



DE LA SALLE UNIVERSITY  
College of Science  
Department of Mathematics



**LIFECO1** – *Life Contingencies 1*

*Prerequisite: STATHE1, THEOINT*

*Prerequisite to: LIFECO2, RISKTHE*

**Instructor:** \_\_\_\_\_

**Contact details:** \_\_\_\_\_

**Consultation Hours:** \_\_\_\_\_

**Class Schedule and Room:** \_\_\_\_\_

### Course Description

This is course for Actuarial Science students that covers the measurement of mortality, life annuities, life insurance, benefit premiums and benefit reserves for single life functions.

### 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)

|                                     |   |  |  |  |
|-------------------------------------|---|--|--|--|
| Solutions                           | explained correctly   | explained well.  |  | /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 |

**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   |  |   |

|  |   |                        |  |  |
|--|---|------------------------|--|--|
| the modeling of actuarial science variables and concepts in the construction of life tables involving single life functions. | 1.3 Force of Mortality<br>1.4 Life Table and Life Table functions<br>1.5 Deterministic survivorship group<br>1.6 Assumptions on fractional ages (Linear, Exponential, Harmonic)<br>1.7 Some Analytical Laws of Mortality (De Moivre, Gompertz, Makeham)   |                        |  |  |
|  | <b>II. LIFE INSURANCE</b><br>The present value random variable Z<br>Insurances payable at the moment of death (Level benefit and varying benefit)<br>Insurances payable at the end of the year of death (Level benefit and varying benefit)<br>Relationship between insurances payable at the end of the year of death and at the moment of death | Week 4-6<br>(9 hours)  |  |  |
|  | <b>III. LIFE ANNUITY</b><br>The Present Value random variable Y<br>The current payment technique and the aggregate payment technique in finding the actuarial present value of a life annuity<br>Continuous life annuity<br>Discrete life annuities<br>Life annuities with mthly payments<br>Apportionable annuities                              | Week 6-9<br>(9 hours)  |  |  |
|  | <b>IV. BENEFIT PREMIUMS</b><br>The Equivalence Principle<br>Fully continuous premiums<br>Fully discrete premiums<br>True mthly payment premiums<br>Apportionable premiums   | Week 9-11<br>(9 hours) |  |  |
|  | <b>IV. BENEFIT RESERVES</b><br>5.1 Fully continuous benefit   |                        |  |  |



## References

Bowers, Gerber, Hickman, Jones and Nesbitt., (1997).

