

1.	Course Title	Agent-based systems
2.	Code	F18L3S073
3.	Study program	Software engineering and information systems
4.	Study Program Organizer	Faculty of Computer Science and Engineering
5.	Degree (first, second, third cycle)	first cycle
6.	Academic year / semester 3 / summer / optional	7. ECTS credits 6
8.	Teacher	associate professor SoNja Gievska, assistant professor Kire Trivodaliev
9.	Course enrollment prerequisites	Вештачка интелигенција
10.	<p>Course program goals (competencies):  Agent based modeling offers a natural metaphor for explaining phenomena in the natural and social sciences, ranging from evolution to epidemic spread to racial segregation and forming coalitions.. Many systems can be modeled as being composed of self-interested or altruistic agents interacting with their environment and one another: cooperating, negotiating, competing or forming coalitions. Very simple rules governing agent (micro) behavior can lead to complex and emergent phenomena (macro-level).The aim of this course is to introduce students to the agent paradigm suitable for modeling systems in different domains (e.g., games, robots, social behavior). After completion of the course the student will be able to design and implement single- and multi-agent systems using suitable tools and platforms.</p>	
11.	<p>Course program content:  Selected topics: agent architecture; knowledge representation, reasoning, adaptation and learning in agents; programming languages and platforms for modeling, designing and implementing agents; simulations and predictive analysis in agent systems; reasoning with uncertain knowledge; introduction to game theory as a mathematical model for designing agent interactions: cooperation, negotiation, concurrency and forming coalitions.</p>	
12.	<p>Learning methods:  Lectures using presentations, interactive lectures, exercises (using equipment and software packages), teamwork, case studies, invited guest lecturers, independent preparation and defense of a project assignment and seminar work.</p>	
13.	Total available time	6 ECTS x 30 hours = 180 hours
14.	Distribution of the available time	30 + 45 + 15 + 15 + 75 = 180 hours

15.	Teaching activity forms	15.1.	Lectures – theoretical teaching	30 hours
		15.2.	Exercises (laboratory, auditory), seminar papers, teamwork	45 hours
16.	Other activity forms	16.1.	Project Tasks	15 hours
		16.2.	Independent Learning Tasks	15 hours
		16.3.	Home learning	75 hours
17.	Assessment methodology			
	17.1.	Tests		10 points
	17.2.	Seminar paper/project (presentation: written and oral)		10 points
	17.3.	Activity and learning		10 points
	17.4.	Final exam		70 points
18.	Assessment criteria (points/grade)	up to 50 points		5 (five) (F)
		51 to 60 points		6 (six) (E)
		61 to 70 points		7 (seven) (D)
		71 to 80 points		8 (eight) (C)
		81 to 90 points		9 (nine) (B)
		91 to 100 points		10 (ten) (A)
19.	Course completion and final exam requirements	Realized activities 15.1 and 15.2		
20.	Teaching Language	Macedonian and English		
21.	Teaching quality evaluation method	Internal evaluation mechanisms and questionnaires		
22.	Course Material			
	22.1.	Mandatory course material		

No	Author	Title	Publisher	Year
1	Michael Wooldridge	An Introduction to Multiagent Systems (2nd Edition)	John Wiley & Sons Ltd	2009
2	Yoav Shoham & Kevin Leyton-Brown	Multiagent Systems: Algorithmic, Game-Theoretic and Logical Foundations	Cambridge University Press	2009
3	Uri Wilensky & William Rand	Introduction to Agent-based Modeling	MIT Press	2015
22.2. Additional course material				
No.	Author	Title	Publisher	Year