



## RTU Course "Artificial Intelligence in Business"

12307 Sistēmu teorijas un projektēšanas katedra

### General data

Code	DSP705
Course title	Artificial Intelligence in Business
Course status in the programme	Compulsory/Courses of Limited Choice
Course level	Post-graduate Studies
Course type	Academic
Field of study	Computer Science
Responsible instructor	Jānis Grundspenķis
Academic staff	Egons Lavendelis
Volume of the course: parts and credits points	1 part, 4.0 Credit Points, 6.0 ECTS credits
Language of instruction	LV, EN
Possibility of distance learning	Not planned
Maximum auditorium capacity	36
Maximum number of students per semester	36
Abstract	Artificial intelligence includes rather new technologies that can be used to solve complex business problems in different domains. The information technology specialist must be able to select the most suitable artificial intelligence technologies for business problems. The main topic is their usage for practical business problem solving. Different programming approaches are reviewed to show origins of the agent oriented programming and differences from other approaches. Overview of various types of agents and their applications is given in the course. Intelligent mechanisms, like planning, knowledge representation, inference and machine learning are covered, too. Already developed agent projects are analysed illustrating what types of agents are suitable for what projects. Algorithms used in artificial intelligence and their implementations as well as the agent oriented software engineering process are covered in the practical part of the course.
Goals and objectives of the course in terms of competences and skills	The goal of the course is to give understanding of the advanced artificial intelligence technologies and abilities to apply these technologies to solve various complex business problems. The main objectives of the course are the following: To acquire different programming approaches, especially the agent oriented programming. To study intelligent agents and multi-agent systems, their development and applications, as well as to be able to apply agents and multi-agent systems to solve various business problems. To study various artificial intelligence solutions and know their applicability.
Structure and tasks of independent studies	Students have to carry out independent analysis of already developed agent projects using available literature and software developed in the projects. Independent studies have two goals. Firstly, the student has an opportunity to study the latest applications of intelligent agents. Secondly, he/she learns, how to analyse the available literature during the research.
Recommended literature	Russell S., Norvig P. Artificial Intelligence: A Modern Approach. – New Jersey: Prentice – Hall, 2003, 905 p. Wooldridge M. „An introduction to Multiagent Systems”. – Chichester, England: John Wiley & Sons, 2002, 348 p. Bigus J.P., Bigus J., Bigus J. Constructing Intelligent Agents Using Java: Professional Developer's Guide, Wiley, 2nd Edition, 2001, 432. Bergenti, F., Gleizes, M.P., Zambonelli, F. (Eds.). Methodologies and Software Engineering for Agent Systems. The Agent-Oriented Software Engineering Handbook, Kluwer Academic Publishers, London p. 505, 2004. Papildus minētajai literatūrai tiks izmantoti raksti par konkrētiem aģentu pielietojumiem
Course prerequisites	None

### Course outline

Theme	Hours
Functional, object-oriented and agent-oriented software	6
Concept of intelligent agents and main characteristics of them	4
Types of agents	4
Agents intelligence (search, planning, knowledge representation and reasoning)	12
Multi-agent systems and agent interactions	10
Application domains of intelligent agents, usage of cooperative and competitive agents	8
Agent development	8
Expert systems	4
Neural networks	4
Genetic algorithms and evolution programming	4

### Learning outcomes and assessment

Learning outcomes	Assessment methods
Knows different programming approaches and possibilities to apply them.	Practical work about objects and agents. Corresponding problems in the examination.
Knows and is able to apply the latest solutions of artificial intelligence.	Laboratory work about decision trees and neural networks. Independent research about already developed agent projects. Corresponding problems in the examination.
Knows the types of intelligent agents, their characteristics, is capable to choose suitable agents and apply them to solve problems of various domains.	Independent research about already developed agent projects.
Knows agent interaction mechanisms and is capable to design the mechanisms for different applications.	Practical work about agent interaction mechanisms. Corresponding problems in the examination.
Understands intelligent mechanisms used in agents and is capable to choose the most suitable one(-s) for a specific system.	Laboratory works about intelligent mechanisms used in agents. Corresponding problems in the examination.
Has a good knowledge about agent oriented software engineering process and is capable to carry out activities corresponding to the analysis and design phases.	Practical works about analysis and design phases of the agent oriented software engineering process. Corresponding problems in the examination.

***Study subject structure***

Part	CP	ECTS	Hours per Week			Tests		
			Lectures	Practical	Lab.	Test	Exam	Work
1.	4.0	6.0	2.0	1.0	1.0		*	