Subject Description Form

Subject Code	AMA469
Subject Title	Survival Analysis and Loss Models
Credit Value	3
Level	4
Pre-requisite/ Co-requisite/ Exclusion	Pre-requisites: Statistical Inference (AMA364)
Objectives	To enable students to understand the theory and applications of survival analysis and actuarial loss models.
Intended Learning Outcomes	Upon satisfactory completion of the subject, students should be able to: 1. apply the concepts and terminology of survival analysis and loss models; 2. integrate the knowledge and techniques in statistical inference, probability models and risk theory to analyze survival and claim data; 3. command advanced knowledge and techniques in estimation, evaluation, and selection of actuarial models; 4. apply the acquired knowledge and techniques to analyze statistical data arising from life science, insurance, and financial markets.
Subject Synopsis/ Indicative Syllabus	*Concepts and models* Time to occurrence of an event, censored and truncated data, grouped data, survival and loss distributions subject to censoring/truncation, failure rates and hazard functions, parametric and nonparametric survival/loss models, loss models with covariates, Cox proportional hazard model. *Statistical Inference* Statistical inference based on censored, truncated, and/or grouped data, estimation of survival/loss distributions using parametric and nonparametric methods, Kaplan-Meier estimators, Nelson-Aalen estimators, maximum likelihood estimation, confidence intervals and confidence bands, goodness of fit tests, likelihood ratio test, Kolmogorov-Smirnov test and chi-squared test, selection of loss models, Bayesian-Schwarz criterion, estimation of models with covariates, full and partial likelihoods.
Teaching/Learning Methodology	The learning outcomes will be achieved through a combination of lectures, tutorials, interactions between the lecturers and students, assignments, tests and the final examination.

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)			
		1	2	3	4
a Assignments	10%	✓	✓	✓	✓
b Tests	30%	✓	✓	✓	✓
c Examination	60%	✓	✓	✓	✓
Total	100 %				

Continuous Assessment comprises of assignments and tests. A written examination is held at the end of the semester.

The learning outcomes will be assessed by a combination of assignments, mid-term tests and the final examination.

To pass this subject, students are required to obtain Grade D or above in **both** the Continuous Assessment and the Examination components.

Student Study Effort Required

Class contact:	
▪ Lecture	28 Hrs.
▪ Tutorial	14 Hrs.
Other student study effort:	
▪ Assignment	20 Hrs.
▪ Self-study	58 Hrs.
Total student study effort	120 Hrs.

Reading List and References

Textbook:

Klugman, S.A., Panjer, H.H. and Willmot, G.E.	Loss Models: From Data to Decisions, 3rd Edition	Wiley, 2008

Reference:

Klugman, S.A.	Estimation, Evaluation, and Selection of Actuarial Models	SOA Study manual, 2002