Annexe A: New/Revised Course Content in OBTL+ Format

Course Overview

The sections shown on this interface are based on the templates UG OBTL+ or PG OBTL+
If you are revising/duplicating an existing course and do not see the pre-filled contents you expect in the subsequent sections e.g. Course Aims, Intended Learning Outcomes etc. please refer to Data Transformation Status for more information.

Expected Implementation in Academic Year	AY2024/2025
Semester/Trimester/Others (specify approx. Start/End date)	Semester 1
Course Author * Faculty proposing/revising the course	Zhu Wenjun
Course Author Email	wjzhu@ntu.edu.sg
Course Title	ACTUARIAL STATISTICS
Course Code	BA3202
Academic Units	4
Contact Hours	52
Research Experience Components	Not Applicable

Course Requisites (if applicable)

Pre-requisites	BA2203 Statistical Modelling
Co-requisites	
Pre-requisite to	
Mutually exclusive to	
Replacement course to	
Remarks (if any)	

Course Aims

The aim of this course is to furnish an extensive coverage of advance actuarial statistical knowledge to solve actuarial problems in general insurance. It helpsstudents develop the necessary judgmental and professional skills to apply actuarial principles to practical circumstances.This course is suitable for actuarial science students, as well asstudents of other majors, such as mathematics, statistics, and data science, who plan to work in the risk management and insurance profession. The course will give a solid grounding for understandingactuarial modelingtechniques which will be needed in later studies.Thiscourse provides students appropriate tools andtechniques that are useful in their future actuarial practice. This course will also cover some principles of actuarial professionalismby introducing professional and statutory requirements that will benefit the students'future career.

Course's Intended Learning Outcomes (ILOs)

Upon the successful completion of this course, you (student) would be able to:

ILO 1	Interpret the key concepts, models, and theories in statistical modeling in general insurance.
ILO 2	Choose appropriate advanced statistical models for insurance data sets.
ILO 3	Estimate the advanced statistical models for insurance data sets.
ILO 4	Propose possible improvements to existing models with critical analysis possible improvements.
ILO 5	Design statistical tests to solve actuarial problems with a hypothesis.
ILO 6	Evaluate solutions in different scenarios with simulations.

Course Content

The topics covered include Bayesian statistics, decision theory, loss distributions, risk models, reinsurance,credibility theory,time series models, generalized linear models, introduction to copulas, extreme value theory and introduction to machine learning.

Reading and References (if applicable)

Basic Reading •Coursenotes. Readings and References •CS1 –Actuarial Statistics 1. •CS2 –Actuarial Statistics 2. •Study material and relevant curriculum information can be found at http://www.actuaries.org.uk/.

Planned Schedule

Week or Session	Topics or Themes	ILO	Readings	Delivery Mode	Activities
1	Decision Theory, Bayesian Statistics	1-6	Handouts & Practice Question Sets		
2	Loss distributions	1-6	Handouts & Practice Question Sets		
3	Reinsurance	1-6	Handouts & Practice Question Sets		
4	Credibility, Empirical Bayes Credibility Theory	1-6	Handouts & Practice Question Sets		
5	Generalized linear models	1-6	Handouts & Practice Question Sets		
6	Risk models	1-6	Handouts & Practice Question Sets		
7	Time series models(I)	1-6	Handouts & Practice Question Sets		
8	Recess				
9	Midterm Quiz	1-6	Handouts & Practice Question Sets		
10	Time series models (I)	1-6	Handouts & Practice Question Sets		
11	Time series models (II)	1-6	Handouts & Practice Question Sets		
12	Copulas	1-6	Handouts & Practice Question Sets		
13	Machine learning	1-6	Handouts & Practice Question Sets		
14	Final Revision	1-6	Handouts & Practice Question Sets		

Learning and Teaching Approach

Approach	How does this approach support you in achieving the learning outcomes?
Seminars	Key concepts introduced in this module will be explained in detail in the seminars supported with examples and exercises. The seminars provide opportunities for open discussion on the conceptual questions, which allow you to think critically and share your ideas with the class. The seminars involve the interaction between the instructor and the entire class, making sure that the targeted learning outcomes could be successfully achieved.
In-Class activities	In-class activities, including questions & answers, going through tutorial questions, discussions, etc., provides you hands-on experience to apply materials and concepts introduced in this module to practice of the risk management and insurance practice. Such in-class activities guarantee that learning outcomes could be satisfying achieved.

Assessment Structure

Assessment Components (includes both continuous and summative assessment)

No.	Component	ILO	Related PLO or Accreditation	Weightage	Team/Individual	Rubrics	Level of Understanding
1	Summative Assessment (EXAM): Final exam()	3,4,5	Acquisition of knowledge	70	Individual	Holistic	Multistructural
2	Continuous Assessment (CA): Class Participation()	1,2,6	Communication; Acquisition of knowledge; Problem Solving & Decision Making_x000D_	10	Individual	Holistic	Multistructural
3	Continuous Assessment (CA): Test/Quiz(Mid-term quiz)	1,3,4,5	Communication, Acquisition of knowledge	10	Individual	Holistic	Multistructural
4	Continuous Assessment (CA): Presentation(Group Presentation)	1,2,3,4,5,6		10	Team	Holistic	Multistructural

Description of Assessment Components (if applicable)

The 70% weightage for final is required by the accreditation agreement with the IFOA.

Formative Feedback

You will receive verbal feedback through in-class discussion to your course participation. You will receive written summative feedback on the mid-term quiz.You will receive summative group feedback on the exam following the conclusion of the module.

NTU Graduate Attributes/Competency Mapping

This course intends to develop the following graduate attributes and competencies (maximum 5 most relevant)

Attributes/Competency	Level
Collaboration	Advanced
Communication	Advanced
Decision Making	Advanced
Problem Solving	Advanced
Critical Thinking	Advanced

Course Policy

Policy (Academic Integrity)

Good academic work depends on honesty and ethical behaviour. The quality of your work as a student relies on adhering to the principles of academic integrity and to the NTU Honour Code, a set of values shared by the whole university community. Truth, Trust and Justice are at the core of NTU's shared values. As a student, it is important that you recognize your responsibilities in understanding and applying the principles of academic integrity in all the work you do at NTU. Not knowing what is involved in maintaining academic integrity does not excuse academic dishonesty. You need to actively equip yourself with strategies to avoid all forms of academic dishonesty, including plagiarism, academic fraud, collusion and cheating. If you are uncertain of the definitions of any of these terms, you should go to the academic integrity website for more information. On the use of technological tools (such as Generative AI tools), different courses / assignments have different intended learning outcomes. Students should refer to the specific assignment instructions on their use and requirements and/or consult your instructors on how you can use these tools to help your learning. Consult your instructor(s) if you need any clarification about the requirements of academic integrity in the course.

Policy (General)

You are expected to attend all seminar classes punctually and take all scheduled assignments and tests by due dates.All course related materials will be uploaded on NTULearn.You are expected to take responsibility to follow up with course notes, assignments and course related announcements for seminar sessions. You are expected to participate in all seminar discussions and activities.

Policy (Absenteeism)

Absence from class without a valid reason will affect your overall course grade. Valid reasons include falling sick supported by a medical certificate and participation in NTU's approved activities supported by an excuse letter from the relevant bodies. If you miss a lecture, you must inform the course instructor via email prior to the start of the class.

Policy (Others, if applicable)

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