STAT3038/6045
Actuarial Techniques

Course Description
This course provides a simplified model for solving actuarial problems in practice. Sample actuarial problems are examined in detail, with solutions being developed using Excel and Visual Basic. These solutions are then reported to the stakeholders of the problem. The aim of this course is to develop actuarial capabilities beyond the technical foundations taught in other actuarial courses.

Semester and Year | Semester 2, 2014
Mode of Delivery | On campus
Prerequisites | For STAT3038, completion of STAT2032 and completion of or concurrent enrolment in STAT3004, STAT3036 and STAT3037.
For STAT6045, completion of or concurrent enrolment in STAT6043.
Incompatible Courses | N/A
Course Convener | Adam Butt
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Phone: | 6125 3580 or x53580
Email: | adam.butt@anu.edu.au
Consultation hours: | I have an open door policy and am happy to take questions whenever I am in my office. Alternatively you may wish to make an appointment by using the above contact details.
Bio and research interests | I have been teaching in the actuarial program at ANU since 2005 and am the program convener for the Bachelor of Actuarial Studies and the Bachelor of Social Sciences (Honours in Actuarial Studies and Economics). Prior to that I worked as a consultant on superannuation-related matters. I am a Fellow of the Institute of Actuaries of Australia.
My research interests include individual decisions in relation to retirement and actuarial education.
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Student Administrator | Anna Pickering
Room 4.48, CBE Building 26C
COURSE OVERVIEW

Course Learning Outcomes
Upon successful completion of the requirements for this course, students will be able to:

1. Identify actuarial problems in a variety of contexts.
2. Identify the key factors that need to be taken into account in solving actuarial problems.
3. Use computer-based tools to assist in solving actuarial problems.
4. Communicate in writing the results of the solution to the actuarial problem to a variety of stakeholders.

Research-Led Teaching
The majority of the content in this course is taught using a “problem-based learning” (PBL) approach. Under a PBL approach, the majority of learning is experienced in the consideration of detailed problems that students are required to solve, with students being required to do their own research in solving the problems. Hence the structure of classes may be different from what you have experienced in other courses. The expected benefits to students of PBL are increased engagement and autonomy of learning experience. The course is deliberately structured in this way to prepare students for work and/or future study that will require problem solving skills not fully developed in other courses in the actuarial program.

Continuous Improvement
This is the second time that this course has been run in its current structure. Much feedback was obtained from students and group consultants when this course was first run in 2013, and as such a number of changes have been made to the course for 2014. The most significant of these changes from the previous version of the course include:

- Whilst groups will still be allocated randomly, separate groups will be formed for the two assignments
- Greater clarity will be provided about the role and responsibilities of group consultants
- Greater guidance will be provided to groups about expectations of effort for all group members
- Assignment 1 is smaller in scope and will be due before the mid-semester break

Technology, Software, Equipment
The use of Excel and Word is required for the completion of all assessment in this course. You are not required to have any background in Excel or Word before taking this course; some Excel training will be provided in Week 2 of the course and the use of Word will be relatively simple. Excel and Word may be used on campus or on the students’ personal computers or laptops. Students are encouraged to bring a laptop to the workshops to allow Excel interaction; groups will be structured in such a way that each group has access to at least one laptop in class.

Requisites
STAT3038 has been deliberately designed to be taken as late as possible in the undergraduate actuarial program, as it will draw material from a variety of other actuarial courses together and apply that material to broad actuarial problems. Whilst the pre-requisite structure should ensure that students take the course late in their undergraduate
program, it is recommended here that students choose to take STAT3038 as late in their program as possible.

Co-teaching
Students in STAT3038 and STAT6045 will be taught together in this course. There will be a single Wattle site that students in both STAT3038 and STAT6045 will be enrolled in.

Student Feedback
All CBE courses are evaluated using Student Experience of Learning and Teaching (SELT) surveys, administered by Planning and Statistical Services at the ANU. These surveys are offered online, and students will be notified via email to their ANU address when surveys are available in each course. Feedback is used for course development so please take the time to respond thoughtfully. Course feedback is anonymous and provides the Colleges, University Education Committee and Academic Board with opportunities to recognise excellent teaching and to improve courses across the university. For more information on student surveys at ANU and reports on feedback provided on ANU courses, visit http://unistats.anu.edu.au/surveys/self/students/ and http://unistats.anu.edu.au/surveys/self/results/learning/

COURSE SCHEDULE

<table>
<thead>
<tr>
<th>Week</th>
<th>Learning Outcome</th>
<th>Summary of Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1-2</td>
<td>Introduction to Group Work &amp; Elements of Actuarial Problem Solving</td>
</tr>
<tr>
<td>2</td>
<td>2-3</td>
<td>Cash Flow Modelling (Deterministic)</td>
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<tr>
<td>3-6</td>
<td>1-4</td>
<td>Workshops relating to Assignment 1</td>
</tr>
<tr>
<td>7</td>
<td>1-4</td>
<td>Introduction to New Groups &amp; Exam Preparation</td>
</tr>
<tr>
<td>8</td>
<td>2-3</td>
<td>Cash Flow Modelling (Stochastic)</td>
</tr>
<tr>
<td>9-12</td>
<td>1-4</td>
<td>Workshops relating to Assignment 2</td>
</tr>
<tr>
<td>13</td>
<td>1-4</td>
<td>Exam Preparation</td>
</tr>
</tbody>
</table>

Classes
Classes for the course will consist of two workshops each week (see http://timetable.anu.edu.au for details of class times), each being of two hour duration. There are no tutorials for the course. Workshops will be structured around a series of problems designed to introduce students to the techniques required in solving actuarial problems. Students will spend the majority of time in class working in groups. Workshops are numbered X.Y, with X representing the week and Y being 1 or 2 to represent the number of the workshop for that week. The written material each week will be split into two components; documents with “Information” in the title will provide background information that students will be expected to have read before class. Other workshop documents will contain the activities to be undertaken in workshops.

Group Work and Group Allocation
Many of the problems considered in this course (including Assignment 1 and Assignment 2) will be done by groups. This is done for two reasons. One reason is to provide a simplified replica of a team environment in order to provide students with some preparation for a likely upcoming transition to work. For this reason groups will be allocated randomly in Workshop 1.1, with group composition placed on Wattle immediately after this workshop. After the completion of Assignment 1, new groups will be allocated in Workshop 7.1, with group composition placed on Wattle immediately after this workshop.
The second reason for using group work is to enable the consideration of problems too large for individuals to have time for. The two assignments that are the centrepieces of this course are designed to be unstructured and realistic, although simple enough for groups to have the ability to attempt.

Groups will be provided with significant training on techniques for effective group work. An additional 90 minute workshop in Week 2 has been prepared to provide the majority of this training. A variety of times for this workshop are available; groups will be required to sign up to this workshop on Wattle. Further information will be provided in Workshop 1.1.

Groups should expect to meet in person on at least a weekly basis. Breakout Room 1 on the mezzanine level of CBE Building 26C has been set aside for STAT3038/6045 groups to meet in over the semester. Groups can sign up to a weekly one-hour meeting time in this room on Wattle. Alternatively groups can meet in another location of their choosing. Further information will be provided in Workshop 1.1.

A discussion forum marked “Group Forum” has been provided on Wattle specifically for group interactions and will only be available to group members, group consultants and the course convenor. In addition to allowing the effective distribution of information within groups, groups are also encouraged to use the group forums as a record of their group interactions should any disputes occur amongst the group. Groups may choose to use other methods of sharing information as they see appropriate. Further discussion of group dynamics will occur in the first week of the course and in the Week 2 training session described above.

Consultation
Each group will be allocated a group consultant, whose role it is to provide guidance to groups during the course. Details on the group consultant allocated to each group will be placed on Wattle shortly after the groups have been allocated. Further details on the role of the group consultant have been placed on Wattle.

COURSE ASSESSMENT

Assessment Summary

<table>
<thead>
<tr>
<th>Item</th>
<th>Title</th>
<th>Value</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Assignment 1</td>
<td>30%</td>
<td>Tuesday 2 September at 5pm</td>
</tr>
<tr>
<td>2</td>
<td>Assignment 2</td>
<td>30%</td>
<td>Friday 24 October at 5pm</td>
</tr>
<tr>
<td>3</td>
<td>Examination</td>
<td>40%</td>
<td>To be advised</td>
</tr>
</tbody>
</table>

All assessment will cover all learning outcomes of the course.

Assignment 1
This task will be completed in groups and will require groups to perform a deterministic cash flow projection for a stakeholder and report the results of that projection to the stakeholder. It is due on Tuesday 2 September at 5pm. Further information about the assignment will be provided in the assignment description on Wattle.

Assignment 2
This task will be completed in groups and will require groups to perform a stochastic cash flow projection for a stakeholder and report the results of that projection to the stakeholder. It is due on Friday 24 October at 5pm. Further information about the assignment will be provided in the assignment description on Wattle.
**Assignment Submission**
Assignments are submitted using the course Wattle site. The ANU is using Turnitin to enhance student citation and referencing techniques, and to assess assignment submissions as a component of the University’s approach to managing Academic Integrity. For additional information regarding Turnitin please visit ANU Online. Further information about assignment submission will be provided in the assignment description on Wattle.

**Extensions and Penalties**
Late assignments will be penalised at a rate of 20% per day of the maximum marks available for the assignment. Extensions may be granted on medical or compassionate grounds on production of appropriate evidence and must have the course convenor’s permission. Requests for extensions should be submitted by email to the course convenor well before the assignment is due, although they may be discussed informally with the course convenor before making a request by email.

**Assignment Grading**
Members of a group will generally all receive the same mark, although the course convenor reserves the right to award individual students a lower mark than others in the group where meetings with the group consultant and a post-assignment survey reveal significant deficiencies in the effort put in by any members in a group. Further information on this process is found in the assignment descriptions on Wattle.

**Returning Assignments**
Group consultants will advise groups how their assignments are to be returned.

**Examination**
The examination will be completed on an individual basis and take place during the regular exam period (see [http://timetable.anu.edu.au/exams/](http://timetable.anu.edu.au/exams/)). It will be 3 hours in length, plus 15 minutes of reading time. The exam will be open-book and is expected to be held in the computer laboratories on campus. Further information will be provided to students in class and on Wattle.

**Scaling**
Your final mark for the course will be based on the raw marks allocated for each assignment or examination. However, your final mark may not be the same number as produced by that formula, as marks may be scaled. Any scaling applied will preserve the rank order of raw marks (i.e. if your raw mark exceeds that of another student, then your scaled mark will exceed or equal the scaled mark of that student), and may be either up or down.

**READING LISTS**
All basic course materials will be available on Wattle. Students will be required to print these out themselves if they want a hard copy of them.
COMMUNICATION

Announcements
The primary method of communicating with students will be through Wattle (https://wattle.anu.edu.au), the University's online learning environment. Log on to Wattle using your student number and your ISIS password. Students are expected to check the Wattle site for announcements about this course, e.g. changes to timetables or notifications of cancellations. Notifications of emergency cancellations of lectures or tutorials will be posted on the door of the relevant room.

Email
If necessary, the course convenor and group consultant for this course will contact students on their official ANU student email address. Information about your enrolment and fees from the Registrar and Student Services' office will also be sent to this email address.

From students
Any non-personal queries regarding the course should generally be made through the appropriate discussion forum in Wattle. Any personal queries regarding the course should generally be made by emailing the course convenor. Queries will typically be answered within 24 hours on weekdays.

General information for actuarial students
A generic Wattle site has been created for actuarial students called “Actuarial Students’ News and Information”. The purpose of this page is to provide actuarial students with up to date news on the actuarial profession, requirements for qualification, job opportunities and any other relevant information. To access it, login to Wattle and in the “Search Courses” box at the top of the page search for “Actuarial”. Then find the link to the “Actuarial Students’ News and Information” page and click on it, selecting “Yes” to enrol in the course. You will remain enrolled in the site for the remainder of your degree at ANU.

POLICIES
The University offers a number of support services for students. Information on these is available online from http://students.anu.edu.au/studentlife/.

ANU has educational policies, procedures and guidelines, which are designed to ensure that staff and students are aware of the University’s academic standards, and implement them. You can find the University’s education policies and an explanatory glossary at: http://policies.anu.edu.au/.

Students are expected to have read the Student Academic Integrity Policy before the commencement of their course.