

Óbuda University John von Neumann Faculty of Informatics				Institute of Software Engineering			
Name and code: Stochastic processes and their applications (NMXSF1PMNE)						Credits: 7	
Computer Science BSc						Daytime 2020/21 year I. semester	
Subject lecturers: László Csink							
Prerequisites: (with code)							
Weekly hours:		Lecture: 2	Seminar: 2	Lab. hours: 0	Consultation: 0		
Way of assessment:		Examination					
Course description							
Goal: To lay the foundations of mathematical finance.							
Course description: Discrete and continuous Markov chains, martingale theory, stochastic finance, applications.							

Lecture schedule													
Education week	Topic												
1	Moment generating functions.												
2	Computing probability and expectation by conditioning.												
3	Markov Chains: Introduction.												
4	Markov Chains: Classification of States.												
5	Branching Processes.												
6	Markov Chains: Limiting Probabilities.												
7	Markov Chains: Reversibility.												
8	Poisson Processes.												
9	Renewal Processes.												
10	Continuous Time Markov Chains.												
11	Martingales.												
12	Stochastic Finance I.												
13	Stochastic Finance II.												
14	Summary												
Midterm requirements													
Midterm Test Scheduling													
Education week	Topic												
Midterm grade calculation methods													
Method of replacement													
cf. TVSZ													
Type of exam													
Written exam													
Exam grade calculation methods													
Final grade calculation methods													
<table> <tr> <th>Achieved result</th><th>Grade</th></tr> <tr> <td>89-100%</td><td>excellent (5)</td></tr> <tr> <td>76-88%</td><td>good (4)</td></tr> <tr> <td>63-75%</td><td>average (3)</td></tr> <tr> <td>51-62%</td><td>weak (2)</td></tr> <tr> <td>0-50%</td><td>failed (1)</td></tr> </table>		Achieved result	Grade	89-100%	excellent (5)	76-88%	good (4)	63-75%	average (3)	51-62%	weak (2)	0-50%	failed (1)
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References													
Obligatory:													
Janko Gravner: Lecture Notes for Introductory Probability.													
https://www.math.ucdavis.edu/~gravner/MAT135A/resources/lecturenotes.pdf													
Rick Durrett: Essentials of Stochastic Processes. Springer, 2010.													
Recommended:													
Others:													

