

MATH 3837 Actuarial Mathematics

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Time and Place: Monday 14:30-16:20 CEC803, Wednesday 8:30-9:20 OEM904

Office Hours: Monday 9:30 -12:20 and Wednesday 9:30-12:20 or by appointments

Teaching Assistant: **Email:**

Text Book:

- N. L. Bowers, et al, *Actuarial Mathematics*, Society of Actuaries, Schaumbury, Illinois, 1997.
- D. L. Long and G. A. Morton, *Principles of Life and Health Insurance*, 2th Ed., Life Management Institute LOMA, Atlanta, Georgia, 1988.

Reference:

- C. W. Jordan, Jr., *Life Contingencies*, The Society of Actuaries, (Last Edition).
- R. W. Batten, *Life Contingencies - A guide for Actuarial Student*, Prentice Hall, New Jersey, 1990.
- S. G. Kellison, *The Theory of Interest*, 2th Ed., Irwin/McGraw-Hill, 1991.

Prerequisite: MATH2206 Probability and Statistics and MATH2805 Mathematics of Compound Interest

Introduce: Life insurance forms part of the long-term insurance business written by life insurance companies. Life insurance companies provide a vital financial service to individuals and to firms who wish to insure themselves against financial losses that might be incurred as a result of any the following

death

survival to a particular time or over a particular period

sickness or disability

Life insurance companies issue contracts of insurance, contingent on any of the above events, which are long term or permanent (that is, the policyholder does not need to reapply for renewal of his/her contract after each year of cover, but is guaranteed renewal over the duration (term) of the contract, as agreed when the policy issued). Life insurance is an example of financial intermediation. The policyholder's financial asset can be changed dramatically through life insurance-e.g., by converting a regular investment (or premium) into a term assurance benefit. Other contracts make a less material alternation to the policyholder's asset: for example, unit-linked policyholders accumulate a share in a specified pool of asset in much the same way as the policyholder could accumulate funds directly, without the intermediation of the insurance company.

Objectives: To introduce the theory of life insurance and life contingencies with application to insurance problems. Student will learn some of the major issue in the field of actuaries including the measurement of mortality, life annuities, life insurance and net annual premiums.

Subject Content in Outline

- Nature of Life Insurance
- Measurement of Mortality
- Life Annuities
- Life Insurance
- Premiums
- Reserves

Homework: Problems will be assigned at class meetings and will be due in class on Tuesday of following weeks. No late homework will be accepted. Missed homework will receive a grade zero. The homework will be graded, and each assignment carries equal weight. Verbatim copying of homework is absolutely *forbidden*.

Assessment:

- Continuous Assessment (30%)
- Final Examination (70%)