

OFFICIAL SYLLABUS

STAT 486 – ACTUARIAL MATHEMATICS

(Adopted Fall 2003; Committee: Drs. Z. Agustin, S. Rigdon, A. Neath)

Catalog Description: Utility theory, risk models, survival distributions, life tables. Life insurance models, life annuities, premium calculation, valuation theory for pension plans. Prerequisite: Math 340 and either Stat 380 or 480a.

Textbook: Actuarial Mathematics, 2nd Edition, by Bowers, N., Gerber, H., Hickman, J., Jones, D., and Nesbitt, C.

Course Outline and Topics

Chapter 3 – Survival Distributions and Life Tables

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| 3.1 Introduction | 3.5 Other Life Table Characteristics |
| 3.2 Probability for the Age-at-Death | 3.6 Assumptions for Fractional Ages |
| 3.3 Life Tables | 3.7 Some Analytical Laws of Mortality |
| 3.4 The Deterministic Survivorship Group | 3.8 Select and Ultimate Tables |

Chapter 4 – Life Insurance

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| 4.1 Introduction | 4.4 Relationships between Insurances Payable at the Moment of Death and the End of the Year of Death |
| 4.2 Insurances Payable at the Moment of Death | |
| 4.3 Insurances payable at the End of the Year of Death | |

Chapter 5 – Life Annuities

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| 5.1 Introduction | 5.3 Discrete Life Annuities |
| 5.2 Continuous Life Annuities | 5.4 Life Annuities with m -thly Payments |

Chapter 6 – Benefit Premiums

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| 6.1 Introduction | 6.3 Fully Discrete Premiums |
| 6.2 Fully Continuous Premiums | 6.4 True m -thly Premiums |

Chapter 7 – Benefit Reserves

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| 7.1 Introduction | 7.4 Fully Discrete Benefit Reserves |
| 7.2 Fully Continuous Benefit Reserves | 7.5 Benefit Reserves on a Semicontinuous Basis |
| 7.3 Other Formulas for Fully Continuous Benefit Reserves | 7.6 Benefit Reserves Based on True m -thly Benefit Premiums |

Chapter 8 – Analysis of Benefit Reserves

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| 8.1 Introduction | 8.3 Recursion relations for Fully Discrete |
| 8.2 Benefit Reserves for General Insurances | 8.4 Benefit Reserves at Fractional Durations |

Any instructor should cover all of the material specified, additional sections are optional.