

# 4IT496 SIMULATION OF SYSTEMS

Course code	4IT496
Course title in language of instruction	Simulation of Systems
Course title in Czech	Simulace systémů (v angličtině)
Course title in English	Simulation of Systems
Mode of completion and number of credits	Exam ECTS (6 credits) One ECTS credit corresponds to 26 hours of workload for an average student.
Type of course	Daily attendance: 2/2 (hours of lectures per week / hours of seminars per week)
Language of instruction	English
Level of course and year of study	master: 2
Semester	WS 2011/2012 – FIS
Name of lecturer	prof. Ing. Václav Řepa, CSc. (supervisor) Ing. Oleg Svatoš (instructor, lecturer) Ing. Tomáš Šalamon, MBA (instructor, lecturer)
Prerequisites	not Simulation of Systems

## Aims of the course

The objective of the course is to provide overall view of social systems modeling methods and issues regarding their application using information technology. Students can deepen their knowledge of particular topics of their interest in specialized courses at University of Economics, Prague. Additional objective of the course is to provide knowledge in the field of multi-agent systems and serious gaming as methods of social systems simulation.

## Learning outcomes and competences

Upon successful completion of this course, students

- become familiar with the field of computer simulation in social science,
- will be able to distinguish various approaches to simulation and choose the proper one for the particular task,
- will be able to practically analyze the problems that can be solved by using simulation models,
- will be able to build discreet simulations, system dynamics models, agent-based simulations and other kinds of simulation models.

## Course contents

Lectures:

Introduction to social sciences – Economics, Sociology, Political science, Psychology and their areas of interest  
Game Theory  
Overview of econometric methods  
Systems dynamics  
Multi-agent systems  
Serious gaming  
Gathering data about human behavior through MMORPG  
Economy of MMORPG from neoclassical perspective  
MMORPG from institutional perspective

Tutorials:

The purpose of tutorials is to practice concepts introduced in lectures. MS Excel, Simprocess, PowerSim, JADE and other tools will be used.

## Teaching methods and student workload

Type of teaching method	Hours of workload
	daily attendance
Participation in lectures	26
Preparation for lectures	26
Attendance at seminars/workshops/tutorials	26
Preparation for seminars/workshops/tutorials	26
Preparation of term paper	26
Preparation for final test	26
<b>Total</b>	<b>156</b>

## Assessment methods

Requirement type	Weight
	daily attendance
Term paper	30 %
Mid-term test(s)	20 %
Final test	20 %
practical simulation	30 %
<b>Total</b>	<b>100 %</b>
<b>Special requirements and details: none</b>	

## Recommended reading

Type*	Author	Title	Published in	Publisher	Year	ISBN
R	WOOLDRIDGE, M. J.	An introduction to multiagent systems	Chichester	John Wiley & Sons	2002	0-471-49691-X
R	WOOLDRIDGE, M. J.	An introduction to multiagent systems	Hoboken	John Wiley and Sons	2009	978-0-470-51946-2
A	STERMAN, J. D.	Business dynamics : systems thinking and modeling for a complex world	Boston	Irwin/McGraw-Hill	2000	0-07-231135-5
A	COLMAN, A. M.	Game theory and experimental games : the study of strategic interaction	Oxford	Pergamon	1982	0-08-026069-1
A	SVATOŠ, O.	Simulation of Systems (prac.název). Praha, 2012 (v přípravě)				
A	ŠALAMON, T.	Agentology (prac.název). Praha: Bruckner Publishing, 2011 (v tisku)				

\* R – required reading, A – additional reading