Life Insurance Mathematics I

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Introduction

This module will follow on from the second-year course Survival Models I. We will consider some more general models for mortality, before moving on to the calculation of premiums and reserves.

Syllabus

- Selection and select life tables,
- actuarial functions using select life tables,
- net and gross premiums,
- with-profits policies,
- reserves,
- mortality profit.

Learning Outcomes

By the end of the course students should be able to:

- demonstrate an understanding of select mortality rates;
- construct a select-life mortality table;
- derive financial functions for select lives;
- calculate financial functions for benefits payable more frequently than annually;
- list the types of expenses incurred in writing a life insurance contract;
- describe the different types of bonus on a with-profits contract;
- calculate net and gross premiums for different types of life insurance and annuity contracts;

- calculate the mean and variance of the present-value of the profit on a simple policy or a portfolio of policies;
- calculate net and gross-premium reserves for different types of life insurance and annuity contracts;
- calculate the annual mortality profit on a group of policies.

Lectures and Tutorials

There will be three lectures each week for 9 weeks and one tutorial session on Tuesdays at 3.15pm except in week 1.
There will be no lecture or tutorial on Tuesday at 3.15pm.
A problem sheet will be handed out in advance of each tutorial. This should be completed in advance of the tutorial session. From time to time I may ask for homework to be handed in for marking.
Students should bring their copy of *Formulae and Tables for Actuarial Examinations* and a calculator along to all lectures and tutorials.

Assessment

Life Insurance Mathematics I is assessed in combination with Life Insurance Mathematics II and III in a single 3-hour written exam towards the end of term 3.

Office hours

If you have any problems with the course and are unable to resolve these during tutorials I will be available for consultation each Monday until 2.15pm.

Books

Essential
Formulae and Tables for Actuarial Examinations
Introduction to Survival Models, Volumes 1, 2 and 3 Hardy, Macdonald, Waters and McCutcheon.
Further reading
Life Assurance Mathematics by W.F.Scott.
Available from the Faculty or Institute of Actuaries offices or through their web site: `http://www.actuaries.org.uk`