

<b>Study programmes:</b> PhD studies - Informatics				
<b>Course name:</b> R467 - Swarm intelligence algorithms				
<b>Lecturers:</b> Milan Tuba and other teachers from Department for Computer Science and Informatics				
<b>Status:</b> Optional				
<b>ECTS:</b> 9				
<b>Attendance prerequisites:</b> There are no prerequisites				
<b>Course aims:</b> Making student capable to develop and to use different scientific and professional techniques based on the swarm intelligence in order to solve NP-hard optimization problems.				
<b>Course outcome:</b> Upon finishing this course, student has thorough knowledge about swarm intelligence optimization which enables him/her to make high-quality judgments about considered problems and to solve these problems efficiently.				
<b>Course content:</b> - Discrete (combinatorial) and continuous (global) optimization. NP-hard problems. <ul style="list-style-type: none"> <li>- Constrained and unconstrained optimization.</li> <li>- Solution search, Monte-Carlo approach.</li> <li>- Nature-inspired algorithms, biologically-inspired algorithms, swarm intelligence algorithms, intensification and diversification.</li> <li>- Well-known benchmark problems and quality assessment of results.</li> <li>- Hybridization and memetic algorithms.</li> <li>- Applications of swarm intelligence algorithms.</li> <li>- Verification techniques.</li> </ul>				
<b>Literature:</b> <ol style="list-style-type: none"> <li>1. Xin-She Yang: Nature-Inspired Optimization Algorithms. Elsevier, 2014.</li> <li>2. El-Ghazali Talbi: Metaheuristics: From design to implementation. Wiley, 2009.</li> </ol> <p>(teacher can some select other adequate books)</p>				
<b>Number of hours:</b> 10	<b>Lectures:</b> 4	<b>Tutorials:</b> -	<b>Laboratory:</b> -	<b>Research:</b> 6
<b>Teaching and learning methods:</b> Frontal, group, individual and practical.				
<b>Assessment (maximal 100 points)</b>				
<b>Course assignments</b>	<b>points</b>	<b>Final exam</b>		<b>points</b>
Lectures	-	Written exam		-
Exercises / Tutorials	-	Oral exam		-
Colloquia	-	Written-oral exam		40
Essay / Project	60			