

On-line course materials

# MATH20972 - Actuarial Insurance

Year: 2 - Semester: 2 - Credit Rating: 10

## Requisites

### *Prerequisites*

MATH10141 Probability 1

MATH20701 Probability 2

## Aims

The aim of this unit is to provide to students a further grounding in several stochastic and statistical techniques of particular relevance to the non-life insurance industry.

## Brief Description

This course unit provides a basic knowledge of some of the major notions and models of probability and statistics which are particularly relevant to non-life insurance. The course covers part of Subject CT6, one of the core technical modules from the educational program of the Actuarial Profession.

## Learning Outcomes

Upon successful completion, the students are expected to be able to describe, fully understand and apply the notions and models developed during the course. This concerns both the mathematical techniques and the actuarial interpretation.

## Syllabus

1. Decision Theory. Two person zero sum games, randomised strategies, saddle points, statistical games (with data), Bayes criterion, minimax criterion.
2. Loss Distributions. Properties of loss distributions, actuarial interpretation, effect of different types of reinsurance.
3. Run-off triangles. Several methods for computing required reserves in the context of run-off triangles.

4.Risk models. Aggregated claim amounts modeled by compound distributions in elementary and more advanced form, results about their moment generating functions/moments etc., several standard compound distributions, effect of different types of reinsurance.

5.Monte Carlo methods. The basics of the Monte Carlo simulation method: simulation using the cdf and acceptance-rejection, variance reduction techniques etc.

## Teaching & Learning Process (Hours Allocated To)

<b>Lectures</b>	<b>Tutorials/ Example Classes</b>	<b>Practical Work/ Laboratory</b>	<b>Private Study</b>	<b>Total</b>
22	11	0	67	100

## Assessment and Feedback

1.Coursework 20%

2.Examination at the end of the semester, two hours duration, 80%.

## Further Reading

- Core Reading: Subject CT6, Statistical Methods. Produced by the Actuarial Education Company ([www.acted.co.uk](http://www.acted.co.uk)).
- Loss models: from data to decisions (2008), third edition. Stuart A. Klugman, Harry H. Panjer and Gordon E. Willmot.
- Monte Carlo Methods in Financial Engineering (2004). Paul Glasserman.
- Non-life Insurance Mathematics. An Introduction with Stochastic Processes (2004),second edition. Thomas Mikosch.

## Staff Involved

Dr Kees Van schaik - Lecturer

Data source is EPS system

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