



ACTOPIC – Actuarial Topics
Prerequisite: LIFECO1

Prerequisite to: _____

Instructor: _____
Consultation Hours: _____

Contact details: _____
Class Schedule and Room: _____

Course Description

This is a two part course on selected topics in Actuarial Science

Learning Outcomes	
On completion of this course, the student is expected to present the following learning outcomes in line with the Expected Lasallian Graduate Attributes (ELGA)	
ELGA	Learning Outcome
Critical and Creative Thinker Effective Communicator Lifelong Learner Service-Driven Citizen	Develop an understanding and appreciation of specialized linear programming concepts (integer LP, transportation and assignment models, network models) and unconstrained and constrained optimization as effective tools in addressing real world problems especially those that are relevant to decision making in business, economics and other related areas.

Final Course Output		
As evidence of attaining the above learning outcomes, the student is required to submit the following during the indicated dates of the term.		
Learning Outcome	Required Output	Due Date
At the end of the course, the student will apply appropriate mathematical and statistical concepts and processes in modeling and analysis of loss models. Furthermore, at the end of the course, the student will have an understanding of poisson processes and how it is applied to actuarial science problems.	Analysis of a real life data which is a poisson process/markov chain.	Week 13

Rubric for assessment				
<i>Written Group Report</i>				
CRITERIA	Excellent (4)	Good (3)	Satisfactory (2)	Needs Improvement (1)
Content	Demonstrates in-depth understanding of concepts and skills with no error	Demonstrates understanding of concepts and skills with one or two errors	Demonstrates some understanding of concepts and skills with minimal errors	Demonstrates minimal understanding of concepts and skills with so many errors
Organization	Presented concepts/skills which were logically organized with complete supporting ideas	Presented concepts/skills which were logically organized with some supporting ideas	Presented concepts/skills which were minimally organized with minimal supporting ideas	Presented concepts/skills which were poorly organized and lacked supporting evidence
Integration	Demonstrates integration of the concepts presented	Demonstrates some integration of the concepts presented	Demonstrates limited integration of the concepts presented	Demonstrates no integration of the concepts presented
Accuracy of Computations /Solutions	Computations/solutions are correct and explained correctly	Computations/solutions are correct but not explained well.	Computations/solutions have some errors.	Incorrect computations /solutions

Overall Presentation and creativity	Overall presentation is creative and artistic with innovative ideas	Overall presentation shows some effort in its creativity and artistic value with some innovative ideas	Overall presentation shows limited effort in its creativity and artistic value with limited innovative ideas	Overall presentation is neither creative nor artistic with no innovative ideas
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Group Member Assessment

Criteria	Excellent/4	Good/3	Satisfactory/2	Needs Improvement/1
Contribution	Group member completed an equal share of work and strived to maintain that equity throughout the project	Group member contributed significantly, but other members clearly contributed more	Group member contributed little toward the project	Group members contributions were insignificant or nonexistent
Dependability	Group member provided contributions with 100% punctuality and always appeared for group work	Group member contributions were mostly punctual and almost always appeared for group work	Group member contributions were regularly late and often missed scheduled group work	Group member was undependable forcing other members to take up the slack
Efficiency	Work performed was very useful and contributed significantly to the final product	Participation was inefficient and thus contributions were less than expected	Work performed was inappropriate and mostly useless toward the final product	Work performed was completely ineffective and useless in the final product
Attitude	Group member was very positive and pleasant to work with	Group member didn't complain but offered little enthusiasm	Group member sometimes complained and was somewhat of a burden	Group member often complained and generally demoralized the group

Additional Requirements

Aside from the learning output, the student will be assessed at other times during the term by the following:

- Skills Check (Seatwork/Quizzes/Boardwork)
- Individual/Group Report
- Individual/Group Problem Set

Grading System

	FOR EXEMPTED STUDENTS (w/out Final Exam)	FOR STUDENTS with FINAL EXAM		Scale:
		<i>with no missed quiz</i>	<i>With one missed quiz</i>	
Average of quizzes & Project	90%	60%	50%	95-100% 4.0 89-94% 3.5 83-88% 3.0 78-82% 2.5 72-77% 2.0 66-71% 1.5 60-65% 1.0 <60% 0.0
Project, Seatwork and Assignment	10%	10%	10%	
Final exam		30%	40%	

Learning Plan

Learning Outcome	Culminating Topics	Week No.	Learning Activities	
PART I: Introduction to Stochastic Calculus				
At the end of the course, the student will have an understanding of poisson processes and how it is applied to actuarial science problems	I MARKOV CHAINS 1.1 Stochastic processes 1.2 Random walk 1.3 Markov chains 1.4 Classification of states	Week 1-2	Group Work Problem Sets Library Work Computer Laboratory Work	
	II. POISSON PROCESSES 2.1 Exponential and gamma distributions 2.2 Poisson process 2.3 Interarrival Times 2.4 Superposition and decomposition of a poisson process 2.5 Nonhomogenous poisson process 2.6 Compound poisson process	Week 3-5		
	III BROWNIAN MOTION 3.1 Normal distribution and the central limit thorem 3.2 Brownian motion	Week 6-7		
	Examination for Part I.			
	PART II: Loss Models			
	VI. INTRODUCTION 6.1 Actuarial Models 6.2 Moments 6.3 Percentiles 6.4 Generating Functions and Sums of Random Variables	Week 8	Group Work Problem Sets Library Work Computer Laboratory Work	
	V. CLASSIFYING AND CREATING DISTRIBUTIONS 5.1 Parametric and scale distributions 5.2 Parametric distribution families 5.3 Finite mixture distributions 5.4 Data dependent distributions 5.5 Tail Weight (Limiting ratios and hazard rate and mean residual life patterns) 5.6 Creating new distributions by multiplication of a constant; by raising a power; by exponentiation and mixing and splicing 5.7 Limiting distributions	Week 9-11		
VI. CALCULATIONS INVOLVING COVERAGE MODIFICATIONS 6.1 Deductibles 6.2 Loss elimination ratio 6.3 Effects of inflation for ordinary deductibles 6.4 Limits 6.5 Coinsurance	Week 12-13			
Examination for Part II				

References

Bowers, N.L. et al (1986). *Actuarial Mathematics*. Itasca: Society of Actuaries. Klugman, S.A., Panjer, H.H., & Willmot, G.G. (2004) *Loss Models: From Data to Decisions* (2nd ed). Hoboken: Wiley-Interscience.
Ross, S.M. (2003). *Introduction to Probability Models* (8th ed). San Diego: Academic Press

Online Resources

Class Policies

1. The required minimum number of quizzes for a 3-unit course is 3, and 4 for 4-unit course. No part of the final exam may be considered as one quiz.
2. Cancellation of the lowest quiz is not allowed even if the number of quizzes exceeds the required minimum number of quizzes.
3. As a general policy, no special or make-up tests for missed exams other than the final examination will be given. However, a faculty member may give special exams for
 - A. approved absences (where the student concerned officially represented the University at some function or activity).
 - B. absences due to serious illness which require hospitalization, death in the family and other reasons which the faculty member deems meritorious.
4. If a student missed two (2) examinations, then he/she will be required to take a make up for the second missed examination.
5. If the student has no valid reason for missing an exam (for example, the student was not prepared to take the exam) then the student receives 0% for the missed quiz.
6. Students who get at least 89% in every quiz are exempted from taking the final examination. Their final grade will be based on the average of their quizzes and other prefinal course requirements. The final grade of exempted students who opt to take the final examination will be based on the prescribed computation of final grades inclusive of a final examination. Students who missed and/or took any special/make-up quiz will not be eligible for exemption.
7. Learning outputs are required and not optional to pass the course.
8. Mobile phones and other forms of communication devices should be on silent mode or turned off during class.
9. Students are expected to be attentive and exhibit the behavior of a mature and responsible individual during class. They are also expected to come to class on time and prepared.
10. Sleeping, bringing in food and drinks, and wearing a cap and sunglasses in class are not allowed.
11. Students who wish to go to the washroom must politely ask permission and, if given such, they should be back in class within 5 minutes. Only one student at a time may be allowed to leave the classroom for this purpose.
12. Students who are absent from the class for more than 5 meetings will get a final grade of 0.0 in the course.
13. Only students who are officially enrolled in the course are allowed to attend the class meetings.

Approved by:

DR. ARTURO Y. PACIFICADOR, JR.
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