

# Life Insurance Mathematics - Introduction

The seminar will be held as block course and is taught in English.

The course will provide you with essential skills for understanding common life insurance products covering the risk of death and longevity respectively for one and two individuals insured. You will learn how to calculate premiums and premium reserves and understand the calculation principles of life insurance products. The course will end with the ideas of profit sharing being assigned to holders of with-profit contracts.

The preliminary version of the table of contents shows the chapters projected and the technical terms as knowledge milestones.

## **Table of Contents (Status: January 2008)**

- Introduction
- Chapter 1: Elementary Mathematics of Finance  
Single and compound interest, cash flow, present value, accumulation value, internal rate of return, annuity certain, increasing annuity, perpetuity, payable in advance, payable in arrear, payable during the course of the year, payable continuously
- Chapter 2: Mortality  
Future lifetime, survival function, hazard rate, complete and curtate life expectancy, probability of death, probability of survival, life table, select and ultimate rates of mortality, uniform distribution of deaths, Joint life table functions
- Chapter 3: Premium Calculation  
Equivalence principle, commutation functions, expected present values of premiums and benefits, (increasing) life annuities and assurances, net premium, gross premium, expenses/premium loadings
- Chapter 4: Premium Reserves and Profit Sharing  
Policy values, prospective and retrospective calculation, surrender values, paid-up policy values, valuation basis 1<sup>st</sup> and 2<sup>nd</sup> order, mortality profit, terminal bonus
- Appendix 1: Helpful Formulae for Financial Calculations
- Appendix 2: Essentials in Probability

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