

METU INSTITUTE OF APPLIED MATHEMATICS

Course Title:	ACTUARIAL RISK THEORY																																								
Course Code:	IAM 546																																								
Credit:	3(3-0)																																								
Instructor's Name:	Ömer L. GEBİZLİOĞLU																																								
Prerequisites:	Life Insurance Mathematics / Consent of the Instructor																																								
Content:	Utility and preferences, individual and collective risk models, deductibles, retention limits, ruin theory, premium principles, reinsurance policies, credibility theory, GLM and IBNR techniques, stochastic ordering of risks, insurance risk management strategies																																								
Aims:	Establishing knowledge and skills in actuarial risk analysis, developing insurance risk management capacities																																								
Learning Outcomes:	Knowledge and analytical skills in actuarial risk modelling and insurance risk management																																								
Suggested Textbooks:	<p>[Kaas et al.] Kaas, R., Goovaerts, M., Dhaene, J., Denuit, M. (2001) MODERN ACTUARIAL RISK THEORY, Kluwer Academic Publishers</p> <p>[JPC] Chavas, J-P. (2004) RISK ANALYSIS IN THEORY AND PRACTICE, Elsevier Academic Press</p> <p>Melnikov, A. (2004) RISK ANALYSIS IN FINANCE AND INSURANCE, Chapman and Hall</p> <p>Dickson, D.C.M.,(2005) INSURANCE RISK AND RUIN, Cambridge University Press</p> <p>Schmidt, K.D. (1996) LECTURES ON RISK THEORY, B.G. Teubner, Stutgard</p> <p>Note: Additional reading material will be announced during the course of lectures</p>																																								
Outline:	<table border="1"> <thead> <tr> <th>Subject</th> <th>Basic Reading</th> <th>Time Schedule</th> </tr> </thead> <tbody> <tr> <td>.Utility Theory</td> <td>Kaas et al. - Ch. 1</td> <td>Week 1-2</td> </tr> <tr> <td>.Mean-Variance Analysis</td> <td>JPC – Ch.2,3,4,6</td> <td>Week 3</td> </tr> <tr> <td>.Portfolio Selection and Dynamic Decisions</td> <td>JPC – Ch. 9,10</td> <td>Week 4</td> </tr> <tr> <td>.Policy Design for Contracts</td> <td>JPC – Ch. 11,12</td> <td>Week 5</td> </tr> <tr> <td>.Individual Risk Models</td> <td>Kaas et al. – Ch.2</td> <td>Week 6</td> </tr> <tr> <td>.Collective Risk Models</td> <td>Kaas et al. – Ch.3</td> <td>Week 7</td> </tr> <tr> <td>.Ruin Theory</td> <td>Kaas et al. – Ch.4</td> <td>Week 8-9</td> </tr> <tr> <td>.Premium Calculations</td> <td>Kaas et al. – Ch.5</td> <td>Week 10</td> </tr> <tr> <td>.Bous-Malus Systems</td> <td>Kaas et al. - Ch.11</td> <td>Week 11</td> </tr> <tr> <td>.Basic Credibility Theory</td> <td>Kaas et al. – Ch.12</td> <td>Week 12</td> </tr> <tr> <td>.GLM and IBNR Methods</td> <td>Kaas et al. – Ch.8,9</td> <td>Week 13</td> </tr> <tr> <td>.Ordering of Risks</td> <td>Kaas et al. – Ch.10</td> <td>Week 14</td> </tr> </tbody> </table>	Subject	Basic Reading	Time Schedule	.Utility Theory	Kaas et al. - Ch. 1	Week 1-2	.Mean-Variance Analysis	JPC – Ch.2,3,4,6	Week 3	.Portfolio Selection and Dynamic Decisions	JPC – Ch. 9,10	Week 4	.Policy Design for Contracts	JPC – Ch. 11,12	Week 5	.Individual Risk Models	Kaas et al. – Ch.2	Week 6	.Collective Risk Models	Kaas et al. – Ch.3	Week 7	.Ruin Theory	Kaas et al. – Ch.4	Week 8-9	.Premium Calculations	Kaas et al. – Ch.5	Week 10	.Bous-Malus Systems	Kaas et al. - Ch.11	Week 11	.Basic Credibility Theory	Kaas et al. – Ch.12	Week 12	.GLM and IBNR Methods	Kaas et al. – Ch.8,9	Week 13	.Ordering of Risks	Kaas et al. – Ch.10	Week 14	
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Resources:	Suggested textbooks, assigned book readings, suggested journal papers, exercises and homeworks.																																								