Subject Description Form

Subject Code	AMA470
Subject Title	Credibility Theory
Credit Value	3
Level	4
Pre-requisite/ Co-requisite/ Exclusion	Pre-requisite: Statistical Inference (AMA364)
Objectives	This subject is to enable students to understand credibility theory in actuarial science.
Intended Learning Outcomes	Upon satisfactory completion of the subject, students should be able to: 1. apply the necessary and sophisticated mathematical techniques for credibility theory in actuarial science; 2. command the knowledge and techniques of the credibility models to assess the insurance and financial risks from past claim experience; 3. apply the acquired knowledge and techniques to calculate insurance premiums based on past claim history.
Subject Synopsis/ Indicative Syllabus	*Preliminary*: *(12 hours)* Joint, conditional, and mixed (marginal) distributions, unbiased and linear estimators, Bayesian methodology, prior and posterior distributions, conjugate prior distributions, the linear exponential family, compound distributions. *Theory and models*: *(21 hours)* Concept of credibility in actuarial science, greatest accuracy credibility theory, Bayesian premium, linear approximation, normal equations, credibility premium, Bühlmann model, Bühlmann-Straub model and extensions, exact credibility. *Estimation*: *(9 hours)* Structural parameters, empirical Bayes estimation, unbiased estimation, nonparametric, semiparametric, and full parametric estimates.
Teaching/Learning Methodology	The subject will be delivered mainly through lectures and tutorials. The lectures will be conducted to introduce the credibility theory concepts 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)		
		1	2	3
a. Assignments	20%	✓		✓
b. Quizzes/Tests	20%	✓		✓
c. Examination	60%	✓	✓	✓
Total	100 %			

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

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	40 Hrs.
▪ Self-study	30 Hrs.
Total student study effort	112 Hrs.

Reading List and References

Textbook:

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

References:

Bühlmann, H. & Gisler, A.	A Course in Credibility Theory and its Application 1st edition	Springer 2005
Mahler, H.C. & Dean, C.G.	"Credibility" In Foundations of Casualty Actuarial Science 4th edition	Arlington, VA: Casualty Actuarial Society 2001: 485-659