STAT3037
Life Contingencies

Course Description
This course develops actuarial techniques for the valuing of policies which depend on contingent events concerning uncertain lifetimes. Topics include principal forms of heterogeneity within a population and the ways in which selection can occur; definition of simple assurance and annuity contracts; development of formulae for means and variances of the present values of payments; evaluating expected values and variances of simple insurance and annuity contracts; description and calculation of net and gross premiums and provisions for various insurance contracts; and cash flow models and profit tests, extended to multiple decrements and multiple state models.

Mode of Delivery
On campus

Prerequisites
STAT2001 Introductory Mathematical Statistics and STAT2032 Financial Mathematics

Co-taught Courses
STAT6046 – Financial Mathematics

Course Convener
Abhinav B Mehta
Office Location: Room 3.54, ANUCBE Bldg. 26C
Phone: 02 6125 1081
Email: Abhinav.Mehta@anu.edu.au
Consultation hours: Please check wattle site for the latest information

Bio and research interests
Abhinav is an Associate Lecturer in RSFAS, Fellow of the Higher Education Academy and an Associate of the Institute of Actuaries of Australia. His research interests are in the field of Crime Statistics, Medical Statistics and Biostatistics. He is also pursuing his PhD in Statistics from RSFAS.

Tutor(s)
TBA

Student Administrators
Colleen Lee
Level 4 ANUCBE Bldg 26C
Colleen.Lee@anu.edu.au

SEMESTER 2
2017

http://programsandcourses.anu.edu.au/course/STAT3037
COURSE OVERVIEW

Course Learning Outcomes
Upon successful completion of the requirements for this course, students will achieve an understanding of and facility in:

- Mortality and selection.
- Life assurance contracts and life annuity contracts.
- Evaluation of assurances and annuities.
- Reserves and policy values.
- Mortality profit and extra risk.
- Increasing insurances and with-profit policies.
- Increasing annuities and applications of reserves.
- Multiple life functions and policies involving two or more lives.
- Contingent and reversionary benefits

Research-Led Teaching
The material covered in this course covers established principles in actuarial work and academia.

Technology, Software, Equipment
All course notes and materials will be provided via Wattle. You will need access to a computer to get the materials necessary for the course. We will use MS Excel in this course. Some in class work will be illustrated using MS Excel. Learning guides and short video lectures will be made available on wattle for students to learn the application of the concepts taught in this course. Students will have to complete their assignment using MS Excel or a spreadsheet program.

Co-teaching
This course will be taught alongside STAT6043. There will be some material in this course which may not be relevant to STAT3037. This will be clearly identified during the lecture and/or tutorial.

Staff Feedback
Students will be given feedback in the following forms in this course:

- Responses to the online quizzes
- Responses to the assignment
- Through one on one conversations during consultations

Student Feedback
ANU is committed to the demonstration of educational excellence and regularly seeks feedback from students. One of the key formal ways students have to provide feedback is through Student Experience of Learning Support (SELS) surveys. The feedback given in these surveys is anonymous and provides the Colleges, University Education Committee and Academic Board with opportunities to recognise excellent teaching, and opportunities for improvement.
For more information on student surveys at ANU and reports on the feedback provided on ANU courses, go to

http://unistats.anu.edu.au/surveys/selt/students/ and
http://unistats.anu.edu.au/surveys/selt/results/learning/

COURSE SCHEDULE

<table>
<thead>
<tr>
<th>Week</th>
<th>Summary of Activities</th>
<th>Assessment</th>
</tr>
</thead>
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<tr>
<td>1</td>
<td>Mortality and selection</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Life assurance and annuity contracts</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Evaluation of assurances and annuities.</td>
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<tr>
<td>4</td>
<td>Gross premium calculations and accumulations</td>
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<tr>
<td>5</td>
<td>Reserves and policy values</td>
<td>Online Quiz</td>
</tr>
<tr>
<td>6</td>
<td>Policy values, mortality profit and extra risk</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Increasing insurances and with-profit policies</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Increasing annuities and applications of reserves</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Multiple life functions and policies</td>
<td>Assignment</td>
</tr>
<tr>
<td>10</td>
<td>Cash flow models and profit testing</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Unit-linked policies</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Multiple decrement and multiple state models</td>
<td></td>
</tr>
</tbody>
</table>

COURSE ASSESSMENT

<table>
<thead>
<tr>
<th>Item</th>
<th>Title</th>
<th>Value</th>
<th>Due Date</th>
<th>Linked Learning Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Online Quiz</td>
<td>10%</td>
<td>Week 5</td>
<td>This covers all material up to and including what is covered in the lecture notes of weeks 1-4</td>
</tr>
<tr>
<td>2</td>
<td>Assignment</td>
<td>20%</td>
<td>Week 9</td>
<td>This covers all material up to and including what is covered in the lecture notes of weeks 1-7</td>
</tr>
<tr>
<td>3</td>
<td>Final exam</td>
<td>70%</td>
<td></td>
<td>This covers all material in the course.</td>
</tr>
</tbody>
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ASSESSMENT REQUIREMENTS

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 the ANU Online website.

This course does not require the students to use Turnitin for assignment submission.

As a further academic integrity control, students may be selected for a 15-minute individual oral examination of their written assessment submissions.

Any student identified, either during the current semester or in retrospect, as having used ghost writing services will be investigated under the University’s Academic Misconduct Rule.
Assessment Task 1: Online Quiz
Details of task:
This covers all material up to and including what is covered in the lectures of weeks 1-4. Specific details regarding examination conditions will be provided once confirmed. The online quiz will be carried out on Wattle and can be attempted at the prescribed time during week 5. More details regarding access and completion of the quiz will be provided in the lectures and on wattle. The quiz is compulsory for all students and is worth 10% of your overall mark.

Extensions and Penalties
Extensions and late submission of assessment pieces are covered by the Student Assessment (Coursework) Policy and Procedure.

The Course Convener may grant extensions for assessment pieces that are not examinations or take-home examinations. If you need an extension, you must request it in writing on or before the due date. If you have documented and appropriate medical evidence that demonstrates you were not able to request an extension on or before the due date, you may be able to request it after the due date.

No submission of assessment tasks without an extension after the due date will be permitted. If an assessment task is not submitted by the due date, a mark of 0 will be awarded.

Returning Assignments
Feedback via Wattle when the quiz results are made available.

Assessment Task 2: Assignment
Details of task:
This covers all material up to and including what is covered in the lectures of weeks 1-7. The students are expected to complete this assignment individually. Students will have to complete their assignment using a spreadsheet program like Microsoft Excel. The submission is online via Wattle. More details will be provided during the lectures and on Wattle. The assignment is compulsory and is worth 20% of your overall mark for this course.

Assignment Submission
All students must hand in an assignment of their own original work. The assignment is to be submitted online on Wattle at the pre-specified location. You must attach a coversheet with your assignment.

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Extensions and late submission of assessment pieces are covered by the Student Assessment (Coursework) Policy and Procedure.

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evidence that demonstrates you were not able to request an extension on or before the due date, you may be able to request it after the due date.

No submission of assessment tasks without an extension after the due date will be permitted. If an assessment task is not submitted by the due date, a mark of 0 will be awarded.

**Assessment Task 3: Final exam**

**Details of task:**
The final examination will be three hours long plus 15 minutes reading time and will cover the entire syllabus. It will count towards 70% of your final grade. Specific details regarding examination conditions and the time and location for this examination will be provided once confirmed.

**Examination material**
Details about the material or equipment that is permitted in an examination room will be provided in class and on Wattle.
https://wattlecourses.anu.edu.au/

**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.

**Exemption from Actuarial Professional examination**
The Australian National University is accredited by the Actuaries Institute (IAAust) to provide students with exemptions from the Part I professional examinations of the Institute. Exemptions are recommended subject to obtaining sufficiently high grades in designated courses.
This course provides for an exemption from the IAAust professional examination CT5. The standard for exemption is a Credit grade (60%) or higher.

**REQUIRED RESOURCES**
It is essential for students to obtain a copy of the book *Formulae and Tables for Actuarial Examinations (2002)*. This book will be used as a reference in completing exercises throughout this course, and is required for all assessment items. It can be purchased through the University Co-op bookshop or ordered directly through ACTED Australia (website: www.acted.com.au)

All other basic course materials will be available on the course website. This material includes lecture notes and tutorial exercises.
TUTORIAL AND/OR SEMINAR REGISTRATION

Tutorial signup for this course will be done via the Wattle website. Detailed information about signup times will be provided on Wattle or during your first lecture. When tutorials are available for enrolment, follow these steps:

1. Log on to Wattle, and go to the course site.
2. Click on the link “Tutorial enrolment”.
3. On the right of the screen, click on the tab “Become Member of ……” for the tutorial class you wish to enter.
4. Confirm your choice.

If you need to change your enrolment, you will be able to do so by clicking on the tab “Leave group…” and then re-enrol in another group. You will not be able to enrol in groups that have reached their maximum number. Please note that enrolment in ISIS must be finalised for you to have access to Wattle.

PRIVACY NOTICE

The ANU has made a number of third party, online, databases available for students to use. Use of each online database is conditional on student end users first agreeing to the database licensor’s terms of service and/or privacy policy. Students should read these carefully.

In some cases, student end users will be required to register an account with the database licensor and submit personal information, including their: first name; last name; ANU email address; and other information.

In cases where student end users are asked to submit ‘content’ to a database, such as an assignment or short answers, the database licensor may only use the student’s ‘content’ in accordance with the terms of service – including any (copyright) licence the student grants to the database licensor.

Any personal information or content a student submits may be stored by the licensor, potentially offshore, and will be used to process the database service in accordance with the licensors terms of service and/or privacy policy.

If any student chooses not to agree to the database licensor’s terms of service or privacy policy, the student will not be able to access and use the database. In these circumstances students should contact their lecturer to enquire about alternative arrangements that are available.

SUPPORT FOR STUDENTS

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

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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.

Other key policies include:

- Student Assessment (Coursework)
- Student Surveys and Evaluations

ACTUARIAL PROFESSION INFORMATION

Exemption from Actuarial Professional examination

The Australian National University is accredited by the Actuaries Institute to provide students with exemptions from the Part I professional examinations of the Institute. Exemptions are recommended subject to obtaining sufficiently high grades in designated courses. This course closely follows the syllabus of Subject CT5 of the IAAust.

To qualify for an exemption from the IAAust professional examination CT5, students are required to receive a mark of 60% or greater in this course. The standard required by the Institute of Actuaries of Australia for an exemption will be upheld and thus no quota applies to the percentage of students receiving each grade in this course.

University subscription to the Institute of Actuaries

The Institute of Actuaries of Australia (IAAust) allows students to become IAAust University Subscribers free of charge. Full time undergraduates studying at an Institute accredited university who are members of a university student actuarial society are eligible.

To sign up, go to: http://www.actuaries.asn.au/Membership/MembershipoftheInstitute/Subscriber.aspx

The University Subscriber offer is not a membership of the IAAust but a subscription to receive information on career opportunities, invitations to selected IAAust events and online publications. You might also consider joining the IAAust – there are advantages in doing so while a full-time student.

For membership information, go to http://www.actuaries.asn.au/Membership/MembershipoftheInstitute.aspx