

<b>Study Program :</b> MSc in Ecology			
<b>Degree level:</b> Master Degree			
<b>Course Title:</b> Mathematical modelling and simulation in ecology			
<b>Lecturer:</b> Dr. Arpad Takači			
<b>Status of the course:</b> elective			
<b>Number of ECTS:</b> 9			
<b>Prerequisites:</b> -			
<b>Objective of the course:</b> Study of basic notions modeling and simulation, analysis of dynamical systems, and learning one simulation language with animation.			
<b>Outcome of the course:</b>			
<i>Minimal:</i> Student should learn the standard methods of methods for modeling dynamical systems and computer simulation, and learn the basics and principles of a simulation language with animation..			
<i>Desirable:</i> Besides the minimal, the student should prove that he/she is capable to construct the mathematical model of some real system, and conduct the corresponding simulation modeling by using a simulation language			
<b>Curriculum:</b>			
<i>Theory:</i> Models and modeling, computer simulation, Learning the notions system, model and simulation, their classification and properties, phases and reasons for modeling and simulation. Modeling with ordinary and partial differential equations.			
<i>Practice:</i> Learning a simulation language, (e.g., AnyLogic), construction of simulation models, simulation and analysis of results.			
<b>References</b>			
1. A. Takači, Notes on <i>Mathematical Modeling</i> , Department of Mathematics and Informatics, Faculty of Science, 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.			
<b>Total hours:</b>			
Lectures: 2	Practicals: 2	Student research work: 5	
<b>Teaching methods::</b>			
The teaching is conducted on computers, parallel with the teacher. The students are obligatory to do a seminar paper.			
<b>Assessment</b>			
<b>Requirements</b>	<b>points</b>	<b>Final exam</b>	<b>points</b>
Active participation in lectures	5	Practical exam	10
Active participation in practicals	5	Oral exam	20
Test(s)	20		
Seminar	40		