MODULE SPECIFICATION – UNDERGRADUATE PROGRAMMES

KEY FACTS

Module name	Statistics and Probabilistic Modelling for Insurance
Module code	AS3106
School	Cass Business School
Department or equivalent	UG Programme
UK credits	30
ECTS	15.0
Level	6
Delivery location (partnership programmes only)	

MODULE SUMMARY

Module outline and aims

This course comprises the basic modelling platform which allows you to understand how insurance and reinsurance operate, to be able to price insurance products and services and, by considering appropriate risk and performance measures, to be able to assess the financial implications and risks for the insurance and reinsurance companies. It provides the opportunity to earn an exemption from the Institute and Faculty of Actuaries' Core Technical subject 6.

This course is aiming at providing you with a basic knowledge of the major notions and models of probability and statistics, used in the context of general insurance, life insurance and pensions.

Content outline

- Elements of probability theory.
- Loss distributions Risk models Bayesian statistics Time Series analysis.
- Experience rating and no-claim discount systems.
- Claims reserving in general insurance (analysis of run-off triangles) Monte Carlo simulation.
- Elements of decision theory.
- Generalised Linear Models.

Pre-requisite Module
AS2101 Probability & Statistics 2

WHAT WILL I BE EXPECTED TO ACHIEVE?

On successful completion of this module, you will be expected to be able to:

Knowledge and understanding:

- Understand probability and statistics and how they are applied in modelling for the

purpose of premium rating, reserving, measuring the risk and performance of insurance and reinsurance companies.

- Understand credibility theory and how it is applied to estimate the pure premium of an insurance contract

- Understand the construction of risk models for the purpose of estimating the aggregate claim amount

- Understand the evaluation of the probability of ruin of an insurance company under the classical risk model and how to use it as a measure of the risk taken by the insurance company

- Understand the assessment of the claims reserves necessary for the safe and sound operation of a general insurance company

- Understand simple experience rating systems, based on claim frequency, e.g. the no claims discount system

- Understand Bayesian statistics, generalized linear models and decision making

- Demonstrate knowledge of how the assumptions of the models and methods taught can be extended and new, more general, insurance and reinsurance models and results can be obtained.

Skills:

- Translate problems, stated in practical insurance terms, into problems stated in probabilistic and risk theoretic terms, thus formalizing and then solving the problems.

- Present your solutions and communicate actuarial valuation results to non-actuaries

- Describe the models and concepts, studied in the course, in the context of preparing actuarial reports on calculating premiums, setting reserves, reinsurance retention levels and other quantities of actuarial interest.

- Explain in simple practical terms the formal solutions obtained using the modelling methodology taught in the course.

Values and attitudes:

- Have confidence in applying the methodology taught in the course to solving concrete problems of premium rating, reserving and assessing risk and performance of insurance companies.

- Demonstrate awareness of the importance of the results and methods of probability theory and statistics relevant to insurance, and how they can be successfully applied in constructing actuarial models in insurance and reinsurance

HOW WILL I LEARN?

Lectures.

Teaching pattern:

Teaching component	Teaching type	Contact hours	Self-directed study hours	Placement hours	Total student learning hours
Lectures	Lecture	60	240	0	300
TOTALS:		**60**	**240**	**0**	**300**

WHAT TYPES OF ASSESSMENT AND FEEDBACK CAN I EXPECT?

Assessments

Coursework and exam.

Assessment pattern:

Assessment component	Assessment type	Weighting	Minimum qualifying mark	Pass/Fail?
Coursework 1	Written assignment, including essay	20	0	N/A
Exam (3 hours)	Written Exam	80	0	N/A

Assessment criteria

Assessment Criteria are descriptions of the skills, knowledge or attributes students need to demonstrate in order to complete an assessment successfully and Grade-Related Criteria are descriptions of the skills, knowledge or attributes students need to demonstrate to achieve a certain grade or mark in an assessment. Assessment Criteria and Grade-Related Criteria for module assessments will be made available to students prior to an assessment taking place. More information will be available from the module leader.

Feedback on assessment

Following an assessment, students will be given their marks and feedback in line with the Assessment Regulations and Policy. More information on the timing and type of feedback that will be provided for each assessment will be available from the module leader.

Assessment Regulations

The Pass mark for the module is 40%. Any minimum qualifying marks for specific assessments are listed in the table above. The weighting of the different components can also be found above. The Programme Specification contains information on what happens if you fail an assessment component or the module.

INDICATIVE READING LIST

Modern Actuarial Risk Theory, R Kaas, M Goovaerts, J Dhaene and M Denuit (Kluwer Academic Publishers, 2001).

Official Core Reading - Subject CT6, (Institute and Faculty of Actuaries, updated annually).

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Appendix: *see http://www.hesa.ac.uk/content/view/1805/296/ for the full list of JACS codes and descriptions*

CODES

HESA Code	Description	Price Group
24	Mathematics	C

JACS Code	Description	Percentage (%)
N323	The application of statistical concepts within the financial industry.	100