 or ECON1001 AND FNCE2000 AND MATH2004	STAT3007
Reliability of information	
We suggest you check the published unit outlines for more information.	

Syllabus/ Topics

- » The Efficient Markets Hypothesis
- » Utility theory
- » Stochastic dominance
- » Behavioural finance
- » Measures of investment risk
- » Models of asset returns
- » Portfolio theory
- » Asset pricing models
- » Brownian motion and martingales
- » Stochastic calculus and Ito processes
- » Stochastic models of security prices

Assessments

Assessment name	Weighting
Test 1	15%
Test 2	15%
Final Exam	70%

Worth noting test 1 was very easy and only directly drew content from the CT8 notes, whereas test 2 and the exam included tutorial, workshop and further, challenging content.

Learning activities

Lectures (2 hours)

In the lectures, material was thoroughly explained and expanded upon. Some notes were written up on the board and uploaded to Blackboard at the end of the lecture (handwritten scanned pdf). Some small aspects of the assessable material were not covered in the lectures and were expected to be read by the student from the CT8 notes.

Tutorial (1 hour)

There would be a question which students time would have to do in groups and then the lecturer would call up a random group to demonstrate the solution to the class. These were not assessed. Although questions were selected from past exams, the lecturer's recommended solution would frequently vary from the solutions provided by ActEd.

Workshop (1 hour)

Workshops explored practical uses of Excel to explore and solve problems related to the content. Many topics explored in the workshops are not directly accessible but are useful in terms of understanding different applications of the theory.

iLectures Quality

While you could not read what was written on the whiteboard, the style of lecture mainly focussed on what the lecturer said (the audio quality was fine) and anything they wrote down was uploaded to Blackboard. The written notes are useful, but quite confusing without context.

Learning activities recorded: Lecture

Teaching style lent itself to being recording: somewhat

Textbook

Textbook reference:

Course Note for Subject CT8 from the Institute of Actuaries, published by the ActEd company

Textbook importance: Essential

The CT8 notes were absolutely essential for this unit and supplemented the handwritten notes, which at times provided insufficient, though they contained lists, formula and diagrams. There is a lot of contextual content which is only covered in the notes. The latest or a recent version (2018 or later) of the notes was also important since the content changes frequently.

List of other learning materials

- » Handwritten lecture notes (scanned PDF)
- » Tutorial questions and solutions
- » Workshop questions and solutions

Usefulness of learning materials

Many tutorial questions were from/adapted from past CT exams and provided good indicators of the level of difficulty of the final exam.

Workshops tended to have a practical element to them and focused on developing understanding of the content.

General comments

This unit had a lot of content and theory. The tests and exams were rigorous in nature and the having a thorough knowledge of the CT8 notes was essential. That being said, you always knew what to expect in this unit as the lecturer was a strong communicator in lectures and provided a description of the composition of assessments. Each test or exam was 70% “bookwork” and 30% applications. This, combined with the fact that the lecturer tried to give each topic equal weighting meant students were rewarded for effort when studying for this unit.

Industry knowledge

Computer languages and software

Languages:

N/A

Software: Excel

Excel was featured in the workshops, where students would often work through questions without rigorous and tedious calculations by hand, for example share price simulation using an stochastic differential equation.

Industry practice

The lecturer provided a number of interesting examples and anecdotes about their experience in industry alongside a number of the topics covered in this unit. The concepts which were and weren't actually used in practice were frequently highlighted by the lecturer. The workshop questions using excel were often real-world applications using real data such as the ASX closing values.

Links to other units

Useful knowledge from previous units

Knowledge of stochastic processes from [STAT3005](#) is useful in this unit.

A number of economic concepts such as utility are useful from economics units (i.e. [ECON1000](#), [ECON1001](#), [ECON2001](#)).

The concept of the force of interest from [MATH2004](#) (Theory of Interest) is assumed knowledge for this course. In this unit, by convention, all interest rates are assumed to be continuously compounded (i.e. forces of interest) unless stated otherwise.

Variation of parameters as a technique for solving ODEs (Ordinary Differential Equations) from [MATH2009](#) (Calculus 2) is analogous to the technique used for solving the Ornstein-Uhlenbeck SDE (Stochastic Differential Equation).

Lagrange multipliers from [MATH2009](#) (Calculus 2) are used to solve the constrained optimisation problems that come up in mean variance portfolio theory.

Overlap with other units commonly taken concurrently

N/A

Useful topics for future units

This entire unit is expanded upon in [STAT3007](#) (Investment Science 2), stochastic calculus and martingales are particularly prevalent and assumed knowledge.

STAT3009 Risk Analysis

Unit nickname	Previous unit name	
N/A	N/A	
Challenge rating	Type of unit	Exemption
?	New compulsory unit for the actuarial science third year stream to be introduced in 2022	CS1 (includes new topics not previously in CT3 as well as some that have been shifted over from CT6)
Information based on	Availability	
This is a new unit as at the date of publishing, we will endeavour to review it once it has been delivered for the first time	Semester 2 only (anticipated to from 2022 onwards)	
Prerequisites for this unit...	This unit is a prerequisite for...	
STAT2001	Nil	

Reliability of information

This is a new unit at the time of release of this document. It will not be delivered until 2022.

We have provided as much information as we can find without input from those who took the unit.

This is one of the units that will replace STAT3002 in 2022 (the other is [STAT3009](#)), so check that unit guide out for further information that could possibly be relevant.

We suggest you check the [published unit outlines](#) for more information.

Syllabus/ Topics

- » Bayesian statistics in credibility theory
- » Loss distributions
 - ↳ Compound distributions
 - ↳ Risk modelling
- » Copulas (account for tail dependencies in distributions)

Learning activities

Lecture (2 hours)

Tutorial (1 hour)

Workshop (1 hour)

Industry knowledge

Computer languages and software

Languages: R

Software: Excel

“Hands on modelling experience”

Links to other units

Useful knowledge from previous units

As many of the topics in this units were previously under [STAT3002](#), we have a reasonable idea of what will be useful.

Bayesian statistics covered in [STAT3001](#) will helpful for the Bayesian aspects of this unit.

The plethora of probability distributions covered in [STAT2001](#) and [STAT3001](#) will be used again for loss distributions.

Although this is a new topic, it is anticipated that previous knowledge of joint distributions from [STAT2001](#) will be useful for the study of copulas. Incidentally, copulas is expected to be quite a challenging topic conceptually, so refreshing your knowledge of joint distributions could prove useful.

Overlap with other units commonly taken concurrently

N/A

Useful topics for future units

Copulas are discussed conceptually at times in honours units such as [ACTL4000](#), [ACTL4001](#) and ACTL4002.

STAT3010 Financial Engineering 2

Unit nickname	Previous unit name	
N/A	N/A	
Challenge rating	Type of unit	Exemption
?	New compulsory unit	CM2
Information based on	Availability	
This is a new unit as at the date of publishing, we will endeavour to review it once it has been delivered for the first time	Semester 1 only	
Prerequisites for this unit...	This unit is a prerequisite for...	
STAT3006 Investment Science 1	Nil	
Reliability of information		
<p>This is a new unit at the time of release of this document. We have provided as much information as we can find without input from those who took the unit. This unit will be similar to STAT3007 Investment Science 2, with an additional computer-based component (Microsoft Excel). We suggest you check the published unit outlines for more information.</p>		

Syllabus/ Topics

- » Introduction to the valuation of derivative securities
- » The Greeks
- » The binomial model
- » The Black – Scholes option pricing formula
- » The 5 – step method in both discrete and continuous time (risk neutral approach to pricing derivatives)
- » The term structure of interest rates
- » Credit risk

Learning activities

Lecture (2 hours)

Tutorial (1 hour)

Workshop (1 hour)

Industry knowledge

Computer languages and software

Software: Microsoft Excel

Links to other units

Useful knowledge from previous units

Stochastic calculus from [STAT3006](#) will be used heavily in this unit.

Overlap with other units commonly taken concurrently

N/A

Useful topics for future units

N/A

Semester 2

MATH3007 Life Contingencies 2

Unit nickname		Previous unit name
Life Con		N/A
Challenge rating	Type of unit	Exemption
5	Compulsory Third Year unit for Actuarial Stream	CT5 → CM1
Information based on		Availability
Semester 2 2019 (edited from Semester 1 2018)		Semester 2 only
Prerequisites for this unit...		This unit is a prerequisite for...
MATH3006 (Life Contingencies 1)		N/A
Reliability of information		
We suggest you check the published unit outlines for more information.		

Syllabus/ Topics

- » Assurances and annuities involving two independent lives.
- » Contingent and reversionary benefits
- » Competing risks
 - ↳ Multiple Decrement Tables
 - ↳ Uniform distribution of decrement assumption
- » Pension funds
- » Profit testing and reserves
- » Mortality, selection and standardisation

Assessments

Assessment name	Weighting
Test 1	10%
Group Presentation	10%
Tutorial Submissions	10%
Final Exam	70%

-Tutorial submissions are marked by attempt (needn't be correct) and were weekly, giving students roughly a week to answer a small set of (difficult at times) questions.

-The group presentation was in groups of 4 or 5, randomly allocated, and required the use of Excel to refer to life tables to present a practical model.

Learning activities

Lectures (2 hours)

The approach taken was to talk about the material for a few minutes and then do some examples from the lecture notes. These examples were generally taken directly from the CT notes but were not referenced so it was convenient to watch the lecture in order to get the solution.

Tutorial (1 hour)

Some tutorial questions were uploaded a few days before the class and students were expected to attempt them before class. 10% of our final grade went towards our attempt in these classes. While this was easy marks since you did not need to be correct, these questions were often challenging and time consuming in

nature. They were, however, often found somewhere in the Q&A bank of the CT notes which was useful for checking your answer once you had attempted them.

During the actual class the lecturer went through the solution to the question, usually skipping a lot of steps. Complete answers were generally not uploaded to Blackboard so if the question did not appear in the CT notes, you had to attend to find out the correct answer (you had to be there anyway to submit your attempt).

Workshop (1 hour)

Workshops in this unit were essentially an extra tutorial where a problem set was posed to the class and after 15-20 minutes the lecturer would go over the solution on the board.

A handful of workshops toward the end of semester are allocated to discussions regarding the group assignment, however it reverted to problem solving-style lessons after 2 such classes.

iLectures Quality

As the solutions to questions were written on the whiteboard, the most useful part of the lecture was impossible or difficult to follow using the iLecture. The section of the lecture notes being covered was captured on the screen recording.

Learning activities recorded: Lecture

Teaching style lent itself to being recording: somewhat

Textbook

Textbook reference:

Course Note for Subject CT5 from the Institute of Actuaries, published by the ActEd company

Textbook importance: Essential

The CT5 notes were essential for this unit, not only for additional explanations of the content but additional questions. In particular, Pension Funds (which were important for the 2018 assignment) were quite rushed when they were gone through in the lecture as there is lots to cover, meaning looking over the chapter for them in the CT notes was pretty important.

List of other learning materials

- » Lecture notes (scanned PDFs and word documents)
- » Tutorial questions (full solutions generally not given)
- » Workshop questions (full solutions generally not given)

Usefulness of learning materials

The lecture notes were essentially a condensed version of the CT notes. In some topics this was well executed and in others it wasn't. A combination of the CT notes and the lecture notes were probably necessary to gain a full understanding of every topic.

When studying decrement tables, the entirety of the notes were provided – the content was not available in the CT notes yet decrement tables were examinable.

The workshop questions were often past exam questions which made for useful practice, however questions of the same type were avoided for the most part in the final exam.

There was a section given in the lecturers notes when studying decrement tables which was not covered in the CT notes, yet examinable nonetheless.

The tutorial questions were often good development questions for increasing understanding but often took a long time. The fact your attempt (but not necessarily correct answer) was assessed was a reasonable incentive to have a go at the tutorial.

General comments

This was an immensely difficult unit.

It expands on Life Contingencies 1 meaning it has the same tiresome and rigorous level of computation in many questions with an added level of conceptual complexity. You may or may not have learnt this from [MATH3006](#) (Life Contingencies 1) but do not get complacent in this unit.

The exam was particularly difficult in this unit and also weighted 70%. Make sure you are very familiar with the content, not only from this unit but [Life Contingencies 1](#) since it is assumed knowledge (it might not be assessed directly but knowledge is sometimes needed to answer questions).

Do not go in to the exam chasing marks, always be ahead, I cannot stress how important it is to start well in this unit.

Industry knowledge

Computer languages and software

Languages: VBA

Software: Excel

Excel was used when reference to life tables was desired for ease of computation for tutorials or otherwise. The assignment for 2019 was based in excel and although we weren't being marked on our spreadsheet/VBA coding ability, it absolutely plays a role in the ease of which your group can complete the project, definitely worth reviewing beforehand.

Industry practice

In the 2018 assignment on Pension Funds we were given the practical task of building an excel model to value some superannuation fund benefits. This certainly improved our knowledge of the superannuation industry from the point of view of the Actuary.

The 2019 assignment focused on building a model to calculate pensions in retirement, given a whole range of inputs and desired payment structures, this project forced us to consider wider economic assumptions rather than mechanically churning out numbers as we all know too well.

Links to other units

Useful knowledge from previous units

All of [MATH3006](#) (Life Contingencies 1) is important for this unit as it builds on this knowledge.

Overlap with other units commonly taken concurrently

N/A

Useful topics for future units

N/A

MATH3010 Contingencies 2

Unit nickname	Previous unit name	
N/A	N/A	
Challenge rating	Type of unit	Exemption
?	New compulsory unit	CT5 → CM1
Information based on	Availability	
This is a new unit as at the date of publishing, we will endeavour to review it once it has been delivered for the first time	Semester 2 only	
Prerequisites for this unit...	This unit is a prerequisite for...	
MATH3006 Life Contingencies 1 or any previous version	Nil	
Reliability of information		
<p>This is a new unit at the time of release of this document.</p> <p>We have provided as much information as we can find without input from those who took the unit.</p> <p>This unit is very similar to the old unit MATH3007 (Life Contingencies 2), so much of the information on that unit will also apply to this one.</p> <p>We suggest you check the published unit outlines for more information.</p>		

Syllabus/ Topics

This unit covers the pricing and valuation (reserving) of insurance contracts for a single life contract assuming a constant deterministic interest rate. Practical knowledge is presented alongside mathematical techniques relevant to actuarial practice in life insurance and, by extension, related fields such as superannuation (pensions). Practical, hands-on modelling experience is developed through the use of Excel spreadsheets (students are assumed to have basic Excel skills prior to commencement of this unit).

Learning activities

Lecture (2 hours)

Tutorial (1 hour)

Workshop (1 hour)

Industry knowledge

Computer languages and software

Languages: VBA

Software: Microsoft Excel

Links to other units

Useful knowledge from previous units

N/A

Overlap with other units commonly taken concurrently

N/A

Useful topics for future units

N/A

STAT2004 Analytics for Observational Data

Unit nickname	Previous unit name	
N/A	N/A	
Challenge rating	Type of unit	Exemption
?	Compulsory unit for the applied statistics third year stream	N/A
Information based on	Availability	
Yet to be reviewed	Semester 2 only	
Prerequisites for this unit...	This unit is a prerequisite for...	
STAT2003	Nil	

Reliability of information

We are yet to receive a submission for this unit. If you have taken this unit recently, please help us out by contributing as directed in the link at the top right of the page.

We have provided as much information as we can find without input from those who took the unit.

We suggest you check the [published unit outlines](#) for more information.

Syllabus/ Topics

- » Multivariate statistics
 - ↳ Random sampling
 - ↳ Mean vectors
 - ↳ Correlation and covariance matrices
 - ↳ Generalised variances
 - ↳ Multivariate normal distributions
- » Multivariate statistical analysis techniques
 - !! Principle components analysis (PCA)
 - !! Discriminant analysis
 - !! Clustering techniques
- » Machine learning methods

Assessments

Assessment name	Weighting
Computer-based test 1	20%
Computer-based test 1	30%
Project	50%

Learning activities

Lecture (2 hours)

Computer Lab (2 hour)

Workshop (1 hour)

Learning materials

Textbook

No textbook was prescribed for this unit.

Industry knowledge

Computer languages and software

Languages: R

Industry practice

Links to other units

Useful knowledge from previous units

N/A

Overlap with other units commonly taken concurrently

N/A

Useful topics for future units

N/A



STAT3002 Risk Analysis and Credibility Theory

Unit nickname	Previous unit name
Risk/RACT	N/A
Challenge rating	Type of unit
4.5	Compulsory Third Year unit for Actuarial Stream
	Exemption
	CT6 → CS2
Information based on	Availability
Semester 2 2019 (edited from Semester 1 2018)	Semester 2 only
Prerequisites for this unit...	This unit is a prerequisite for...
STAT2001	N/A
Reliability of information	
We suggest you check the published unit outlines for more information.	

Syllabus/ Topics

- » Loss Distributions
- » Reinsurance
- » Risk models
- » Credibility theory
- » Ruin Theory
- » Run-off triangles

Assessments

Assessment name	Weighting
Test 1	15%
Test 2	15%
Tutorial Submissions	10%
Final Exam	60%

Tutorial submissions are marked by attempt (needn't be correct) and were weekly, giving students had roughly a week to answer a small set of questions.

Learning activities

Lectures (2 hours)

The approach taken was to talk about/read over the material for a few minutes and then do some examples from the lecture notes. These examples were generally taken directly from the CT notes but were not referenced so it was convenient to watch the lecture in order to get the solution. At times lectures and the solutions were rushed through, with many students resorting to taking pictures on their phones for later reference.

Tutorial (1 hour)

The tutorial questions were uploaded less than week before the class and we were expected to attempt them before attending. We handed them in at the beginning of the class and then the lecturer went through the solution (with some handwaving) on the board

Workshop (1 hour)

In workshops, the lecturer handed out printed copies of past exam questions (which were not uploaded). We were given time to try them ourselves and then the lecturer went through them on the board. Workshops were not recorded.

iLectures Quality

As the solutions to questions were written on the whiteboard, the most useful part of the lecture was impossible or difficult to follow using the iLecture. The section of the lecture notes being covered was captured on the screen recording.

Learning activities recorded: Lecture

Teaching style lent itself to being recording: somewhat

Textbook

Textbook reference: Course Note for Subject CT6 from the Institute of Actuaries, published by the ActEd company

Textbook importance: Essential

The CT notes alone are probably not necessary to gain a full understanding of the content. While the notes do contain some unnecessary information, they are also useful for understanding things that are not covered sufficiently in lectures.

List of other learning materials

- » Lecture notes (scanned PDFs and word documents)
- » Tutorial questions (full solutions generally not given)
- » Workshop questions (full solutions generally not given)

Usefulness of learning materials

The lecture notes were essentially a condensed version of the CT notes. Some of the information that was omitted was actually useful however so you had to be careful. They were also more difficult to read a lot of the time and intentionally missed information to make people attend the lecture.

The tutorial and workshop questions were generally quite useful for understanding material better and knowing what to expect in assessments.

General comments

This unit uses a lot of topics from [STAT2001](#) (Mathematical Statistics) so it is important to look back and make sure you understand them. The tests were quite manageable and of similar style to weekly tutorial submissions, but the exam was quite challenging it contained a number of questions of an unfamiliar style.

Be sure to be familiar with the actuarial formulae textbook, as often you could get a few free marks from knowing a certain formula exists.

Industry knowledge

Computer languages and software

Languages: N/A

Software: N/A

Industry practice

There are some concepts of reinsurance and general insurance discussed but not assessed in this unit.

Links to other units

Useful knowledge from previous units

Moment generating functions, common distributions, convolutions and methods of estimation from [STAT2001](#) (Mathematical Statistics) are all used heavily in this unit for anything relating to risk models and loss distributions.

Manipulation of distributions and posterior distributions are used similarly in the way they were in [STAT3001](#) (Statistical Modelling).

Bayesian statistics from [STAT3001](#) (Statistical Modelling) is used for credibility.

Ruin theory and Compound Poisson processes which are defined but not actually used in [STAT3005](#) (Stochastic Processes), are actually used in this unit.

Overlap with other units commonly taken concurrently

N/A

Useful topics for future units

N/A

STAT3007 Investment Science 2

Unit nickname	Previous unit name
Investment	N/A
Challenge rating	Type of unit
4	Compulsory
	Exemption
	CT8 → CM2
Information based on	Availability
Semester 2 2019 (edited from Semester 2 2018)	Semester 2 only
Prerequisites for this unit...	This unit is a prerequisite for...
STAT3006	Nil
Reliability of information	
We suggest you check the published unit outlines for more information.	

Syllabus/ Topics

- » Introduction to the valuation of derivative securities
- » The Greeks
- » The binomial model
- » The Black – Scholes option pricing formula
- » The 5 – step method in both discrete and continuous time (risk neutral approach to pricing derivatives)
- » The term structure of interest rates
- » Credit risk

Assessments

Assessment name	Weighting
Simulation exercise	15%
Test	15%
Final Exam	70%

The simulation exercise was a group assignment using the Black – Scholes option pricing formula, the application of the formula is straightforward enough and the more specific content details are covered in the weeks following submission.

Although the formula is simple to apply in excel, the task is still worth 15% and so it is recommended to take care with the presentation and justification of certain assumptions.

The test and exam was a combination of CT content and lecturers adaptations on tutorial questions – they were very reasonable.

Learning activities

Lecture (2 hours)

In the lectures, material was thoroughly explained and expanded upon. Some notes were written up on the board and uploaded to Blackboard at the end of the lecture (handwritten scanned pdf). Some small aspects of the assessable material were not covered in the lectures and were expected to be read by the student from the CT8 notes.

Tutorial (1 hour)

There would be a question which students would have time to attempt themselves. In the second half of the tutorial, the lecturer would demonstrate the solution to the class. Occasionally they would ask students to show the solution instead when easier topics were covered.

Workshop (1 hour)

There would be a question which students be given time to attempt and then the lecturer would go through the solution at the end. The workshops were often done in excel. The solutions to workshops were always posted after the class.

iLectures Quality

Learning activities recorded: lecture

Teaching style lent itself to being recording: no

While you could not read what was written on the whiteboard, the style of lecture mainly focused on what the lecturer said (the audio quality was fine) and anything they wrote down was uploaded to Blackboard.

Learning materials

Textbook

Textbook reference: CT8 notes

Textbook importance: essential

The CT8 notes were absolutely essential for this unit. The latest or a recent version of the notes was also important since the content changes frequently.

List of other learning materials

- » Course Notes for Subject CT8 from the Institute of Actuaries, published by the ActEd Company • Lecture notes (handwritten scanned pdf)
- » Tutorial questions
- » Workshop questions

Usefulness of learning materials

The lecture notes were very limited and needed to be supplemented by the CT8 notes. Their purpose was to keep note of what was written on the board, not to cover everything. The tutorial questions were normally past institute exam questions. The workshop questions were normally made up by the lecturer and quite challenging in nature. The solution done in excel often required some obscure knowledge about finance which was not previously taught.

General comments

The main focus of this unit is derivative securities, with a particular focus on the pricing of options. As in [STAT3006](#) (Investment Science 1), you knew what to expect in tests and the exam in this unit. This unit was however more mathematical, with less worded question and as such, many students found it to be the easier of the two.

Industry knowledge

Computer languages and software

Software: Excel

The workshop questions using excel were often real-world applications using real data.

Industry practice

The lecturer provided a number of interesting examples and anecdotes about their experience in industry alongside a number of the topics covered in this unit. The concepts which were and weren't actually used in practice were frequently highlighted by the lecturer.

Links to other units

Useful knowledge from previous units

The foundation laid in [STAT3006](#) (Investment Science 1) with regard to stochastic calculus and martingales was expanded upon in this unit. An understanding of the binomial distribution and Bernoulli trials from [STAT1001](#) was helpful in understanding the binomial model. An appreciation of how boundary conditions work from [MATH2009](#) (Calculus 2) was useful but not essential in comprehending the Black-Scholes PDE.

The basics of derivative contracts from [FNCE2000](#) and [MATH2004](#) was useful for this unit. The term structure of interest rates were covered in [MATH2004](#) however the notation was very different.

Overlap with other units commonly taken concurrently

Students who take optional unit, [INVE3000](#) (Introduction to Derivative Securities) see significant overlap with this unit. It is however done in a far less mathematically rigorous way but does spend more time on topics which are covered very quickly in investment science 2.

Useful topics for future units

N/A

STAT3008 Provisioning Techniques

Unit nickname	Previous unit name	
N/A	N/A	
Challenge rating	Type of unit	Exemption
?	New compulsory unit for the actuarial science third year stream to be introduced in 2022	CM2
Information based on	Availability	
This is a new unit as at the date of publishing, we will endeavour to review it once it has been delivered for the first time	Semester 2 only (assumed)	
Prerequisites for this unit...	This unit is a prerequisite for...	
STAT3007 or STAT3010	Nil	
Reliability of information		
<p>This is a new unit at the time of release of this document.</p> <p>We have provided as much information as we can find without input from those who took the unit.</p> <p>See the unit guide for STAT3002 for a similar unit under the old curriculum. This unit is not expected to be offered until 2022.</p> <p>We suggest you check the published unit outlines for more information.</p>		

Syllabus/ Topics

- » Loss distributions
- » Risk models
- » Credibility theory
- » Ruin theory
- » Run-off triangles
- » Projecting Ultimate position

Learning activities

Lecture (2 hours)

Tutorial (1 hour)

Workshop (1 hour)

Industry knowledge

Computer languages and software

Not known but likely to include Excel.

Links to other units

Useful knowledge from previous units

[STAT2001](#) will be useful for many of these topics. The prerequisites will not.

Overlap with other units commonly taken concurrently

N/A

Useful topics for future units

N/A

Honours Units

Semester 1

ACTL4000 Actuarial Control Cycle 1

Unit nickname	Previous unit name	
ACC1 or Control Cycle	N/A	
Challenge rating	Type of unit	Exemption
5	Compulsory/ Optional/ Elective unit /old unit	Actuarial Control Cycle from the Actuary Program (previously part II)
Information based on	Availability	
Semester 1 2019	Semester 1 only	
Prerequisites for this unit...	This unit is a prerequisite for...	
Nil	ACTL4004 ACTL4001 (removed)	

Reliability of information

There may be small changes to this unit to comply with the new actuarial curriculum changes. The syllabus from the Actuaries Institute has not changed much so they will be minor.

We suggest you check the [published unit outlines](#) for more information.

Syllabus/ Topics

- » Overview of the control cycle
- » Context of actuarial work
- » Risk management frameworks
- » Applying risk management
- » Need for financial products
- » Product Design
- » Need for capital
- » Modelling
- » Data and assumptions
- » Pricing

Assessments

Assessment name	Weighting
Written Report	15%
Presentation	15%
Class Discussion	10%
Exam	60%

The presentation assessment involved performing some data analysis on health insurance products in Excel for an external person from industry.

The exam was quite challenging.

Learning activities

Lecture (2 hours)

During lectures the lecturer would partially present material with notes on the board and partially conduct a discussion on the material. It was expected that students pre-read chapters of the textbook. This pre-reading was vital to being included as part of the discussion.

Tutorial (1 hour) and Workshop (1 hour)

The tutorial and workshops were run back-to-back and comprised of students working together (with one person on the whiteboard) to answer some prescribed questions. They were typically exam-style questions and students were encouraged to tackle them using a “framework” learnt in lectures and pre-reading. The lecturer would intervene when students were stuck and provided feedback where appropriate but this learning activity was student-lead.

Students were expected to have a look at the questions and give them a go beforehand.

iLectures Quality

None of the above learning activities were recorded.

Learning materials

Textbook

Textbook reference: [Understanding Actuarial Management](#) by Bellis, Lyon, Klugman and Shepherd.

Textbook importance: essential

Note that the textbook might change with the new curriculum but this is unlikely due to the lack of change specifically in the control cycle subject.

The textbook was essential for this unit. All pre-readings came from the textbook and “bookwork” questions in the exam were based on material from the textbook.

If you don't wish to purchase the textbook, some copies are available from the Curtin library. It could be a good idea to get it out and have a look through it before you start the semester. Perhaps ask someone in a lower year to borrow it for you if you no longer can because you are between degrees.

List of other learning materials

- » Lecture notes (PDF from PowerPoint).
- » Workshop and tutorial questions (PDF).
- » Various external resources and articles.

Usefulness of learning materials

The lecture slides were a useful, condensed version of the textbook with some added information and clarification. It was advisable to look at the lecture slides first when preparing for the exam as they contained the main things we needed to know.

The tutorial and workshop questions were quality exam-style questions that assisted us with knowing what to expect in the exam.

The other materials varied in their usefulness, with some being rather cumbersome to read while others were quite useful. The Solvency II Glossary and APRA PAIRS Guide were notably useful references.

General comments

Pre-reading was quite important in this unit. It was at times challenging to keep up with amongst all one's other obligations (either work or honours) but nevertheless vital for getting the most out of class.

Participation in class was assessed and pre-reading naturally assisted with this.

This is typically the first associateship-level course taken by students. It can be something of a shock that it is a written-response style unit as opposed to the mathematics-heavy units actuarial students will be accustomed to. With that being said, it is not an essay-based unit, indeed most of the questions are short answer with bullet points and diagrams often being appropriate answers to questions. The ability to write concise and coherent answers with little “fluff” is valued in this unit.

This unit covered a large amount of information, much of which needed to be rote-learned for the exam. Employing memorisation strategies is advisable. Application-style questions were covered in the exam which required a strong understanding of the content to perform well in.

Industry knowledge

Computer languages and software

Software: Excel

The use of Excel was used the presentation assignment and some of the in-class work in the workshops and tutorials.

Industry practice

This unit (and part II in general) provides the 'critical thinking' aspect of an actuary that you don't see in the technical actuarial subjects. This unit is all about the business world and putting your knowledge into practice.

The presentation assessment for this to an individual from industry who actually used our research. This was based on particular convenience at that time but it may well happen again.

Links to other units

Useful knowledge from previous units

Knowledge from previous CT units taken is assumed in this unit. Although it is fairly self-contained.

Knowledge of economics from any previous units such as [ECON1000](#), [ECON1001](#) and [ECON2001](#) is particularly useful.

Understanding of the actuarial profession from [ACTL1001](#) and [ACTL1000](#) is helpful.

Overlap with other units commonly taken concurrently

N/A

Useful topics for future units

[ACTL4001](#) Actuarial Control Cycle 2 follows on from this unit but covers topics that are fairly independent.

[ACTL4002](#) makes use of risk management frameworks covered in this unit.

The new unit, [ACTL4004](#) is meant to expand on risk management and product design taught in this unit.

ACTL4003 Predictive Analytics Principles

Unit nickname	Previous unit name	
N/A	N/A	
Challenge rating	Type of unit	Exemption
?	New compulsory honours unit in 2020	The new university delivered Data Analytics Principles subject of the Actuary program
Information based on	Availability	
This is a new unit as at the date of publishing, we will endeavour to review it once it has been delivered for the first time	Semester 1 only	
Prerequisites for this unit...	This unit is a prerequisite for...	
Nil	Nil	
Reliability of information		
This is a new unit at the time of release of this document. We have provided as much information as we can find without input from those who took the unit. We suggest you check the published unit outlines for more information.		

Syllabus/ Topics

- » Data analytics and the business environment
- » Data understanding and preparation
- » Modelling
 - ↳ Nomenclature
 - ↳ Feature selection and treatment
 - ↳ Implementation and comparison of various modelling techniques GLM, shrinkage methods, tree-based methods and neural networks
 - ↳ Validation techniques
- » Evaluation of model appropriateness and performance
- » Communication

Learning activities

Lecture (2 hours)

Computer Lab (2 hour)

Industry knowledge

Computer languages and software

Languages: R

Industry practice

The Actuaries Institute curriculum for this unit is specifically designed to be relevant to usage in the workforce.

Links to other units

Useful knowledge from previous units

Any knowledge of R from previous knowledge will be useful for this unit.

A significant portion of this unit focusses on modelling, so [STAT3001](#) knowledge will inevitably be useful.

Overlap with other units commonly taken concurrently

The way in which modelling ties in with the actuarial control cycle is part of the curriculum for both this unit and [ACTL4000](#) (at the very least as it was in 2019).

Useful topics for future units

N/A

Semester 2**ACTL4001 Actuarial Control Cycle 2**

Unit nickname	Previous unit name	
ACC2 or control cycle	N/A	
Challenge rating	Type of unit	Exemption
5	Compulsory honours unit	Actuarial Control Cycle from the Actuary Program (previously part II)
Information based on	Availability	
Semester 2 2019	Semester 2 only	
Prerequisites for this unit...	This unit is a prerequisite for...	
ACTL4000 (has now been removed as a prerequisite in 2020)	Nil	
Reliability of information		
Due to the changes in the actuarial curriculum by the Actuaries Institute in 2020, some changes may occur to the content but they are only expected to be minor for this particular subject.		
We suggest you check the published unit outlines for more information.		

Syllabus/ Topics

- » Professionalism
- » Regulation
- » Valuing Liabilities
- » Assets
- » Solvency
 - ↳ Capital requirements
 - ↳ Risk management
- » Profit
- » Monitoring experience
- » Responding to experience

Assessments

Assessment name	Weighting
Class discussion	10%
Group Presentation	15%
Report	15%
Exam	60%

The class discussion was based on contribution to the discussion in all classes as well as the weekly "newsbite". Each member of the class was assigned a week to talk about a recent news article, relevant to the topic covered (e.g. assets) that week and link it back to weekly reading from the textbook. Other members of the class would then engage in a discussion. To obtain a high mark in the class discussion you should conduct yourself with confidence (being well-prepared helps with this) and try to bring others into the discussion (strike a balance between talking and listening).

In the group presentation, the 6-person class was split into three. It involved a modelling and reporting task of insurance liabilities and profit that was completed in Excel. Results were then presented in a mock board meeting.

In 2019, the report involved performing research on technology in finance. Note that the formatting and general layout of the report was scrutinised closely by the lecturer. It was important to make it look professional.

The lecturer was very helpful with providing assistance and intermediate feedback on assessments. Don't be afraid to ask.

The exam for this unit was extremely challenging. Obtaining good grades in the other assessments to create a buffer is important.

Learning activities

Lecture (2 hours)

Lectures were similar to [ACTL4000](#) in the sense that they involved a significant amount of class discussion.

As class discussion was a part of assessment, it was important to contribute your point of view and to be well prepared for classes.

Tutorial (1 hour) and Workshop (1 hour)

The tutorial and workshop ran back-to-back and the lines were blurred between them. Both involved attempting questions, sometimes in the as a class on the board, sometimes in smaller groups, sometimes in Excel. These tasks often involved a discussion of some reading material, often related to current events that tied in well with that week's topic.

iLectures Quality

None of the above learning activities were recorded. This might however change in future.

Learning materials

Textbook

Textbook reference: [Understanding Actuarial Management](#) by Bellis, Lyon, Klugman and Shepherd.

Textbook importance: essential

Note that the textbook might change with the new curriculum but this is unlikely due to the lack of change specifically in the Control Cycle subject in the 2020 changes from the Actuaries Institute.

The textbook was essential for this unit. All pre-readings came from the textbook and "bookwork" questions in the exam were based on material from the textbook.

If you don't wish to purchase the textbook, some copies are available from the Curtin library. It could be a good idea to get it out and have a look through it before you start the semester. Perhaps ask someone in a lower year to borrow it for you if you no longer can because you are between degrees.

List of other learning materials

- » Lecture notes (PDF from PowerPoint).
- » Workshop and tutorial questions (PDF).
- » Various external resources and articles.

Usefulness of learning materials

The lecture notes were a summarised version of the textbook. They were useful for getting a condensed version of what was important. Things said by the lecturer in class were often much more insightful than the slides (the previous lecturer created them), so it was important to jot down some quick notes during class and review them when studying.

The tutorial questions could be considered exam standard and were useful for class discussion that helped ingrain the knowledge.

General comments

This unit had more calculations in it than [ACTL4000](#) but was equally as, if not more, challenging. It still involved a fair amount of rote learning and written application questions.

Margin on services liabilities were a source of confusion for many students and was fairly prominent in assessment (in both the presentation and the exam).

Industry knowledge

Computer languages and software

Software: Excel

Excel was used for the report and presentation assessments. Liabilities, profit and monitoring experience topics were taught through examples in Excel. The ability to build up a fund came up a lot.

Industry practice

The lecturer had considerable practical experiences in diverse range of actuarial roles. They provided examples from their career frequently, particularly in the professionalism section of the unit.

Topics were often linked to current events happening in the domestic and international economy. The newbrite was an example of this.

Links to other units

Useful knowledge from previous units

It more the approach taken rather than the topics covered that are useful in this unit compared to [ACTL4000](#).

Overlap with other units commonly taken concurrently

Topics on assets including investments and asset liability management are covered briefly in this unit while being taught in more detail in [ACTL4002](#).

Useful topics for future units

N/A

ACTL4002 Actuarial Asset Liability Management

Unit nickname	Previous unit name	
ALM	Actuarial Investments and Asset Modelling (2017)	
Challenge rating	Type of unit	Exemption
4.5	Compulsory unit for the actuarial science honours degree	This was previously an exemption unit under the old part II program but is now only designed to prepare students for the external asset liability management exam hosted by the Actuaries Institute.
Information based on	Availability	
Semester 2 2019	Semester 2 only	
Prerequisites for this unit...	This unit is a prerequisite for...	
STAT3006	Nil	

Reliability of information

The content in this unit may change as it is designed to prepare students for a new external course run by the Actuaries Institute (it is no longer used for exemption), the curriculum for said external course is also different to what it was before.

We suggest you check the [published unit outlines](#) for more information.

Syllabus/ Topics

Note that these may change in the new curriculum.

- » The economic balance sheet
- » Money market instruments, fixed interest securities
- » Property; equities
- » Overseas investments; derivatives; collective investment schemes
- » Economic influences; financial economics topics
- » Required return vs expected return; accounting bases
- » Discounted cashflow models
- » Comparing returns from asset classes
- » The 'matching' principle
- » Investment risk
- » Asset liability management

Assessments

Assessment name	Weighting
Group assignment	15%
Test	15%
Exam	70%

Performance in the test is strong indication of what the level to expect as well as how you will perform in the exam. You needed to know bookwork well in both and as the test was fairly late on in the semester, study for the test actually assisted with study for the exam. Both were what the lecturer called "exam standard".

The assignment was completed such that the entire class (of 6 people) was one group. The task was to research a particular technical modelling approach to forecast the financial position of company in order to determine capital requirements. This involved the use of both R and Excel.

Learning activities

Lectures, workshops and tutorials ran back-to-back...to-back in a 4-hour block. The order of them was sometimes switched but they were always distinctly different.

Lecture (2 hours)

In lectures, the lecturer presented material with a slideshow with a large amount of explanation. Discussion of the material was often prompted and encouraged (having a small class allowed this to happen quite easily).

Tutorial (1 hour)

In tutorials questions were completed as a group with one person writing on the board. It was expected that students had attempted the questions before the tutorial but further discussion of appropriate answers was had during the tutorial. The lecturer would assist if the everyone was struggling but generally let students come up with their own solution.

Attempting the questions beforehand was sometimes quite difficult as the tutorial was on the same day as the lecture and covered the same topic as the lecture.

Workshop (1 hour)

For the first half of semester, the workshop was time to work on the assignment with the lecturer there to help if needed. In the second half of semester, additional application questions were completed in a similar way to the tutorial.

iLectures Quality

None of the above learning activities were recorded.

Learning materials

Textbook

Textbook reference: "[Investment Principles for Actuaries](#)" by Fitzherbert

"[Financial institutions, instruments & markets](#)" by Viney

"[Money & Capital Markets Pricing, Yields and Analysis](#)" by Sherris

Textbook importance: essential

These textbooks were essential as weekly readings came out of these textbooks. At an honours level you are expected to do reading prior to attending each lecture as lectures involve far more discussion.

It did not matter which edition you had of Viney or Sherris, although having a more recent version is ideal. The only difference it makes is contextual information such as in versions of Viney that were released after 2010 reference the global financial crisis in examples.

The lecture slides, combined with supplementary information discussed during lectures, was sufficient for learning "bookwork" but additional context and explanations would be found in the three textbook.

Fitzherbert was the main textbook for this unit. It was more difficult to understand than the others (the lecturer also pointed this out). Fitzherbert made some interesting points at times but it was generally less useful than the other two.

Viney was a textbook that was favoured by the lecturer. It was quite easy to read and covered most of the topics that were covered in class. It was more of a general finance textbook that specifically for actuarial purposes so the maths in it was not very rigorous.

Sherris was used for only a small number of topics in this unit but did a good job of covering those that it did. Notation used in it was similar to actuarial notation which made things a little more consistent and familiar.

List of other learning materials

- » Lecture notes (PDF from PowerPoint).
- » Tutorial questions (PDF).
- » Various external resources and articles.

Usefulness of learning materials

The lecture notes, combined with supplementary detail delivered orally in lectures, made up the "bookwork" in this unit.

The tutorial questions were exam-standard application questions that proved useful for thinking as you would during the exam.

The additional reading materials provided some additional context and were often discussed in lectures and workshops.

General comments

This unit provides students with a new-found appreciation for a number of topics covered previous units in the first three years. The term structure of interest rates in particular is one that springs to mind. The key to this is providing context of how it all works in the real world and how various aspects of finance interact with each other.

It could be seen as a refreshing change from the far too frequent occurrence of units that provide and incoherent and dispassionate lists of seemingly unrelated topics (in spite of the fact that they really are related). This unit actually provides you with knowledge and critical thinking ability that you might apply in the real world and link concepts together in your mind.

Industry knowledge

Computer languages and software

Languages: R

Software: Excel

While Excel and R were not taught directly in this unit, they were used in the assignment.

Industry practice

This entire unit was an exercise in industry practice. The lecturer made sure that everything covered in this unit was highly important in industry and pointed out specifically how each topic was at each opportunity.

Topics were often links to current events happening in the domestic and international economy.

Links to other units

Useful knowledge from previous units

Some assets and asset liability management is covered at a basic level at the same time in [ACTL4001](#).

Overlap with other units commonly taken concurrently

There is an “assets” topic in [ACTL4001](#) which is commonly taken at the same time as this unit. Some of the content is similar although a slightly different perspective is taken in each.

Useful topics for future units

This unit will assist students with taking the Asset Liability Management course facilitated by the Actuaries Institute from 2020 onwards.

ACTL4004 Actuarial Risk Management

Unit nickname	Previous unit name	
N/A	N/A	
Challenge rating	Type of unit	Exemption
?	New compulsory honours unit in 2020	It is not known if this is an exemption unit or not. It could either be additional assistance (along with ACTL4002) for preparing for the new institute-delivered Asset and Liability Management subject or part of the university-delivered Actuarial Control Cycle subject or neither these things and just supplemental knowledge.
Information based on	Availability	
This is a new unit as at the date of publishing, we will endeavour to review it once it has been delivered for the first time	Semester 2 only	
Prerequisites for this unit...	This unit is a prerequisite for...	
ACTL4000	Nil	
Reliability of information		
This is a new unit at the time of release of this document. We have provided as much information as we can find without input from those who took the unit. We suggest you check the published unit outlines for more information.		

Syllabus/ Topics

- » Deeper approach to managing risks in an organisation
- » Risks in product design
- » Risks in liabilities
- » Modelling risks

Learning activities

Lecture (2 hours)

Tutorial (1 hour)

Workshop (1 hour)

Industry knowledge

Computer languages and software

Languages: R

Software: Excel

Links to other units

Useful knowledge from previous units

This unit is meant to build upon knowledge of risk developed in [ACTL4000](#)

Overlap with other units commonly taken concurrently

The discussion of risk is embedded within [ACTL4001](#) and [ACTL4002](#). This unit will thus complement the other two with its deeper focus on risk.

Useful topics for future units

N/A

Optional and Elective Units

1000 Units

COMP1002 Data Structures and Algorithms

Unit nickname		Previous unit name
DSA		N/A
Challenge rating	Type of unit	Exemption
3	Optional unit (although it is not on the list it has been negotiated by actuarial students in the past)	N/A
Information based on		Availability
Semester 2 2018		Both Semesters
Prerequisites for this unit...		This unit is a prerequisite for...
Nil		Nil
Reliability of information		
We suggest you check the published unit outlines for more information.		

Syllabus/ Topics

- » Sorting
- » stacks, queues and recursion
- » linked lists and iterators
- » binary search trees and some advanced trees
- » graphs and search methods
- » heaps
- » hash tables

Assessments

Assessment name	Weighting
Practicals	10%
Mid-Semester Test	20%
Assignment	20%
Final Examination	50%

There is a significant disparity between how easy the theory of this unit is and the time required for the coding aspects, such as the weekly practicals and the assignment. The theory is comparatively easy and makes up the majority of the written assessments. The practicals can be very time consuming particularly as the support for Python students in this unit is still being developed (the majority of students are computer science students who use Java).

Learning activities

Lecture (2 hours)

The lecturer ran two lectures, one for Java students (overwhelmingly computer science students) and one for Python students. Lectures were a thorough exploration of the associated theory, complete with detailed slides that include pseudo-code and code for both languages.

Computer Lab (1 hour)

Weekly practicals and associated UML diagrams were marked by tutors according to a known marking key at the start of each lab. They had a far more practical focus and tutors were often available to help investigate problems with code or guide your approach on your future practicals. However, tutors were predominantly computer science students who had limited exposure to Python.

iLectures Quality

Learning activities recorded: lecture

Teaching style lent itself to being recording: somewhat

The iLectures often had issues with camera movement and any diagrams the lecturer drew on the whiteboard. However, the theory could easily be understood through the detailed slides, the lecturer's clear descriptions and extensive online information.

Learning materials

Textbook

Snippets from certain texts focusing on the theory are provided via Blackboard. Otherwise most textbooks are created for Java students and are not applicable to Python students or required at all in anyway.

List of other learning materials

- » slides including pseudo-code and code
- » weekly practical worksheets
- » notes, such as UML style guide

Usefulness of learning materials

The UML style guide is absolutely essential to completely the weekly practical UML diagrams and tutors often consult it when marking if unsure.

The notes and other material made available on Blackboard specifically for Python students can definitely be useful, although more practical questions about specific code are often answered online through resources such as StackOverflow.

General comments

This unit is not recommended to anyone who is not confident in their programming ability as it is primarily core, first year Computer Science unit. The first few weeks are particularly challenging as the majority of the cohort have completed Object Oriented Program Design (COMP1001 or OOPD) which delves more deeply into Object Orientation and UML diagrams.

Industry knowledge

Computer languages and software

Languages: Python or Java

This unit will help to compound a base level familiarity with Python, including providing extensive practice thinking about how Object Orientation can be applied to various algorithms. It has limited practical advice, however, and does not directly cover packages or algorithms which are likely to be used in basic data analytics using Python.

Industry practice

None.

Links to other units

Useful knowledge from previous units

Object orientation and NumPy are more advanced concepts from [COMP1005](#) which are absolutely essential.

Overlap with other units commonly taken concurrently

N/A

Useful topics for future units

N/A

COMP1005 Fundamentals of Programming

Unit nickname	Previous unit name
FOP	N/A
Challenge rating	Type of unit
1	Optional Unit
Exemption	N/A
Information based on	Availability
Semester 1 2019 (edited from Semester 1 2018)	Both Semesters
Prerequisites for this unit...	This unit is a prerequisite for...
Nil	COMP1002
Reliability of information	
We suggest you check the published unit outlines for more information.	

Syllabus/ Topics

- » Strings and lists
- » Arrays and plotting
- » Multi-dimensional arrays
- » Files and grids
- » Scripts and automation
- » Data wrangling
- » Working with structured data
- » Modelling with objects
- » Objects and exceptions
- » Projects in Python

Assessments

Assessment name	Weighting
Worksheet Test	15%
Practical Test	15%
Assignment	20%
Final Examination	50%

The assignment in this unit required a reasonable amount of work to complete. The questions in the exam were quite similar to past exams. Note however that answers to practice exams were not provided.

Learning activities

Lecture (2 hours)

The lecturer read theory and extensive examples from the lecture slides. There was minimal class participation. Lecture examples were almost always useful in lab exercises.

Computer Laboratory (2 hours)

Weekly lab tutorials consisting of coding questions like the lecture examples. Copy pasting the code from lecture slides would answer most of the questions. Assessments worth a few percent of the course were held every few weeks. They were not under test conditions and students were able to ask for help.

iLectures Quality

Learning activities recorded: lecture

Teaching style lent itself to being recording: yes

iLecture quality is reasonably clear, and in conjunction with provided slides can be used to understand the content.

Learning materials

Textbook

No textbook was prescribed for this unit.

Usefulness of learning materials

- » Lecture slides
- » Practical exercises

General comments

This unit should cause actuarial students absolutely no trouble. It is run as a fundamentals course so there is no prior knowledge required. Students were required to submit the tutorials weekly and it is recommended to attend each tutorial to complete this with tutors help. Note that Curtin's computers or a computer with Linux were the easiest way to work in this unit.

Industry knowledge

Computer languages and software

Languages: Python

Software: Linux operating system

Industry practice

Python knowledge may prove useful in industry. The content covered in this unit, however, is quite basic and further units or projects involving the language would need to be undertaken to use this on a professional level.

Links to other units

Useful knowledge from previous units

N/A

Overlap with other units commonly taken concurrently

N/A

Useful topics for future units

Knowledge of python from this unit is important in [COMP1002](#) (unless you know Java).

STAT1003 Introduction to Data Science

Unit nickname	Previous unit name	
Data science	N/A	
Challenge rating	Type of unit	Exemption
2	Optional unit	N/A
Information based on	Availability	
Semester 1 2018	Semester 1 only	
Prerequisites for this unit...	This unit is a prerequisite for...	
Nil	Nil	

Reliability of information

The lecturer for this unit is likely to change in the next offering.

We suggest you check the [published unit outlines](#) for more information.

Syllabus/ Topics

- » Introduction to data science
- » Sources of data; getting and cleaning data
- » Visualisation:
 - ↳ Exploring data
 - ↳ Elements of visualization
 - ↳ Good/bad graphics
 - ↳ Grammar of graphics
 - ↳ Taxonomy for data graphics
 - ↳ Dissecting graphics
- » Big Data and Ethics
- » Data analysis:
 - ↳ Statistical foundations
 - ↳ Experimental and observational studies
 - ↳ Predictive and explanatory models
 - ↳ Simple linear regression
 - ↳ Multiple linear regression
 - ↳ Assessing predictive ability
 - ↳ Model diagnostics
 - ↳ Classification or prediction?
 - ↳ Methods for classification
 - ↳ Logistic regression
 - ↳ Methods of classification
- » Communication of data
- » Managing Data

Assessments

Assessment name	Weighting
Test 1	30%
Test 2	30%
Group assignment	40%

The group project consisted of a report and presentation on topic chosen by the group.

Learning activities

Lecture (1 hours)

The theory behind specific coding methods on r-studio was discussed. The lecture aided students in explaining the rationale behind certain coding and modelling techniques.

There was no exam, so the theoretical aspect of the unit is more for the student's understanding than for assessment purposes.

Computer Lab (1 hour)

As all assessments for this unit were based on R-studio. This made the computer lab very important. Attendance is highly recommended.

The solutions were uploaded every week and the lecturer explained the code. Alternative ways of achieving the same output was also often discussed.

The two hour length allowed students ample time to get through all the exercises and ask questions.

Workshop (1 hour)

Every week guest speaker in the field would come to talk about the work they do. It was interesting, depending on the speaker but wasn't assessed in any way.

Note that this has since been changed and a reflection on the speakers is now a part of the group assignment assessment as of 2019.

iLectures Quality

Learning activities recorded: lecture, workshop (only some, when the speaker consented)

Teaching style lent itself to being recording: yes

The iLectures were of good quality, the lecturer displayed everything in the slides and spoke into the microphone.

The guest speakers would sometimes ask for the iletecture to be turned off so not all of the "workshops" were available to view online.

Learning materials

Textbook

No textbook was prescribed for this unit.

List of other learning materials

- » Lecture notes (pdf)
- » Worksheets (rmd/ html)
- » Worksheet solutions (rmd/ html)
- » Pre-reading links (online web-address)

Usefulness of learning materials

The lecture notes and R worksheets were more than satisfactory for this unit.

General comments

The lecturer prepares you for the tests. Students are provided with previous tests to practice.

The lecturer also often threw in bonus questions, which made it easier to score well. Those who do [STAT1000](#) (or now [STAT1006](#)) prior to taking this unit are likely to find this unit comparatively easier.

Industry knowledge

Computer languages and software

Languages: R

Software: RStudio

Programming language R is covered in depth.

Industry practice

This unit gives a broader view on data and the extent to which it is present in industry.

Links to other units**Useful knowledge from previous units**

R was covered in a similar way in the first-year unit [STAT1000](#) (Regression and Non-Parametric Inference).

Overlap with other units commonly taken concurrently

N/A

Useful topics for future units

Knowledge of R is useful in any units that use it in future such as [STAT3001](#) and [MATH3005](#).

2000 Units

INDE2000 Supply Chain Modelling and Optimisation

Unit nickname	Previous unit name	
Supply/SC	N/A	
Challenge rating	Type of unit	Exemption
2	Optional	N/A
Information based on	Availability	
Semester 1 2018	Semester 1 only	
Prerequisites for this unit...	This unit is a prerequisite for...	
Nil	INDE2001 Logistics Modelling and Optimisation	

Reliability of information

We suggest you check the [published unit outlines](#) for more information.

Syllabus/ Topics

- » Concepts, Roles, Significance of logistics/Supply Chain Management
- » Supply Chain Optimization
- » Modelling Supply Chain/Logistics Networks
- » Inventory Management System; Inventory Models – Single Commodity, Deterministic Demand
- » Inventory Management Models with Discounts
- » Multi Commodity EOQ Models
- » Stochastic Inventory models: Single period/Single commodity models
- » Stochastic Inventory models: Multi-period models with no shortage and with a shortage
- » Concepts, Roles and Significance of Forecasting
- » Methods for Demand Forecasting: Moving Average method; Time Series and Exponential Smoothing Method
- » Demand Forecasting with Seasonal Variation: Winter's Method; Forecasting's Accuracy
- » Adaptive Control Models of Demand Forecasting

Assessments

Assessment name	Weighting
Assignment 1	15%
Assignment 2	15%
Mid-Semester Test	20%
Final Examination	50%

The course included 2 assignments that were graded. Both assignments were relatively simple and if enough case was taken, students could use it to boost their course mark.

Make sure to go through past exams and midsemester tests as not all questions that show up in the final exam will be fully explained or shown in great detail during the lecture.

The lecturer was helpful when it came to answering any assessment-based questions. Most assignment questions could be found online but one needed to be careful because sometimes there were different ways of doing each question that would yield different answers. Supplementary mid semester tests were provided for those who were performing poorly in the unit.

Learning activities

Lecture (2 hours)

Lectures were tedious and the volume of content would be hard to wade through on your own, luckily the lecturer would tell us what the relevant pieces of information were.

Tutorial (1 hour)

Students were provided with page of exam style questions which they can work through independently or with the lecturer. Solutions were provided in this class and online.

This was probably the most useful of the classes, but everything was also provided on blackboard.

Workshop (1 hour)

It was called a workshop, but it was actually a computer lab. We would be provided with a guide on how to answer questions based on the weeks work using excel.

Students worked on the exercises independently without much teaching from the lecturer.

It was helpful to attend this class for the assignments which are both take home and require excel. If you struggle or have specific questions it can be useful but overall it was not crucial if you're happy to go through the work yourself. Attendance for this class was generally low.

While they were not relevant for the tests or exams, they were relevant for an assignment. They were also useful in using functions in excel and solving logistical problems. Would recommend attending these labs.

iLectures Quality

Learning activities recorded: Lecture

Teaching style lent itself to being recording: somewhat

The iLecture quality was extremely poor in the semester this guide was written due to room booking issues.

Learning materials

Textbook

Textbook reference: [Introduction to Computational Optimization Methods for Production Planning in a Supply Chain](#) by Stephan Voß and David L. Woodruff

Textbook importance: useful

Most of the questions the lecturer used were taken out of the textbook so going through the textbook was quite useful. Most students found that the lecture slides were more than adequate however.

List of other learning materials

- » Lecture Slides (PowerPoint)
- » Worksheet exercise with separate solutions (Word)
- » Computer Lab Questions/Activities (Word)

Usefulness of learning materials

The lecture slides were sufficient for learning the content. Sometimes answers to exercises were wrong. The working out was also often not outlined in favour of just the final answer alone.

General comments

This unit is a prerequisite for Logistics Modelling and Optimisation which can be taken as an optional unit in the second semester of second year. Please note that in order to have an optional unit in second semester, Actuarial Economics must be selected as a first-year subject.

One might assume this was a theory-based unit and although there was a lot of theory taught it was mainly numerical concepts that were assessed.

Overall, this unit is fine if you put in a couple hours every week to understand how to use the formulas and do practice questions.

It helps to bud with someone through the unit, there were a number of incorrect solutions given.

Industry knowledge

Computer languages and software

Software: Excel

Excel was used during the computer labs and some assessments

Industry practice

Knowledge of supply chains and logistics can be useful in a business setting.

Links to other units

Useful knowledge from previous units

Lagrange multipliers from [MATH2009](#) (Calculus 2) are used in this unit as well.

Overlap with other units commonly taken concurrently

N/A

Useful topics for future units

[INDE2001](#) follows on from this unit.

INDE2001 Logistics Modelling and Optimisation

Unit nickname	Previous unit name	
Logistics	N/A	
Challenge rating	Type of unit	Exemption
?	Optional unit	N/A
Information based on	Availability	
Yet to be reviewed	Semester 2 only	
Prerequisites for this unit...	This unit is a prerequisite for...	
Nil	Nil	

Reliability of information

We are yet to receive a submission for this unit. If you have taken this unit recently, please help us out by contributing as directed in the link at the top right of the page.

We have provided as much information as we can find without input from those who took the unit.

We suggest you check the [published unit outlines](#) for more information.

Syllabus/ Topics

- » Modelling supply chain/ logistics networks
- » Warehouse logistics:
 - ↳ Structure and operations
 - ↳ Warehouse design
 - ↳ Product allocation
 - ↳ Operational issues
 - ↳ Optimisation algorithms
- » Facility location:
 - ↳ Optimal facility layout
 - ↳ Covering problems
 - ↳ P-centre problem
 - ↳ P-median problems

Assessments

Assessment name	Weighting
Assignment	24%
Test	26%
Examination	50%

Learning activities

Lecture (2 hours)

Tutorial (1 hour)

Workshop (1 hour)

Industry knowledge

Computer languages and software

None.

Links to other units

Useful knowledge from previous units

This unit follows on from its prerequisite unit, [INDE2000](#).

Overlap with other units commonly taken concurrently

N/A

Useful topics for future units

N/A

MATH2000 Network Optimisation

Unit nickname		Previous unit name
Network		N/A
Challenge rating	Type of unit	Exemption
1.5	Elective Unit	N/A
Information based on		Availability
Semester 2 2018		Semester 2 only
Prerequisites for this unit...		This unit is a prerequisite for...
Nil		Nil
Reliability of information		
We suggest you check the published unit outlines for more information.		

Syllabus/ Topics

- » Elementary graph theory and algorithms
- » Graph factorisation
- » Vertex and edge colourings
- » Maximum flow problem
- » Matching in graphs
- » Network routing
- » Network connectivity
- » Project management

Assessments

Assessment name	Weighting
Assignment	20%
Test	30%
Examination	50%

Learning activities

Lecture (2 hours)

The lecturer went through lecture slides (provided) and worked examples (solutions only available if you watch the iletecture).

Tutorial (1 hour)

In tutorials, students attempted questions on whiteboards.

Workshop (1 hour)

Workshops were a continuation of the lecture and were recorded. Attendance for these classes was usually very low however the quality of the iletecture for these classes was poor so if examples were discussed on a white board these could not be interpreted from the iletecture. These examples were not key to understanding content and didn't affect any understanding.

iLectures Quality

Learning activities recorded: Lecture, workshop

Teaching style lent itself to being recording: Yes

For the lectures, the iLecture was of a high quality iLecture. Any examples were done on paper and all working out could be seen on the displays. The lecturer was clear and relatively easy to understand even on 2x speed. The workshop iLecture was of a lower quality. It was essentially just the lecture slides with commentary, any examples drawn on the whiteboards could not be interpreted, this may have been due to the venue.

Learning materials

Textbook

Textbook importance: essential

This textbook was written by a Curtin University lecturer and it was simply given to all students (no need to purchase it). It contained all of the relevant notes and questions for this unit. It also had some additional notes and questions that were not covered in this unit. Although some of the notes were fairly hard to understand, all relevant content was explained by the lecturer during the lectures.

List of other learning materials

- » Lecture Slides (ppt)
- » Textbook (PDF)
- » Solutions to exercises (PDF)

Usefulness of learning materials

No other resources are required for the unit, although students may want to research additional information for assignments.

General comments

This unit was a pretty straightforward and did not require strong mathematical ability. It consisted mainly of problem solving questions using basic maths and despite being given a lot of theory context, this it is not usually assessed. This unit could be seen as a CWA booster.

Industry knowledge

Computer languages and software

None.

MATH2010 Linear Algebra 2

Unit nickname	Previous unit name
Linear	Linear Algebra (2016)
Challenge rating	Type of unit
3	Optional unit
Information based on	Exemption
Semester 2 2019 (Same as Semester 2 2017)	N/A
Information based on	Availability
Semester 2 2019 (Same as Semester 2 2017)	Semester 2 only
Prerequisites for this unit...	This unit is a prerequisite for...
MATH1015 or MATH1017 MATH1016 or MATH1018	INDE3000 STAT3003 (no longer available)
Reliability of information	
We suggest you check the published unit outlines for more information.	

Syllabus/ Topics

- » Fields and vector spaces
- » Subspaces
- » Linear dependence and span
- » Bases and dimensions
- » Coordinates
- » Row and columns spaces
- » Affine varieties
- » Sum and intersection of subspaces
- » Linear transformations
- » Change of Coordinates
- » Orthogonal/ orthonormal bases, Orthogonal matrices and the Gram-Schmidt process
- » Inner products
- » Complex matrices and the Hermitian product
- » Least squares
- » Eigenvalues and eigenvectors
- » Cayley-Hamilton theorem
- » Diagonalisation of Matrices
- » Linear systems of differential equations
- » Jordan canonical form
- » Symmetric matrices
- » Spectral theorem
- » Quadratic forms
- » Singular value decomposition
- » Generalised inverses

Assessments

Assessment name	Weighting
Quizzes (3)	15%
Test	35%
Exam	50%

In all assessments, we were provided with more than enough time and arithmetical calculations were simple meaning this unit really focused on assessing your understanding of the content.

Learning activities

Lecture (2 hours)

The lecturer went through lecture material, writing notes and examples on the whiteboard. The material was explained with a high degree of clarity and with no “hand waving” (everything was explained fully). The lectures were quite full-on in terms of content but very worthwhile attending and concentrating in.

Tutorial (1 hour)

In tutorials we were provided with questions which we did on our own or in groups. The lecturer would roam around, providing assistance where it was required. There were also intermittent collaborative assessments which were held in the tutorial classes every few weeks.

Workshop (1 hour)

In the workshops, the lecturer went through examples on the board. The questions were released before the workshops, so students had the opportunity to attempt them beforehand.

iLectures Quality

Learning activities recorded: Lecture

Teaching style lent itself to being recording: no

The notes on the whiteboard were not always legible on the recording. It was advantageous to attend.

Learning materials

Textbook

No textbook was prescribed for this unit.

List of other learning materials

- » Lecture notes (typed pdf/ LaTeX document)
- » Tutorial Questions
- » Workshop questions

Usefulness of learning materials

All the questions provided were very good practice for assessments often specifically designed to help with assessments.

The notes were thorough and rigorous, but some people found them a bit too mathematical to follow. Taking down the handwritten notes in the lectures provided an adequately condensed version of the lecture notes. Extensive study from the provided lecture notes was by no means required to perform well in this unit, however they were useful and indeed interesting for those who are particularly mathematically inclined.

General comments

In this unit each new topic built upon previous topics.

This unit was taught from the point of view of a pure mathematician. Those who appreciate mathematics will enjoy this unit. You gain a mathematically rigorous understanding of many mathematical tools that you may have previously taken for granted.

The lecturer ran extra revision classes before the tests and exam which were very useful, the lecturer was keen for us to succeed.

All this being said, many students struggled with this unit, probably owing to the need for a strong conceptual understanding. This is quite the opposite of a “hack” unit.

Industry knowledge

Computer languages and software

Although no computer languages are directly used in this unit, this unit can provide one with a greater understanding of vectors and arrays. In particular, the R language is designed for vector and array operations.



Industry practice

None.

Links to other units**Useful knowledge from previous units**

[MATH1015](#) (Linear Algebra 1) or equivalent is assumed knowledge in this unit and knowledge from this is used from the get-go. A non-compulsory revision lecture is run in the first week as a refresher.

If you did [MATH1017](#) and [MATH1018](#) (Accelerated Mathematics), you may have done a number of the topics covered in this unit already.

Least squares was taught in [STAT1000](#) but it is likely this unit will give one a better retrospective understanding of least squares than [STAT1000](#) being useful knowledge.

Overlap with other units commonly taken concurrently

N/A

Useful topics for future units

N/A

MATH2011 Operations Research

Unit nickname	Previous unit name
O.R.	N/A
Challenge rating	Type of unit
2	Optional
Exemption	N/A
Information based on	Availability
Semester 1 2018	Semester 1 only
Prerequisites for this unit...	This unit is a prerequisite for...
MATH1015 or MATH1017 MATH1016 or MATH1018	Nil
Reliability of information	
We suggest you check the published unit outlines for more information.	

Syllabus/ Topics

- » The nature of operations research (OR)
- » Linear programming (LP) models and optimization problems
- » Two variable LP problems
- » Basic theory of linear systems
- » The simplex algorithm of LP
- » Duality
- » Sensitivity analysis
- » The transportation problem
- » Network analysis
- » Quadratic programming
- » Games theory

Assessments

Assessment name	Weighting
Take home exercises	15%
Test	25%
Final Exam	50%
Tutorial Portfolio	10%

Learning activities

Lecture (2 hours)

The lecturer excellent at explaining the methods behind the theory in order to enhance student's understanding of the content.

Tutorial (1 hour)

Workshop (1 hour)

In the workshop we went through past exam questions together which prepared us well for the exam.

iLectures Quality

Learning activities recorded: Lecture

Teaching style lent itself to being recording: No

The lecture quality was poor due to heavy use of the whiteboard by the lecturer. The camera didn't follow and zoom correctly. However, the lecture notes were sufficient to fill the gaps in the lecture.

Learning materials

Textbook

No textbook was prescribed for this unit.

List of other learning materials

- » Lecture notes
- » Supplementary notes

Usefulness of learning materials

The lecture notes were incredible, with fully worked and explained examples.

General comments

The workload for this unit was manageable and content was taught well.

Industry knowledge

Computer languages and software

None.

Industry practice

None.

Links to other units

Useful knowledge from previous units

Basic calculus and linear algebra from first year maths units

Overlap with other units commonly taken concurrently

Lagrange multipliers are also used in [MATH2009](#).

Useful topics for future units

N/A

MATH2015 Mathematical Computing

Unit nickname	Previous unit name
Computing	N/A
Challenge rating	Type of unit
2	Optional unit
Exemption	N/A
Information based on	Availability
Semester 1 2017	Semester 1 only
Prerequisites for this unit...	This unit is a prerequisite for...
MATH1015 or MATH1017 MATH1016 or MATH1018	Nil
Reliability of information	
This unit has not been reviewed for 2 years.	
We suggest you check the published unit outlines for more information.	

Syllabus/ Topics

- » Arithmetic computations
- » Control Structures
- » Data types and array processing
- » Formatted input/output
- » Subprograms and program design
- » Direct methods for solving linear systems
- » Numerical methods for solving nonlinear equations
- » Interpolation and polynomial approximation
- » Numerical integration

Assessments

Assessment name	Weighting
Test	20%
Practical exercises	30%
Exam	50%

In tests and exams it is advisable to make sure your notes are detailed and contain every formula you aren't 100% sure you know.

Most questions in this unit were standard so if you knew the content you were likely to score well.

The practical exercises assessment was not done in 2017, when this unit was reviewed.

Learning activities

Lecture (2 hours) and Workshop (1 hour)

In both lectures and workshops, the material was delivered by way of a PowerPoint. The lecturer would also go through some example questions in the lecture (the solutions to these were uploaded later). It must be said that the lectures didn't particularly add much to the lecture notes themselves. Depending on your style of learning you may find it easier to simply read the notes.

Practical/ computer lab (1 hour)

In the computer labs we were given exercises in Fortran to complete. The lecturer would give assistance to those who needed it. It is also presumed the practical exercises assessment is now facilitated in practicals but this was not a part of assessment at the time the reviewer took the unit.

iLectures Quality

Learning activities recorded: Lecture, workshop

Teaching style lent itself to being recording: Yes

The iLecture quality was reasonable considering the lecturer only rarely wrote things on the board and most of that was solutions to problems which were uploaded later anyway.

Learning materials

Textbook

No textbook was prescribed for this unit.

List of other learning materials

- » Lecture notes/slides in a pdf with solutions posted after the lecture.
- » Practical exercises to be done in Fortran.

Usefulness of learning materials

The lecture notes were quite thorough and could be used to study without the need to attend lectures if required.

General comments

If you have done programming before, the first few weeks covering the basics of programming will be very straight forward for you.

Industry knowledge

Computer languages and software

Languages: Fortran

Programming language Fortran used in this unit. This unit will teach you the basics of programming if you have not previously learnt them in a way that you may apply to other languages. Fortran is however quite an archaic language and not commonly used in industry. It is however still commonly used for large scale numerical calculations due to its efficiency.

Industry practice

Numerical methods are commonly used in industry since analytical solutions are not always (even seldom) possible in practice. This unit provides one with a solid conceptual understanding of these methods which gives one more confidence when applying the algorithms in practice. The value of understanding these methods beyond a black box approach should not be overlooked.

Links to other units

Useful knowledge from previous units

Any previous programming units would be useful.

This unit relies heavily on content from the mathematical prerequisites for this unit.

If you did [MATH1017](#) and [MATH1018](#) (Accelerated Mathematics), you will have encountered some of the theorems that underpin numerical methods already.

Overlap with other units commonly taken concurrently

N/A

Useful topics for future units

This unit will provide one with an actual understanding of numerical methods which are covered (in little to no detail) in [MATH2005](#).

STAT2003 Analytics for Experimental and Simulated Data

Unit nickname	Previous unit name	
EDA	STAT2000 Experimental Design and Analysis (2017)	
Challenge rating	Type of unit	Exemption
2	Optional unit	N/A
	Compulsory unit in for the applied statistics third year stream from 2022 onward.	
Information based on	Availability	
Semester 2 2017	Semester 2 only (2020 and prior) Semester 1 only (2021 onward)	
Prerequisites for this unit...	This unit is a prerequisite for...	
STAT1000	STAT2004	

Reliability of information

This unit has undergone significant changes since this guide was written, coinciding with a change in the unit name.

We suggest you check the [published unit outlines](#) for more information.

Syllabus/ Topics

- » Experimental designs
- » ANOVA
- » Contrasts and multiple comparisons
- » Completely randomized design
- » Randomised block designs and analysis
- » Latin square designs and analysis
- » Factorial method of experimentation
- » Response surface method and optimal designs
- » Designs for computer simulated experiments
- » Meta models for computer simulated experiments

Assessments

Assessment name	Weighting
Test	10%
Assignment 1	20%
Assignment 2	20%
Examination	50%

Learning activities

Lecture (2 hours)

The lecture and workshop were conducted together, and it was encouraged you bring a laptop or similar device during class to follow along with the lecturer. Attendance was not assessed but participation was. Speaking up here and there was sufficient.

Tutorial (1 hour)

Computer Lab (2 hour)

Students were given a worksheet to complete during class and if you were stuck, the lecturer was able to help. The lecturer did not go through the worksheet in front of the class. The majority of it was independent work.

iLectures Quality

Learning activities recorded: Lecture

Teaching style lent itself to being recording: Somewhat

The iLectures were of poor visual quality but acceptable audio quality.

Learning materials

List of other learning materials

- » Lecture note pack-pdf
- » Workshop sheets-pdf
- » Datasets for workshops

Usefulness of learning materials

The lecture notes were good for learning on your own. We were not provided with solutions to the workshop sheets.

General comments

N/A

Industry knowledge

Computer languages and software

Languages: R

Software: RStudio

Used at an intermediate level.

Industry practice

None.

Links to other units

Useful knowledge from previous units

Linear regression from [STAT1000](#).

Overlap with other units commonly taken concurrently

N/A

Useful topics for future units

N/A

3000 Units

INDE3000 Industrial Modelling and Optimisation

Unit nickname		Previous unit name	
N/A		N/A	
Challenge rating	Type of unit	Exemption	
?	Optional unit	N/A	
Information based on		Availability	
Yet to be reviewed		Semester 1 only	
Prerequisites for this unit...		This unit is a prerequisite for...	
MATH2011 MATH2010		Nil	

Reliability of information

We are yet to receive a submission for this unit. If you have taken this unit recently, please help us out by contributing as directed in the link at the top right of the page.

We have provided as much information as we can find without input from those who took the unit.

We suggest you check the [published unit outlines](#) for more information.

Syllabus/ Topics

- » Integer Programming
- » Better formulations and pre-processing
- » Linear programming and dual simplex algorithm
- » Branch-and-Bound algorithms

Assessments

Assessment name	Weighting
Assignment	20%
Test	30%
Exam	50%

Learning activities

Lecture (3 hours)

Tutorial (1 hour)

Learning materials

Textbook

No textbook was prescribed for this unit.

Industry knowledge

Computer languages and software

None.

Industry practice

None.

Links to other units

Useful knowledge from previous units

N/A

Overlap with other units commonly taken concurrently

N/A

Useful topics for future units

N/A

INVE3000 Introduction to Derivative Securities

Unit nickname	Previous unit name
Derivatives	N/A
Challenge rating	Type of unit
?	Optional
	Exemption
	N/A
Information based on	Availability
Yet to be reviewed	Both Semesters
Prerequisites for this unit...	This unit is a prerequisite for...
FNCE2000 Introduction to Finance Principles	Nil
MATH2009 Calculus 2	
Reliability of information	
We are yet to receive a submission for this unit. If you have taken this unit recently, please help us out by contributing as directed in the link at the top right of the page.	
We have provided as much information as we can find without input from those who took the unit.	
We suggest you check the published unit outlines for more information.	

Syllabus/ Topics

- » Introduction and securities markets
- » Risk and return measurement
- » Optimal asset allocation
- » Capital market equilibrium
- » Market efficiency and behaviour finance
- » Fixed-income securities
- » Equity security analysis
- » Options markets
- » Futures markets
- » Portfolio performance evaluation

Assessments

Assessment name	Weighting
Assignment 1	25%
Mid Semester Test	25%
Final Examination	50%

Learning activities

Lecture (2 hours)

Tutorial (1 hour)

Learning materials

Textbook

Textbook reference: [The fundamentals of futures and options markets](#) by John Hull

Textbook importance: required

Industry knowledge

Computer languages and software

None.

Industry practice

Further understanding of derivatives would be particularly beneficial for those seeking employment in roles which work more closely with these instruments e.g. options trader, investment banker.

Links to other units**Useful knowledge from previous units**

N/A

Overlap with other units commonly taken concurrently

This unit has significant overlap with [STAT3007](#) Investment Science 2. The approach taken however, is far less mathematically rigorous.

Useful topics for future units

N/A

INVE3001 Portfolio Management

Unit nickname	Previous unit name
N/A	N/A

Challenge rating	Type of unit	Exemption
?	Optional Unit	N/A

Information based on	Availability
Yet to be reviewed	Both Semesters

Prerequisites for this unit...	This unit is a prerequisite for...
FNCE2000 (Introduction to Finance Principles) MATH2009 (Calculus 2)	Nil

Reliability of information

We are yet to receive a submission for this unit. If you have taken this unit recently, please help us out by contributing as directed in the link at the top right of the page.

We have provided as much information as we can find without input from those who took the unit.

We suggest you check the [published unit outlines](#) for more information.

Syllabus/ Topics

- » Introduction and securities markets
- » Risk and return measurement
- » Optimal asset allocation
- » Capital market equilibrium
- » Market efficiency and behavioural finance
- » Fixed-income securities
- » Equity security analysis
- » Options markets
- » Futures markets
- » Portfolio performance evaluation

Assessments

Assessment name	Weighting
Mid-semester test	25%
Group report	35%
Final examination	40%

Learning activities

Lecture (2 hours)

Tutorial (1 hour)

Workshop (1 hour)

Learning materials

Textbook

Textbook reference: [Investments](#) by Bodie, Z. , A. Kane, and A.J. Marcus

Industry knowledge

Computer languages and software

None.

Industry practice

None.

Links to other units

Useful knowledge from previous units

N/A

Overlap with other units commonly taken concurrently

N/A

Useful topics for future units

N/A

MATH3000 Mathematical Methods

Unit nickname	Previous unit name
Maths Methods	N/A
Challenge rating	Type of unit
3	A possible elective for those in the applied statistics major
Exemption	
N/A	

Information based on	Availability
Yet to be reviewed	Semester 1 only

Prerequisites for this unit...	This unit is a prerequisite for...
MATH2009 Calculus 2	Nil

Reliability of information

We are yet to receive a submission for this unit. If you have taken this unit recently, please help us out by contributing as directed in the link at the top right of the page.

We have provided as much information as we can find without input from those who took the unit.

We suggest you check the [published unit outlines](#) for more information.

Syllabus/ Topics

- » Complex analysis
- » Laplace transforms
- » Special functions
- » Generalised functions
- » Sturm-Liouville systems
- » Green's functions

Assessments

Assessment name	Weighting
Assignment 1	16%
Assignment 2	10%
Test	24%
Examination	50%

Learning activities

Lecture (3 hours)

Computer Lab (1 hour)

Learning materials

Textbook

No textbook was prescribed for this unit.

Other learning materials

Lecture notes (pdf/LaTeX document, hard copy provided)

Worked Examples (pdf/LaTeX document)

Industry knowledge

Computer languages and software

None.

Industry practice

None.

Links to other units

Useful knowledge from previous units

If you took Accelerated mathematics 1 and 2 in first year, you were at an advantage in this unit. Methods of proof, linear properties, limits, trigonometric identities and mathematical notation were used in this unit (they were revised but likely something of a learning curve for those who took Linear Algebra 1 and Calculus 1).

Partial fractions from first year maths unit was used in this unit. The "cover the factors" method taught in accelerated mathematics was preferred.

Complex numbers from first year maths were used heavily in the complex analysis part of this unit. Finding zeros of complex polynomials, polar form of complex numbers and properties of complex number (including modulus, argument, conjugate etc.) were all used constantly. Again, students who took accelerated mathematics were at an advantage here as they covered these topics in more detail.

Integration techniques (in particular integration by parts, "tabular" integration, trigonometric integrals, etc.) from first year maths were used heavily throughout this unit.

Linear differential equations (both first and second order), as well as the ideas behind partial differential equations, variation of parameters, and Fourier series were all useful topics from Calculus 2 for Sturm-Liouville problems.

Overlap with other units commonly taken concurrently

N/A

Useful topics for future units

N/A

MATH3001 Applied Mathematical Modelling

Unit nickname	Previous unit name	
N/A	N/A	
Challenge rating	Type of unit	Exemption
?	Optional unit	N/A
Information based on	Availability	
Yet to be reviewed	Semester 2 only	
Prerequisites for this unit...	This unit is a prerequisite for...	
MATH2009 Calculus 2	Nil	

Reliability of information

We are yet to receive a submission for this unit. If you have taken this unit recently, please help us out by contributing as directed in the link at the top right of the page.

We have provided as much information as we can find without input from those who took the unit.

We suggest you check the [published unit outlines](#) for more information.

Syllabus/ Topics

- » Newton's law
- » Suffix notation and tensor operations
- » Stress equations of motion
- » Rate of strain tensors and constitutive equations
- » Fluid dynamics
- » Mathematical modelling of fluid flows
- » Mathematical modelling of heat transfer
- » Convection-diffusion process and application
- » Mathematical models in Black-Scholes option prices

Assessments

Assessment name	Weighting
Mid – Semester test	30%
Assignment	20%
Final Examination	50%

Learning activities

Lecture (2 hours)

Tutorial (1 hour)

Workshop (1 hour)

Learning materials

Textbook

No textbook was prescribed for this unit.

Industry knowledge

Computer languages and software

Industry practice

None.

Links to other units

Useful knowledge from previous units

N/A

Overlap with other units commonly taken concurrently

N/A

Useful topics for future units

N/A

4000 Units

STAT4002 Introduction to Applied Statistics

Unit nickname	Previous unit name	
Spatial Statistics	N/A	
Challenge rating	Type of unit	Exemption
3	Previously negotiated as an option for honour students in the past (this may not be possible in future given they have removed honours optional units)	N/A
Information based on	Availability	
Semester 1 2019	Semester 1 only	
Prerequisites for this unit...	This unit is a prerequisite for...	
Nil	Nil	

Reliability of information

This unit was something of a special offer. There is no guarantee it will be run again in future, particularly in the way it was in semester 1 2019. It was completely different to the unit described in the [unit handbook](#). It was a unit in spatial statistics and was only run as "Introduction to Applied Statistics", for bureaucratic reasons and is more accurately described as "spatial statistics".

We suggest you check the [published unit outlines](#) for more information (note that no unit outline was published in 2019).

Syllabus/ Topics

- » Spatial Data
- » Point Patterns as random processes
- » Spatial interpolation
 - ↳ Inverse distance weighting
 - ↳ Kernel Smoothing
 - ↳ Kriging
- » Fitting parametric models to data
- » Point process models
- » Poisson Point processes
 - ↳ Properties
 - ↳ Statistical estimation and inference
- » Dependence between points in point patterns
 - ↳ Distance methods
 - ↳ Monte- Carlo tests
- » The K-function
- » Cluster process models
- » Matérn cluster models
- » Thomas process
 - ↳ Matérn's inhibition models
- » Variance "tricks"
 - ↳ Delta method
 - ↳ Variance-stabilising transformations
- » Gibbs models
 - ↳ Strauss process
 - ↳ Fitting Gibbs models
- » Markov chains with applications in spatial statistics

Assessments

Assessment name	Weighting
Individual notes	27.5%
Group notes	27.5%
Assignment	45%

The assessments for this units were generally quite manageable. The “notes” assessments required students to submit their notes for a few weeks of semester’s lectures. The first one was an individual submission and the second was done in pairs. The assignment was a spatial data investigation that was quite open-ended. It allowed students to explore the data for themselves using techniques learnt in class.

Learning activities

Lecture (3 hours)

Lectures ran for 3 hours and were effectively a combination of a lecture and a computer lab. In the lecture component, the lecturer would provide clear explanations while taking notes on the whiteboard. Students were expected to take notes and part of the assessment in the unit was submitting your notes to the lecturer.

The computer labs were run in R and were based on the material covered in the lecture. They focussed primarily on use of the R package ‘spatstat’. Students were expected to use their own laptops with R downloaded on them.

iLectures Quality

Learning activities recorded: Lecture

Teaching style lent itself to being recording: No

Several whiteboards were used by the lecturer and only one was recorded. The general success of the iLecture depends on room.

Learning materials

Textbook

Textbook reference: [Spatial point patterns : methodology and applications with R](#), by Baddeley, Rubak and Turner.

Textbook importance: useful

Notes taken in the lectures were sufficient but the textbook was useful for extra inspiration in the assignment.

List of other learning materials

- » Computer lab worksheets (PDF/ LaTeX document, physical copy handed out)

Usefulness of learning materials

The computer labs were useful exercises to look back at when doing the assignment.

There were also notes written up on the board by the lecturer. These were highly useful but were not uploaded.

General comments

There was no exam in this unit and the workload was quite manageable. It focussed on applying standard statistical techniques to spatial statistics, which have historically been treated as separate.

While proofs were seldom covered, a deep understanding of the concepts was achieved through the method of teaching. It provided new insight into topics learned in previous statistics units.

This was a very interesting unit and worth taking if you can, provided it is offered in the same way in future. It might be the case that no actuarial students are now eligible to take it now which would be unfortunate.

Industry knowledge

Computer languages and software

Languages: R

The R language was used in this unit. As the lecturer developed an R package, interesting information on the philosophy and intuition behind R packages was discussed. Far more about R as a language was discussed in this unit, than you would encounter in a typical unit that uses R at Curtin.

Industry practice

A broader understanding of how to apply statistics to unfamiliar areas.

Links to other units

Useful knowledge from previous units

Previous knowledge of probability distributions, particularly the Poisson distribution but also some others was useful from and [STAT1001](#) and [STAT2001](#).

Understanding of moments and variance from [STAT2001](#).

Markov chains and stochastic processes from [STAT3005](#) Stochastic Processes were useful.

Overlap with other units commonly taken concurrently

N/A

Useful topics for future units

N/A

Research Projects

Third Year Industrial Project (MATH3004)

Students in the actuarial and applied statistics stream are required to undertake an industrial project. Actuarial science stream students can also take it as an optional unit if they wish. We suggest you consult the [published unit outlines](#) for more information.

We are yet to receive a submission for this unit and as such we have omitted any sections that require the input of someone who has taken the unit. If you have taken this unit recently and would like to contribute to the guide, please get in touch with us as directed in the link in the top right of each page. While it is not exactly the same some of the information on the [honours dissertation](#) below might prove useful for those taking the industrial project.

Honours Dissertation (STAT4004 and STAT4001)

In addition to course work (units that provide exemption from the [Actuary Program](#)) Actuarial Science Honours students must complete a research project (dissertation) that spans the entire year. This is done through two units, STAT4004 Actuarial Science Honours Dissertation 1 (replacing STAT4000 in 2020) and STAT4001 Actuarial Science Honours Dissertation 2. Consult the [published unit outlines](#) for [STAT4000](#), [STAT4001](#) and [STAT4004](#) for more information.

Note that the writer of this section did STAT4000 (25 credit points), which has now been replaced by STAT4004 (50 credit points). Apart from the change in credit points, little is expected to have changed.

How the dissertation is assessed

Students complete STAT4004 in the first semester where a project proposal is completed and given a pass/fail grade (it does not contribute to your course weighted average). In STAT4001, taken in second semester, you will receive a final grade based on your final project comprising of project management (10%), report (70%) and presentation (20%).

The project proposal will end up being half final report as it includes all the same sections (research questions, literature review, methodology etc.) except for the results and the conclusion. Students will be required to produce a draft report in the middle of semester so you should have obtained most of your results at this point. This draft version is worth 0% of your final grade however and is only for feedback purposes. While the proposal and draft will be marked by your supervisor (with feedback), the final report and presentation will be marked by other academics/lecturers.

One's performance in the honours dissertation is a strong contributor to the [class of honours](#) (e.g. First Class Honours) one receives.

Choosing your topic

You will have the opportunity to choose your own topic and supervisor. These are incredibly decisions as once you have made them, you will be stuck with them for the entire year.

You have the freedom to choose any topic you like as long as it is relevant to actuarial science. This quite a broad umbrella given actuarial science combines aspects of statistics, mathematics, finance, economics and computing. A good first step is to think back to the units you have taken so far and which ones you found the most interesting. While a specific project idea might not spring to mind straight away it could help you narrow it down further so it is easier to ask for help.

When looking for a supervisor you should try to find a lecturer you know and like already. You should also consider whether their research interests align with the topics you are interested in. Some supervisors may also assist you with choosing a more specific topic if you provide them with a more general area of interest.

There are often organisations that offer scholarships to do research in a particular field (e.g. agriculture or mining). In addition to the monetary incentives, this can suit some people quite well as they are likely to be provided with a lot of guidance and scope for what must be done in their project. There are pitfalls with this as well however as there can often be unforeseen challenges (e.g. obtaining data) and there will be expectations on you to produce work that adds value.

You can also use the topic you choose to help you learn or delve more deeply into a particular skill. For example:

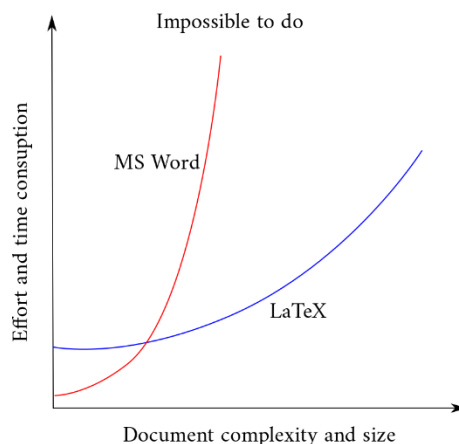
- » Choosing a topic that requires a lot of data visualisation, analysis and visualisation might allow you to further develop your R or Python programming skills.
- » You might choose a topic related to machine learning to learn more about that area.
- » If you aspire to work in a particular industry (e.g. general insurance), you might want to choose a topic that related to that industry.

Using LaTeX to write your dissertation

While your immediate thought might be to use Microsoft Word to write your project proposal and report, this is not necessarily the optimal choice. LaTeX is the program used by the majority of mathematical researchers. LaTeX is worth learning, particularly if your report contains a considerable amount of mathematics.

If you look up “LaTeX vs. Word”, you might find a [study](#) that suggests that Word is in fact better for productivity. This study has been [criticised](#) by due to its lack of attention to tasks that are actually required when writing a research paper. The study also admits that mathematical equations in LaTeX are vastly superior. The key here is what they are used for.

Word works fine for short and simple documents but becomes unstable and frustrating to use once you begin working on longer, more complex documents (such as an honours dissertation with a significant amount of mathematics). This is where LaTeX’s performance shines through.



In its purest form, LaTeX is an input-output system where you write ‘code’ in a .tex file and then compile it to produce a .pdf file. For those who have only ever used a “what you see is what you get” (WYSIWYG) word processors such as MS Word, LaTeX might prove unintuitive at first. However, the initial time it takes to learn will pay dividends in the long run. While you often need to click through several menus to perform certain tasks in Word, in LaTeX everything is done using the keyboard, by typing out commands.

Many of the mathematics and statistics lecturers and academics are familiar with LaTeX and your supervisor may even encourage you to use it. It is also possible that your supervisor will not know it (particularly if they are one of the actuarial staff) but you should not let this discourage you. If you have never used it before, it is still possible to learn and you will thank yourself later if you use it from the very beginning.

[Here](#) is a LaTeX template for formatting your paper (assuming the requirements for formatting are the same as they were in 2019).

Getting started with LaTeX

Unlike Word, LaTeX is free and open source. There are actually multiple ways to get it set up on your computer, we provide two recommended ways here:

Local installation (distribution and editor): you need two things, a TeX distribution (<https://www.latex-project.org/> recommends [MikTeX](#) for Windows, [MacTeX](#) for Mac, [TeXLive](#) for Linux) and a LaTeX editor ([TeXStudio](#) recommended). You can then create and edit LaTeX documents on your local drive.

Having a LaTeX distribution installed locally on your machine has the added benefit of allowing you to knit to pdf in RMarkdown. Note that there is another distribution called [TinyTeX](#) that is a little bit smaller and specifically created for use with RMarkdown.

There are many editors out there and if you have a preferred language-agnostic text editor for coding such as Vim or Sublime Text, it is possible to set it up for LaTeX.

There is an extensive list of LaTeX editors in this [Stack Exchange post](#) if you are looking to investigate your choice further.

Through a browser (Overleaf): go to <https://www.overleaf.com/register> and create a free Overleaf account. Once you have done this, you will immediately be able to start creating and editing your very own LaTeX documents through your browser on the cloud.

This method does not require you to install a TeX distribution but you may wish to anyway as a backup in case the Overleaf servers are down. Some Overleaf users have no idea how to compile locally, don't be one of these people.

This method will allow you to pick up where you left off on any computer (just log in). This is pretty handy since Curtin's computers (with the exception of the office computers of some academics) do not have LaTeX installed.

Overleaf also has a paid version that allows you to collaborate with others.

Overleaf has millions of users worldwide and thousands of templates. Some external websites even have an option to open LaTeX source code in Overleaf.

Once you get it installed, here are some resources for learning how to use LaTeX:

- » [The not so short introduction to LaTeX2e](#) is commonly cited a great resource for learning LaTeX.
- » The Curtin Student Actuarial Society ran a LaTeX workshop in 2019 and still have the materials up on their website at <https://www.curtinactuary.com/latex-workshop/materials> at the time of writing.
- » There are a number of tutorials on YouTube for learning LaTeX, [the one by Michelle Krummel](#) is one of the better ones out there, it is well-delivered and comprehensive. Bear in mind however, that some of the ways of doing things shown in this series of tutorials are not considered best practice (e.g. using eqnarray instead of align).
- » Overleaf has a number of excellent tutorials on specific topics on their website.

To prepare yourself for writing your academic paper, pay particular attention to learning the following topics in LaTeX:

- » Document basics such as spacing and sections
- » Tables of contents
- » Formatting figures and tables
- » Including graphics (you can include pdfs as images and it will recognise the text as text)
- » Equations
- » Referencing using BibTeX or Natbib
- » Cross references with the 'hyperref' package.
- » Code listings (if you want to provide code snippets in your appendix)

While LaTeX does not see much used in industry, it can be useful for the following once you have learned it:

- » There are a number of great LaTeX templates for writing resumes. LaTeX is actually quite suited to this task.
- » You can create presentations with a lot of maths in them using a LaTeX document class called beamer.

Careers

Where to apply (industries and employers)

Applying for jobs can be a stressful and time-consuming experience. It can be difficult to know where to apply with the plethora of companies out there. Sometimes actuarial science will not be listed on the degrees a company is looking for but that does not mean you shouldn't apply. Selling your skills can be a big part of being successful at job applications. In this subsection, we describe some of the industries actuarial students have found themselves working in, in the past.

Below is a list of industries actuarial students may wish to apply for.

Note that the companies mentioned below are not necessarily an exhaustive list. Those who have a prominent office in Perth, will be in **bold** (note that we may not bold a company that has offices in Perth due to the fact their actuarial intake is over east).

See the Careers Websites subsection under 'Useful Information for Students' [above](#) for more information of where to find opportunities.

A note on actuarial roles

Actuarial science students at Curtin will often not end up in "actuarial" roles. It is far more common for them to be a consultant (but not an actuarial consultant) or even a data scientist. This is mostly due to the lack of entry-level opportunities to work in traditional actuarial roles in Perth, the situation is different in Sydney and Melbourne. This is not necessarily a bad thing as these are still great roles on which to begin one's career, being in a job that is labelled "actuarial" does have its benefits.

A key benefit of being in an actuarial role is the support you get in pursuing your actuarial fellowship. If you hold an actuarial role (whether as an actuarial consultant or actuarial analyst), not only will your employer typically pay for your exams and offer you study leave but you will also have a network of colleagues who have been or are going through the same thing who can offer support. In contrast, those that pursue their fellowship while working in a non-actuarial role will likely receive no support from their employer (through leave or financial contributions to exam) and may well be isolated by the fact that none of their colleagues are doing the same thing as them. Doing it in the latter way is not impossible but it does add extra difficulty to an extremely challenging undertaking.

With all this said becoming a fully qualified actuary is not for everyone and the actuarial science degree can prepare you for a stellar career regardless. It is highly likely that you will have to move interstate in order to find work as an actuary due to the small market in Perth. There is a clear trade-off here.

Consulting

A great number of actuarial students end up in consulting of some sort. Consulting varies greatly in terms of the roles (management, data science, strategy, actuarial etc.), as well as the clients you work with. Starting your career in consulting will give you a breadth of experience that will hold you in a high standing for the remainder of your career.

Large accounting firms

Example companies

**PricewaterhouseCoopers (PwC), KPMG, Ernst & Young (EY),
Deloitte**

Roles for actuarial students

Actuarial

Risk analytics

Assurance

Data-driven disruption of traditional accounting areas such as tax

Pros Exposure to many industries and projects

Cons Low starting salary

Warnings PwC is the only one of the big 4 to have an actuarial team in Perth

The four firms above are often referred to as the “Big 4 accounting consultancy firms”. They will each sell their differences to you but fundamentally they are all very similar entities who largely fight for the same clients.

These firms are likely to have the largest recruiting presence on campus out of all mentioned here. They typically each run a number of events throughout the semester for students to gain exposure to their firm. They are also the only firms to offer a program available for first year programs. These are one to two-day programs.

These firms are likely to be the ones you hear the most from but that does not necessarily mean they are the right fit for you. A number of actuarial students will typically end up at these firms each year but you should not feel like your career is over

An important detail which is important to mention, is that graduate roles at the big four provide a rather low salary compared to other industries we mention here. There may be higher potential for growth in the future if you progress quickly, however.

Although actuarial students will typically work in data-related roles, it is possible to get roles in some sort of advisory service line or even disrupt more traditional accounting services such as tax or audit with data science.

At least at the beginning, PwC’s Perth actuarial role is likely to be the most coveted by actuarial students. Keep in mind that they will typically only hire one graduate and this person will usually be someone who interned with them in the summer prior to third year.

Large management consulting

Example companies **Bain & Company, Boston Consulting Group (BCG), McKinsey & Company**

Roles for actuarial students Consultant

Pros Challenging work
Prestige

Cons Long hours

Warnings The interviews for roles at these firms are notoriously rigorous, some applicants study for them weeks in advance.

The three companies mentioned above are known as the “big 3 management consulting firms”. They have a huge reputation internationally and have a tendency to seek high performing people to work for them.

Technical consulting (data science and actuarial)

Example companies Finity, Quantum, Taylor Fry, AlphaBeta , Milliman,

Roles for actuarial students Actuarial consultant

Data scientist
Statistician

Pros Challenging and stimulating work

Cons Long hours

Warnings

Each of these firms are quite distinct in their own right but what they have in common is that they value technical ability much more than most consulting companies do.

These companies are all very focused on hiring the crème of the crop in terms of academic performance, while also ensuring they are well-rounded individuals. Finity and Taylor Fry are both predominately actuarial consulting companies. Finity employs the most actuaries in Australia and has a culture that values hard work but also celebrates success. Taylor Fry values research and development and has a reputation

for hiring people with PhDs (although it is certainly not a requirement). Roles at both companies are highly competitive and sought after by actuarial students at eastern states universities.

Specialised management consulting

Example companies **Data Analysis Australia, Visagio**

AlphaBeta

Roles for actuarial students Management Consultant
Statistician/ Data Scientist

Pros Challenging and stimulating work

Cons Long hours

Warnings

Visagio is a smaller management consulting that has sprung up in Perth only recently and appears to have taken a liking to actuarial students as a number of Curtin actuarial students have managed to land roles there. Visagio is actually a Brazilian company which means they do things a little differently to other firms. They hire university students by offering them “internships” where they work part time while studying during the semester and then full time outside of the semester. Once they complete their degree they will typically continue working.

Small management consulting

Example companies **Global IO, Churchill, Nous Group**

Roles for actuarial students Consultant

Pros Projects vary case to case and provide unique and interesting work, always looking to expand so opportunities for partner may become available down the road, early chances of high responsibility, less bureaucracy, travel opportunities to different offices.

Cons Fewer jobs available, less training – somewhat ‘thrown into the deep end’, stability risk if the consulting firm is very small.

Warnings Opportunities are not as well advertised on the usual mediums such as GradAustralia, GradConnections or Curtin UniHub (to name a few), generally a deeper dive into other recruiting sites or LinkedIn may be required.

As a whole, many smaller companies are experiencing growing numbers of employees (up to 25% over 2 years for Nous Group), many more opportunities are becoming available in the analytics space – though it is still essential to have transferrable skills and to think with a business mind to progress businesses.

Banking and finance

Commercial banks

Example companies **BankWest, P&N Bank**

Commonwealth Bank, NAB, Westpac, ANZ

Roles for actuarial students Risk management
Data science

Pros Broad range of areas to work in

Cons “Regulatory scrutiny”

Warnings The only bank to offer roles that are relevant to the actuarial degree in Perth is at BankWest. Those with offices in Perth don't seem to perform much quantitative work here.

These are banks that provide savings account, transactions account, loans and other lines of credit to both individuals and businesses.

BankWest is the main commercial bank in Perth. It is actually owned by Commonwealth Bank but still acts as a somewhat separate entity.

P&N Bank is a mutual bank which means it is owned by its customers rather than shareholders (unlike all the other example banks above). This structure essentially means that any profits made by the bank are meant to go towards furthering customer outcomes. It is something of a debate as to whether this structure actually results in better outcomes in reality. It also resides in Perth but is considerably smaller than BankWest.

Investment banks

Example companies Macquarie Bank, Goldman Sachs, JPMorgan Chase, Morgan Stanley

Roles for actuarial students Quantitative finance
Risk management

Pros High remuneration

Cons Long hours

Warnings These companies can have exclusive HR practices where they only hire from certain programs at certain universities (e.g. UWA and not Curtin).

Investment banks serve to assist large firms with raising capital and facilitate transactions of financial securities. They are not the "banks" you as an individual can hold a saving account and take out a loan with, although some (for example Macquarie Bank) are conglomerate banks which means they combine investment banking with commercial banking (so savings accounts do exist with Macquarie).

Some people believe that some of the large investment banks such as Goldman Sachs and Deutsche Bank are to blame for the infamous 2007/2008 global financial crisis.

Trading firms and market makers

Example companies Optiver, Akuna Capital, flow traders

Roles for actuarial students Risk
[Quantitative finance](#)/ trader

Pros High remuneration and employee benefits

Cons Can work unusual hours to match the trading hours of overseas markets

Warnings These types of firms typically only reside over east

This is not typically where Curtin actuarial students end up, but they are a destination for some actuarial students in the eastern states.

A particular example is Optiver who take students with mathematical backgrounds (from actuarial, financial mathematics, PhD and even physics) and train them in the finance they need in their first few months. They stand by the philosophy that it is easier to teach a mathematician finance than it is to teach a financier mathematics. These are quite technical roles where you are well remunerated and a highly focussed set of skills.

On quantitative finance roles in investment banks and trading firms

Some aspects of investment banking and trading firms are what is known as “quantitative finance”. Those who work in this space are known as “quants”. The work they perform has some similarities with actuarial work in the sense that they involve valuations, modelling and statistical analysis but are often more rigorous.

While actuarial students learn about finance and mathematics, they may require further education to obtain the level of rigour required to get into these roles. To [become a “quant”](#), you are likely to need a Master’s degree in Financial Engineering or even a PhD.

Insurance

Insurance is the tradition area where actuaries reside. This is the industry where you can find work that is the most relevant to your actuarial degree. Keep in mind however opportunities to work in Insurance in Perth are very limited. Contrary to what some actuarial lecturers may tell you, it is only a small minority of Curtin actuarial students who end up in the insurance industry.

Life insurance

Example companies AIA , Manulife , Prudential, Zurich Insurance

Roles for actuarial students Actuarial analyst

Pros What is taught in the actuarial curriculum so far in will be applicable in these companies and roles

Cons Due to the fact that majority of life insurance companies are comparatively large and multinational, one may experience bureaucratic inefficiencies within the workplace

Warnings The head offices for life insurers are all over east and overseas.

General insurance

Example companies RAC

Roles for actuarial students Actuarial analyst

Generic business (potential for data science)

Pros Shorter hours, exposure to the inner workings of an insurance company

Cons Less variety of work

Warnings

RAC is the only general insurer in Perth and have a very small actuarial team. They are not in the practice of hiring actuarial graduate roles but do sometimes offer actuarial internships. They have recently started a more general graduate program, targeted at business/commerce and data science students this is not an actuarial role but could be an opportunity to get into the general insurance industry.

Health insurance

Example companies HBF, BUPA, HIF, AHM, Medibank (see <https://privatehealth.gov.au/dynamic/insurer>)

Roles for actuarial students Business analyst, Actuarial analyst, Data Analytics

Pros Decent Remuneration, Discounts on insurance products (yourself and family), Free outdoor fitness sessions, work-life balance (Flexi-hours)

Cons Highly regulated industry

Warnings

HBF is the only major health insurer in Perth and have recently hired a new in-house appointed actuary. HBF are currently expanding their actuarial team so new opportunities may become available. They also have a more general business analyst graduate program with the potential for rotations in data analytics roles.

Health insurance industry as a whole is facing immensely challenging affordability and sustainability issues.

Reinsurance

Example companies Munich Re, Swiss Re, SCOR

Roles for actuarial students Actuarial Analyst, Pricing analyst

Pros High remuneration

Cons Long hours

Warnings Most opportunities in this sector reside over east or even overseas as many reinsurers are global companies.

Reinsurers can be thought of as *insurers for insurance companies*. They often cover a certain layer of claims if a high volume of claims are experienced by a covered insurance company. They also provide secondary services such as their expertise for underwriting and pricing. There are only a small number of reinsurers globally and they each write policies to insurers across the world and in multiple insurance segments to fully realise the statistical advantages of risk pooling and diversification.

Public sector

Government departments

Example companies **Department of Finance, Australian Bureau of Statistics**

Treasury, Australian Government Actuary

Roles for actuarial students Generic rotation

Pros Above average super

Work-life balance

Cons Lower salary ceiling and potential for career progression than private sector

Warnings

Regulators

Example companies APRA, ASIC

Roles for actuarial students Generic rotation

Pros A rather unique perspective on financial services

Cons Lower salary ceiling and potential for career progression than private sector

Warnings Opportunities generally only available in the Eastern states.

For those that don't know, ASIC (Australian Securities and Investments Commission) and APRA (Australian Prudential Regulatory Authority) are Australia's *market conduct* and *prudential* regulators, respectively. They are both there to protect consumers (and other stakeholders such as creditors and investors) but each has a different way of approaching it. ASIC do so by monitoring market misconduct, exploitation and transparency and APRA do so by ensuring companies are managing their risks appropriately, so that they can meet their obligations.

Both APRA and ASIC have a rotation-style graduate program across various divisions of their operations (both include data analytics). Generally speaking, APRA is considered slightly more relevant to actuarial due to their focus on solvency in the financial services industry (insurance and super in particular) but both are keen to hire actuarial students for their analytical skills.

Resources

Mining

Example companies	BHP, South32, Rio Tinto
Roles for actuarial students	Data scientist
Pros	High remuneration
Cons	Mining is a rather cyclical sector
Warnings	You may well work for a mining company indirectly even if you become a consultant in Perth, due to the heavy influence of these companies on the Perth economy.

Many mining companies are beginning to embrace data science in a big way. A number of actuarial students have been hired by these companies in data science positions in the past so there is precedent and existing rapport there.

Oil and gas

Example companies	Woodside, BP
Roles for actuarial students	Data Science, Analytics, Information Technology
Pros	High remuneration, Job security for at least medium term
Cons	Large organisations – run the risk in being lost on bureaucracy, slower promotion of position due to many candidates, less travel opportunities, desk time favoured.
Warnings	Non-traditional actuarial roles, so exposure to data analysis/structures via optional units and individual projects is desired. Generally they will hire for a technician-like role and don't want to lose graduates to further study to become actuaries! So accepting a job here is likely to mean locking in for 5-10 years.

Other

Superannuation

Example companies	WA Super, AustralianSuper
Roles for actuarial students	Actuarial analyst
Pros	The opportunity to work in a changing industry
Cons	Lots of regulation
Warnings	While this may have previously been considered a traditional actuarial role, defined benefit super is seldom offered anymore in Australia and any existing funds are running off their remaining accounts. This means that most roles in super will be in the investments space working how to invest the defined contributions appropriately.

Conglomerate

Example companies **Wesfarmers** ,

Roles for actuarial students

Pros

Cons

Warnings You will need to sell your transferable skills to them as they may not hold actuarial students in as high regard as others.

Research and academia

Example companies **CSIRO, Curtin University, Innovation Central**

Other universities

Roles for actuarial students Tutor/Lecturer/Professor

Researcher

Pros The ability to investigate things deeply

Explore your own ideas

Cons Universities can be highly bureaucratic

Can be a high stress environment with long hours

Warnings Likely to require further study, probably a PhD.

To be employed full-time as a lecturer, you are likely to require a PhD in a related field. Some lecturers in actuarial science do not have a PhD but do have a fellowship from the Actuaries Institute. You can still get experience in tertiary teaching by becoming what is known as a sessional tutor, which is someone who is employed on a casual basis by the university to supplement the teaching of the full-time staff for units with a higher enrolment. It is possible to be a sessional tutor while completing a PhD, Masters program or in some cases, undergraduate study (honours in particular).

Work in research varies significantly but to progress in almost any research domain, you are likely to require further study (i.e. a PhD).

Applying for jobs

Just how important is academic performance?

Perhaps against the common belief of some, your academic performance while at university can only get you so far when applying for professional opportunities. Not only will companies seek further evidence of your technical skills beyond what you have learnt at university, through things like previous work experience, extracurricular activities and personal projects but they are also concerned with numerous other aspects of you as a candidate including your soft skills, cultural fit with the company and being a so-called "well-rounded individual". So, the top student in terms of university grades won't necessarily get their first choice of job and a mediocre student will not be stuck with an irrelevant job or no job at all. Companies know there is more to people than their grades. They are important but it is also important to do other things.

Naturally, different companies and roles will have different expectations of academic performance so here we will give an indication of how various segments of the market approach this when hiring. Getting good grades is never a bad thing but some companies will care more about your academics than others.

Many companies will have a cut-off mark for whether they will consider a candidate or not. This is often in terms of the categorical grading scale employed by most universities (e.g. a "credit average") but could also

be a course weighted average or weighted average mark¹⁹ (e.g. an average of at least 70%). Some companies will be quite transparent about their cut-offs by stating it in job adverts but keep in mind that many companies will still have one, even if they don't say it explicitly. These cut-offs will vary by company, some companies will have very high standards because that is their idea of hiring "the best". Other companies will have lower cut-offs so they can see what more candidates have to offer.

Beyond these cut-offs, attitudes towards academics will vary widely between companies. Some companies and roles will often give some weighting to how much your marks exceed their cut-off (these will typically be more technically-oriented roles). Other companies simply ignore your academics beyond meeting their chosen cut-off and then focus solely on other aspects of you as a candidate. These firms will typically be larger companies such as the big 4 accounting firms who receive thousands of candidates in each offering.

Some roles will also care about which degree you have done. An advantage of actuarial science is that it will tick the box for many different roles with restrictive expectations on what you study. Even if they don't state actuarial science specifically, you will still typically satisfy the requirements as an actuarial student if they are looking for a mathematics, statistics, data science or (sometimes) finance student for a role.

Actuarial roles are also important to note here as many of them will have far more specific academic criteria than more generic roles. Many actuarial roles will expect you to be in an accredited actuarial program (Curtin's is one of these). They will often expect you to have obtained most or all of your exemptions and to have a high average. They will also value honours more than most roles due to the additional actuarial accreditation it provides. This is not always true however as some companies will apply their same academic cut-offs for generic roles (with little investigation after this) even for highly niche actuarial roles (for example the big four).

Some companies will also expect students to be from a university with a high reputation. Investment banks in particular are known to do this. Curtin's reputation will vary by company, with those situated in Perth far more likely to view Curtin in high regard than companies that reside interstate.

On applying for opportunities interstate

While many Curtin actuarial students end up working in Perth, some will inevitably wind up in the eastern states where more opportunities for actuarial work exist. Sydney and Melbourne are where many a head office is located in Australia and therefore where the majority of traditional work in financial services is delivered.

If you decide to apply for roles interstate be mindful of the logistics of potential interviews and assessment centres. Some companies will accommodate the fact the you are in Perth by offering you a interview via video call (e.g. Skype) instead. However, other companies will expect you to fly out to attend their assessment centre or interview in their office like all the other candidates. This is both time and money intensive as most companies will not pay for your flights and accommodation and it will likely be in the middle of the university semester.

There are distinct benefits to working in the eastern states over Perth however as there are far more companies there (particularly in Sydney and Melbourne). Many former Curtin actuarial students working over east end up in actuarial roles. In fact of the Curtin students in actuarial roles, it is highly likely that the majority of them are in Sydney or Melbourne. The actuarial community in Sydney and Melbourne is far larger, meaning you can build a far greater network there. Additionally, if you want to avoid the [resources](#) industry, getting out of Perth might be your best option.

Skills and personal development

The actuarial profession is one where career-long learning is built into the very fabric of membership. It is important that you continue to grow your skill base beyond formal study to remain up to date.

¹⁹ Curtin University is fairly unique in calling it a course weighted average (CWA). Most other universities (in particular those in the eastern states) that use a similar system (i.e. a percentage grade rather than a GPA) will call it a weighted average mark (WAM). Keep in mind that they are exactly the same thing so if you are ever asked for your "WAM", just give them your CWA.

Technical skills

Programming languages

Programming is increasingly becoming a major part of the work that actuarial graduates perform. Gone are the days of actuaries and actuarial students doing everything in Excel. Some employers may have the highly dated impression that “all actuarial students know is Excel and a bit of VBA”. It is therefore important to market your ability to code when applying for technical roles, particularly those in data science. We shouldn't claim to be on par with computer scientists, but our skills still cannot be ignored.

Below we summarise some programming languages that are commonly used in industry. Many of them can be learned at an introductory level at Curtin but mastering them is likely to require considerable additional work.

Note that, where a list of units is provided below, it will not necessarily be an exhaustive list. Those who are on the actuarial science handbooks (either as core units or optional units) will be in **bold**. Any unit that is not bold may be taken as either an elective unit (only for actuarial and applied statistics major) or negotiated as an alternative to an optional unit with the course coordinator.

R

Uses	Statistics Data science
Pricing	Free
Open Source?	Yes
Prominent Industries	Research Companies that do data science
Units at Curtin that use it	STAT1005 Introduction to Probability and Data Analysis (replacing STAT1001 and STAT1002 in 2020) STAT1006 Regression and Nonparametric Inference (replacing STAT1000) STAT2003 Analytics for Experimental and Simulated Data STAT2004 Analytics for Observational Data STAT3001 Statistical Modelling MATH3005 Survival Analysis (will be replaced by MATH3008 Survival Models & Analysis in 2022) ACTL4003 Predictive Analytics Principles STAT1003 Introduction to Data Science STAT2005 Computer Simulation STAT3009 Risk Analysis (coming in 2022)

All the units at Curtin that use R, do so incidentally while learning other things (usually topics in statistics). They don't tend to teach it as a programming language in its own right and this can lead some students to see it as a glorified graphical calculator. In reality, it is far more powerful than that.

To learn R as its own thing, rather than a learning tool, you need to need to do some extra work outside of the prescribed university curriculum. You may be fortunate enough to learn it as part of some sort of internship for example but more generally you will need to engage in self-learning.

Learning about the philosophy behind R as a language can be helpful as it is quite different to other languages such as Python. R has something of a reputation for being slow (which it certainly is, when compared to high-performing languages such as C) but you can make your code run much faster if you understand its philosophy. The first thing to understand with R is that most operations are based on vectors, so “vectorizing” your operations is usually optimal. Using for-loops in R is considered bad practice in most situations, it is typically better to perform iterative operations in a “functional” way by using either

the `*apply` family of functions in base R or the `map*` family of functions in the `purrr` package (a member of the tidyverse mentioned below).

A part of R that is very worthwhile investing some time into is a collection of packages known as the ‘tidyverse’ for working with data (from tidying to transformation to visualisation). They were developed by Hadley Wickham (and others), who is a famous name in R development you ought to remember. Not only are the individual packages in the tidyverse extremely useful but they also complement each other seamlessly and come with a general philosophy and framework for working with data which is very powerful. The best way to learn about the tidyverse is from the creator himself, Hadley Wickham who is a fantastic communicator. Some of the ways you can learn from him include:

- » Reading and following along with his excellent book [R for Data Science](#).
- » Reading the [package documentation](#) for each of the packages that make up the tidyverse.
- » Watching some of the many videos available of him presenting on YouTube (just search for “Hadley Wickham”). An example of this is the following two-part tutorial on the package `dplyr` (a member of the tidyverse):
 - ↳ <https://www.youtube.com/watch?v=8SGif63VW6E>
 - ↳ <https://www.youtube.com/watch?v=Ue08LVuk790>

You may gain a small amount of incidental exposure to the tidyverse in units at Curtin, but you are unlikely to learn its attached philosophy or get a full grasp of all the packages. Learning it properly with its attached philosophy does require personal effort but it will certainly pay off. Using the tidyverse your honours or industrial project (if you are doing honours or the applied statistics third year stream) could be a good way to start learning. You will certainly see reward for the effort you put into learning this.

One thing to keep in mind if you choose to learn about the tidyverse is to also know about base R and other R packages as well. As much as the tidyverse might suggest it is an enclosed “universe” of functions that should be used only their own, there are many extremely helpful aspects of base R, as well as other packages outside of the tidyverse that you should be aware of and utilise.

Python

Uses	Data science Web development General purpose
Pricing	Free
Open Source?	Yes
Prominent Industries	Mining Companies that do data science
Units at Curtin that use it	COMP1005 Fundamentals of Programming COMP1003 Data Structures and Algorithms STAT2005 Computer Simulation COMP3009 Data Mining

There is something of a two-horse race in data science between R and Python (although there are other languages that are used as well). Both are excellent tools for data science, and each have their own advantages. Typically, those of a computer science inclination will prefer Python and those with more of a statistical inclination will prefer R.

Python can be picked up and subsequently extended upon in a number of units at Curtin. These units are typically part of the [Data Science degree](#) but can be picked up as electives by actuarial students. [COMP1005](#) Fundamentals of Programming should be completed first. It is a prerequisite for all the other units that use Python and provides foundational knowledge.

An advantage of Python is that it can be used for a great many applications which means if you want to learn it with a personal project, you have many options.

SQL (Structured Query Language)

Uses	Databases
Pricing	Many different “flavours”, some of which are free
Open Source?	No
Prominent Industries	Most companies will use some flavour of SQL for their databases
Units at Curtin that use it	ISYS1001 Database Systems

In spite of the fact that very few learn it at university, many actuarial students end up using SQL in their careers. Some are fortunate enough to get exposure to it during internships. It is one of these skills that every data scientist will inevitably have to pick up.

If you can manage to fit it into your study plan as an optional (negotiated) or elective unit, [ISYS1001](#) Database Systems is a unit worth taking (keep in mind that [COMP1005](#) Fundamentals of Programming is a prerequisite however).

SAS (Statistical Analysis System)

Uses	Databases, statistics
Pricing	Paid (educational licences are available if you want to try it)
Open Source?	No
Prominent Industries	banking general insurance
Units at Curtin that use it	N/A (STAT3003 Applied Statistics used to use it but then it was replaced by R and now the unit is no longer offered)

This is an older proprietary software that is used by many firms in the financial sector. If you work in banking, general insurance or consulting companies that consult to these industries, you will likely be required to learn it in the job.

Note that many firms are attempting to move away from SAS and replace it with R and Python but this process will not happen overnight. SAS comes with customer support and a consistency (e.g. R and Python packages could be written by anyone and therefore have some level of inconsistency associated with them) that is not necessarily offered by free software such as R and Python. There also may be a resistance to change due to the cost of changing systems over and training staff in different software.

VBA (Visual Basic for Applications)

Uses	Macros and userforms within the Microsoft office suite (Excel in particular)
Pricing	Comes with Microsoft Office
Open Source?	No
Prominent Industries	Insurance Consulting
Units at Curtin that use it	MATH2005 Mathematical Financial Modelling (this unit may be removed in future) ACTL1003 Introductory Actuarial Practices (this is a new unit and it is not entirely clear what will be covered in it, but it is assumed that VBA will be covered to some extent) ACTL1000 Principles of Actuarial Science (no longer offered)

VBA is used by a number of firms to automate certain processes and to create userforms. Do not underestimate the power of knowing VBA, even if it isn't as sophisticated as other languages.

Curtin students will learn it in the units mentioned above but it may (depending on the year) also come up in assignments for the following units:

- » [MATH2004](#) Theory of Interest
- » [MATH3007](#) Life Contingencies 2
- » [ACTL4000](#) Actuarial Control Cycle 1
- » [ACTL4001](#) Actuarial Control Cycle 2

While you will not be actively taught how to use VBA in these units, learning by doing a project is often a great way to pick up useful skills.

Julia

Uses Data science
Numerical calculations
General purpose

Pricing [Free](#)

Open Source? Yes

Prominent Industries Companies that do data science (small)

Units at Curtin that use it Nil

Julia is a language that was designed for numerical calculation but also useful for much more which makes it excellent for data science. Julia is a more uncommon language that is beginning to gain prominence in the world of data science. Unfortunately, it is not taught at Curtin but this also makes it an interesting point of difference on your resume if you go to the trouble of learning it compared to R and Python which are highly prevalent skills among students.

Julia in many ways makes up for the deficiencies of R and Python by being much faster (with speed on par with or approaching that of C), while also retaining the readability of the aforementioned languages. It also has the ability to include packages from R, Python, C, FORTRAN and more. Julia is however not in common use, so some companies may not see it as a useful skill. As it is on the rise however, you may see mentioned as desirable in job adverts for niche data science roles.

Other languages

The languages mentioned above are far from an exhaustive list given hundreds exist. They are however the main ones that appear in actuarial, data science and other relevant roles. This being said, it can't hurt to learn something different.

Some actuarial students will learn the (rather archaic) FORTRAN language if they take [MATH2015](#) Mathematical Computing as an optional unit. It is a language for numerical computation that dates back to the 1950s. It was used by NASA to assist with the moon landing. Now we are in the 21st century, you are unlikely to cross paths with FORTRAN in industry but it does still see some practical use in supercomputing.

C and Java (among others) are widely popular languages in software development and could be useful to learn for some students who are really interested in computer science. They are generally much faster than the languages mentioned above but don't have the specifically-designed tools that make R and Python for example so powerful.

HTML, CSS and JavaScript (amongst) are used for web development. HTML is a mark-up language that dictates structure of webpages, CSS adds some additional cosmetics on top of that (e.g. colour) and JavaScript is a scripting language that (amongst other things) can be used to make webpages more dynamic. Of course, actuarial graduates aren't typically involved in web development in the job they wind up in.

It can be useful to pick some HTML up in particular as you can combine some very basic HTML knowledge with an R or Python package (Rvest and BeautifulSoup respectively) to do something called "web scraping": exploiting the structure of a website in order to extract data from it. This can be a useful way of obtaining data that you could use as a data scientist.

Software

Microsoft Excel

Uses	Spreadsheets Forms
Pricing	Part of the MS Office Suite
Open Source?	No
Prominent Industries	You will struggle to find a firm that doesn't use Excel for something
Units at Curtin that use it	MATH2005 Practical Mathematical Financial Modelling (this unit may be removed in future as it does not appear on the 2020 handbook)

[ACTL1003](#) **Introductory Actuarial Practices**

[ACTL1000](#) Principles of Actuarial Science (no longer offered)

Excel is one of those skills that most workplaces will require applicants to have. And actuaries have a reputation for being "Excel wizards".

At Curtin, actuarial science students the opportunity to learn Excel in several units. To truly master Excel however, you need to do additional work. Using it for personal projects, attending skills-based workshops, work experience and even certain extracurriculars (for example the student actuarial society committee does some spreadsheets) are all ways in which you can further hone your excel skills.

Excel is a vast (some would even say bloated) program, you will have to use it a lot before you stop learning new things. There is a potential for arrogance as an actuarial student to think they know everything there is to know but this is unlikely to be the case.

Tableau

Uses	Dashboarding
Pricing	Paid (free trial education licences available)
Open Source?	No
Prominent Industries	Consulting
Units at Curtin that use it	ACCT5034 Analysis and Visualisation of Financial Data (as this is a postgraduate level unit, most actuarial students will be ineligible to take it)

Dashboarding is a favoured approach for many consulting companies to present findings of data analysis. Tableau is fairly intuitive and can be learned on the job, some will experience it in their internships.

Tableau has a drag-and-drop interface which makes it very helpful for non-technical people (hence why consultants like to use it for communicating with clients). There is a very limited "language" embedded within it for creating calculated fields.

Microsoft Access

Uses	Databases
Pricing	Part of the MS Office Suite
Open Source?	No
Prominent Industries	Some firms use it for databases, but it is less prominent than it once was.
Units at Curtin that use it	MATH2005 Mathematical Financial Modelling (this unit may be removed in future as it does not appear on the 2020 handbook; the MS Access topic has also been removed as of 2019)

MS Access comes up for some students in their careers.

Soft skills

Presentation skills

Public speaking is a vital part of many careers. For many people, it is a daunting task to get up in front of people and talk. The key to overcoming this is often exposure, if you frequently practice it, the nerves you feel can often be replaced by a feeling of excitement instead.

Creating a presentation slides that add value by being both uncluttered but also informative is another important part of document preparation. It is often the case that simpler is better, unless you are careful, creative flourishes may serve only to distract the viewer of your presentation.

Appendix

A Brief History of the SAS Guide

This document has been a long time in the making. Our 2018 IT officers were inspired to create it based on viewing the websites of various actuarial societies across Australia for the purpose of improving the website of their own (or rather Curtin's) actuarial society. Whilst doing so they continued to stumble upon documents similar to this one, which described units taken by actuarial students at their universities. The inaugural edition of the guide was published prior to the commencement of semester 1 2019. It was downloaded over 100 times throughout the semester. We at the Student Actuarial Society hope to see this success continue into the future.

In the summer of 2019/20, a team of SAS committee members undertook a serious overhaul of the entire document. Significant improvements to the formatting of the document were made and a new careers section was added.

We would like to acknowledge the efforts of everyone who has made a contribution to this document. The relevance and utility of our unit guides in particular, rely heavily upon your input.

Future additions to the guide

This guide as a work in progress, you may have noticed that many of the unit guides are incomplete for example (as we are yet to receive a review for them). If you have any suggestions for improvements, please let us know.

In addition to updating and improving on the current contents of this document, it is our intention to add more sections to it as well.

Planned future changes to this document include:

- » Updating information on actuarial accreditation under the new system as it becomes clearer.
- » Addition of information for July intake/part time students' study load/structure.
- » Continual updates on the new careers section.
- » Updating information on new units that have previously not been taken and removing units from the guide as they become irrelevant.

Units for which we require further student input

Please fill out one of the forms in the link at the bottom of each page. If you have recently taken any of the units listed below.

Units for which our information is over a year out of date:

- » [ECON1000](#) Introductory Economics (Sem 2 2018)
- » [ECON2001](#) Macroeconomic Principles (Sem 2 2018)
- » [STAT3000](#) Statistical Inference (Sem 1 2018)
- » [COMP1002](#) Data Structures and Algorithms (Sem 2 2018)
- » [STAT1003](#) Introduction to Data Science (Sem 1 2018)
- » [INDE2000](#) Supply Chain Modelling and Optimisation (Sem 1 2018)
- » [MATH2000](#) Network Optimisation (Sem 2 2018)
- » [MATH2010](#) Linear Algebra 2 (Sem 2 2017)
- » [MATH2011](#) Operations Research (Sem 1 2018)
- » [MATH2015](#) Mathematical Computing (Sem 1 2017)
- » [STAT2003](#) Analytics for Experimental and Simulated Data (Sem 2 2017)

Units which are yet to receive student input:

- » [STAT2004](#) Analytics for Observational Data
- » [INDE2001](#) Logistics Modelling and Optimisation
- » [STAT2005](#) Computer Simulation
- » [COMP3009](#) Data Mining
- » [INDE3000](#) Industrial Modelling and Optimisation
- » [INVE3000](#) Introduction to Derivative Securities
- » [INVE3001](#) Portfolio Management
- » [MATH3001](#) Applied Mathematical Modelling
- » [MATH3004](#) Industrial Project

Units that are yet to be offered but we would like input when they have been:

- » [ACCT1002](#) Financial Decision Making
- » [ACTL1002](#) Introduction to Actuarial Science
- » [NPSC1003](#) Integrating Indigenous Science and STEM
- » [STAT1005](#) Introduction to Probability and Data Analysis
- » [ACTL1003](#) Introductory Actuarial Practices
- » [STAT1006](#) Regression and Nonparametric Inference
- » [MATH3008](#) Survival Models & Analysis
- » [MATH3009](#) Contingencies 1
- » [STAT3010](#) Financial Engineering 2
- » [MATH3010](#) Contingencies 2
- » [STAT3008](#) Provisioning Techniques
- » [STAT3009](#) Risk Analysis
- » [ACTL4003](#) Predictive Analytics Principles
- » [ACTL4004](#) Actuarial Risk Management