Introduction to Simulation

Winter

(in German: Introduction to Simulation)

Module-ID: FIN-INF-120345

Abbreviation	Credit Points	Semester	Term	Duration	Language	Level
ItS	6	Winter	starting at 1.	1 Semester	english	Master

Link:	LSF
Limited accessability:	
Responsibility:	Graham Horton
Lecturer:	Graham Horton
Classes:	• Lecture *Introduction to Simulation* • Exercise class *Introduction to Simulation*
Applicability in curriculum:	- M.Sc. DKE: Fundamentals of Data Science - M.Sc. DE: Grundlagen Informatik - M.Sc. DE: Informatik Grundlagen (SPO 2027)

Intended learning outcomes:
Students who complete the course ...

- can analyse discrete, continuous and hybrid systems using a professional simulation tool
- know how to obtain an accurate result efficiently when integrating initial value problems numerically
- can carry out input and output analysis to obtain statistically significant results for stochastic, discrete-event models
- can select an appropriate modelling paradigm for a given situation
- can perform a simulation study and interpret its results

Content:
Introduction to the fundamentals and steps in a simulation study:

- discrete-event simulation
- random variables and random number generation
- statistical data analysis
- ordinary differential equations and numerical integration
- stochastic Petri nets
- the AnyLogic simulation system
- discrete-time Markov chains
- agent-based simulation

Workload:
56 contact hours + 124 h self study

Pre-examination requirements:	Type of examination:	Teaching method / lecture hours per week (SWS):
	2h written exam	• 2 SWS lecture • 2 SWS exercise class

Prerequisites according to examination regulations:	Recommended prerequisites:
keine	Basic engineering mathematics

Media:	Literature:
	Banks, Carson, Nelson, Nicol: Discrete-Event System Simulation

Comments:

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