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 2021/22 year II. 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

Online or written exam, depending on the pandemic situation.

Exam grade calculation methods

Final grade calculation methods

Achieved result	Grade
89-100%	excellent (5)
76-88%	good (4)
63-75%	average (3)
51-62%	weak (2)
0-50%	failed (1)

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: