

Subject Description Form

Subject Code	AMA533
Subject Title	Life Contingencies
Credit Value	3
Level	5
Pre-requisite/ Co-requisite/ Exclusion	Pre-requisite: AMA528 Probability and Stochastic Models
Objectives	To enable students to have a working knowledge of life contingencies and equip students with some advanced theory and models in long term actuarial mathematics.
Intended Learning Outcomes	<p>Upon completion of the subject, students will be able to:</p> <ul style="list-style-type: none"> (a) Understand key concepts in survival models and construct the associated life tables. (b) Describe different types of life insurance and annuities. (c) Calculate benefit premiums and benefit reserves in life insurance and annuities. (d) Analyze the life insurances and annuities in multi-life models and in models with multiple decrements.
Subject Synopsis/ Indicative Syllabus	<p>Survival models and survival distributions, life tables.</p> <p>Life insurance: insurance payable at the moment of death, insurance payable at the end of the year of death, some related differential equations.</p> <p>Life annuities: continuous life annuities, discrete life annuities, life annuities with m-thly payments.</p> <p>Net premiums: fully continuous premiums, fully discrete premiums, true m-thly payment premiums, other types of premiums and benefits.</p> <p>Benefit reserves: fully continuous benefit reserves, fully discrete benefit reserves, benefit reserves on a semi-continuous basis, benefit reserves based on true m-thly benefit premiums.</p> <p>Multiple life functions and multi-state models: joint distribution of future lifetimes, the joint-life status, the last-survivor status, dependent lifetime models, insurance and annuity benefits, special mortality assumptions.</p> <p>Multiple decrement models: random survivorship group, deterministic survivorship group, decrement tables, applications of decrement theory.</p>

Teaching/Learning Methodology	The subject will be delivered mainly through lectures and tutorials. The teaching and learning approach is mainly problem-solving oriented. The approach aims at the development of mathematical techniques and how the techniques can be applied to solving problems. Students are encouraged to adopt a deep study approach by employing high level cognitive strategies, such as critical and evaluative thinking, relating, integrating and applying theories to practice.																																															
Assessment Methods in Alignment with Intended Learning Outcomes	<table border="1" data-bbox="491 472 1401 947"> <thead> <tr> <th rowspan="2">Specific assessment methods/tasks</th> <th rowspan="2">% weighting</th> <th colspan="4">Intended subject learning outcomes to be assessed (Please tick as appropriate)</th> </tr> <tr> <th>a</th> <th>b</th> <th>c</th> <th>d</th> </tr> </thead> <tbody> <tr> <td>1. Assignments</td> <td>20%</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>2. Mid-term Test</td> <td>20%</td> <td>✓</td> <td>✓</td> <td>✓</td> <td></td> </tr> <tr> <td>3. Examination</td> <td>60%</td> <td>✓</td> <td>✓</td> <td>✓</td> <td>✓</td> </tr> <tr> <td>Total</td> <td>100 %</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p data-bbox="491 981 1401 1048">Continuous Assessment comprises of assignments and tests. A written examination is held at the end of the semester.</p>						Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)				a	b	c	d	1. Assignments	20%	✓	✓	✓	✓	2. Mid-term Test	20%	✓	✓	✓		3. Examination	60%	✓	✓	✓	✓	Total	100 %												
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	Leung, B.P.K., and Shiu, E.S.W.	Hattendorff Theorem	<i>Actuarial Journal</i> , 7 no. 1 (2003), 38- 47.
	Jordan, C. W.	Life Contingencies, 2nd Edition	Society of Actuaries, 1967