

Study programme(s): Teaching Informatics (IC)			
Level: master			
Course title: Mathematical modelling and simulation (Code: IA 132)			
Lecturer: Arpad Takači			
Status: elective			
ECTS: 7 points			
Requirements: none			
Learning objectives Study of basic notions modelling and simulation, analysis of dynamical systems, and learning one simulation language with animation.			
Learning outcomes <i>Expected:</i> Student should learn the standard methods of methods for modelling dynamical systems and computer simulation, as well as the basics and principles of a simulation language with animation. <i>Optimal:</i> Besides the minimal, the students should prove the ability to construct the mathematical model of some real system, and conduct the corresponding simulation modelling by using a simulation language.			
Syllabus <i>Theoretical instruction</i> Models and modelling, computer simulation. Learning the notions system, model and simulation, their classification and properties, phases and reasons for modelling and simulation. Modelling with ordinary and partial differential equations. <i>Practical instruction</i> Learning a simulation language, (e.g. AnyLogic), construction of simulation models, simulation and analysis of results.			
Literature 1. A. Takači, Notes on <i>Mathematical Modelling</i> , Department of Mathematics and Informatics, Faculty of Sciences, University of Novi Sad, Novi Sad 2006. 2. N. D. Fowkes, J. J. Mahony, <i>An Introduction to Mathematical Modelling</i> , John Willey and Sons, New York 1996. 3. S. M. Ross, <i>Simulation</i> , Third Edition, Academic Press, New York 2002. 4. S. Lynch, <i>Dynamical Systems with Applications using MATLAB</i> , Birkhauser Verlag, Boston 2004.			
Weekly teaching load			Other:
Lectures: 2	Exercises: 2	Other forms of teaching:	
Teaching methodology Teaching is conducted on computers, together with the teacher. The students are obliged to do a seminar paper.			
Grading method (maximum number of points 100)			
Pre-exam obligations	points	Final exam	points
Active participation in lectures	5	Oral exam	40
Practical instruction	5		
Colloquia	25,25		

