Subject Description Form

Subject Code	AMA4363
Subject Title	Loss Models
Credit Value	3
Level	4
Pre-requisite	Statistical Inference (AMA364) or Statistical Inference (AMA3640)
Exclusion	Loss Models (AMA463)
Objectives	This subject is to enable students to understand the theory and applications of actuarial loss models.
Intended Learning Outcomes	Upon satisfactory completion of the subject, students should be able to: a. demonstrate the understanding of the concepts and terminology of actuarial loss models; b. integrate the knowledge and techniques in statistical inference, probability models and risk theory to analyze survival and loss data; c. command advanced knowledge and techniques in estimation, evaluation, and selection of loss models; d. apply the acquired knowledge and techniques to analyze statistical data arising from insurance and financial markets
Subject Synopsis/ Indicative Syllabus	*Concepts and models (11 hours)* Loss amount and claim payment, deductible and maximum limit, censored and truncated data, grouped data, loss distributions subject to censoring and/or truncation, failure rates and hazard functions, parametric and nonparametric models, loss models with covariates, Cox proportional hazard model. *Statistical Inference (28 hours)* Statistical inference based on censored, truncated, and/or grouped data, nonparametric and parametric estimations of loss distributions, empirical estimation, Kaplan-Meier estimator, Nelson-Aalen estimator, kernel smoothing, method of moments, percentile matching, maximum likelihood estimation, variance of estimators, information matrix, delta method, linear and log-transformed confidence intervals, goodness of fit, likelihood ratio test, Kolmogorov-Smirnov test, chi-squared test, selection of loss models, Bayesian-Schwarz criterion, estimation of models with covariates, full and partial likelihoods.

Teaching/Learning Methodology

The subject will be delivered mainly through lectures and tutorials. The lectures will be conducted to introduce the concepts of loss models of the topics in the syllabus, which are then reinforced by learning activities involving demonstration, tutorial exercise and assignments.

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)			
		a	b	c	d
1. Assignments	15%	✓	✓	✓	✓
2. Tests	25%	✓	✓		
3. Examination	60%	✓	✓	✓	✓
Total	100 %				

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:
The subject focuses on knowledge, skill and understanding of **Loss Models**, thus, **Exam-based assessment** is the most appropriate assessment method, including 25% test and 60% examination. Moreover, 15% worth of assignments are included as a component of continuous assessment so as to keep the students in progress.
Continuous Assessment comprises of assignments and tests. A written examination is held at the end of the semester.

Student Study Effort Expected

Class contact:	
▪ Lecture	26 Hrs.
▪ Tutorial	13 Hrs.
Other student study effort:	
▪ Assignment	30 Hrs.
▪ Self-study	36 Hrs.
Total student study effort	105 Hrs.

Reading List and References

Textbook:

Klugman, S.A., Panjer, H.H. & Willmot, G.E.	Loss Models: From Data to Decisions 4th edition	Wiley 2012

References:

London, D.	Survival Models and Their Estimation 3rd edition	ACTEX Publications, 1997
Smith, P.J.	Analysis of Failure and Survival Data	Chapman & Hall, 2002