



RTU Course "Development Methods of Applied Intelligent Software Systems"

12308 Programmatūras inženierijas katedra

General data

Code	DIP483
Course title	Development Methods of Applied Intelligent Software Systems
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	Novickis Leonīds
Academic staff	Rikure Tatjana Šitikovs Vjačeslavs
Volume of the course: parts and credits points	1 part, 4.0 Credit Points, 6.0 ECTS credits
Language of instruction	LV, EN, RU
Possibility of distance learning	Not planned
Abstract	The following major issues are considered within the course: basic principles and methodology of IACS development; knowledge base modelling and creating; implementation of logical deduction algorithms; development of IACS demonstration prototypes based on Artificial Intelligence models and advanced IT solutions
Goals and objectives of the course in terms of competences and skills	The main goal of the course is to strengthen competence in the field of IACS design and development. To present basic principles of knowledge base modelling and creating. To form basic skills in development of IACS prototypes based on Artificial Intelligence methods and Web solutions.
Structure and tasks of independent studies	To execute practical works in accordance with general implementation and laboratory works plans. The tasks include: development of knowledge base model in the form of decision tree; to transform decision tree into IF-THEN model; to realise three logical deduction algorithms (direct and reverse deduction, probability application), to develop IACS demonstration prototype.
Recommended literature	1. Intelektuālo sistēmu projektēšana / J.Grundspeņķis, L.Novickis, J.Osis, V.Šitikovs. - RTU, 2005.- 61 lpp. 2. Левин Р., Дранг Д., Эделсон Б. Практическое введение в технологию искусственного интеллекта и экспертных систем. М., 2004. - 240 с. 3. Mācību līdzekļu komplekts : www.cs.rtu.lv/ASTF/LDPPG/lidzekli/htm (ietver sevī: PPT prezentāciju, mācību līdzekļi, video demonstrācijas piemēru)
Course prerequisites	Essential Principles of Artificial Intelligence, Programming Languages

Course outline

Theme	Hours
1. Introduction to Intelligent Applied Computer Systems (IACS)	2
2. Introduction to Knowledge Engineering	2
3. Knowledge Description Methods	2
4. Knowledge Extraction Methods: Learning without Deductions	2
5. Knowledge Extraction Methods: Learning with Deductions	2
6. Knowledge Extraction Basic Principles in Samples	2
7. Learning Steps with Samples	2
8. Knowledge Extraction at Meta-Level	2
9. IACS Architecture	2
10. IACS Development Methodology	4
11. IACS Implementation Methods: Direct Logical Deduction	8
12. IACS Implementation Methods : Knowledge Base Processing	6
13. Knowledge Base Model : Decision Tree	6
14. IACS Implementation Methods: Reverse Logical Deduction	8
15. Decision Tree Transformation into IF-THEN Rules	6
16. IACS Implementation Methods Based on Probability Application	6
17. Conclusions	2

Learning outcomes and assessment

Learning outcomes	Assessment methods
Be able to formulate essential principles of IACS development, to discuss advantages of different knowledge models and realisation algorithms	Successfully passed examination (written form)
Be able to develop independently knowledge base models	Executed laboratory work

Be able to implement logical deduction algorithms (direct and reverse logical deduction, deduction based on probabilities)	Executed laboratory works
Be able to develop and present IACS demonstration prototype based on advanced IT solutions (Web technologies, etc.)	Developed and presented demonstration prototype

Study subject structure

Part	CP	ECTS	Hours per Week			Tests		
			Lectures	Practical	Lab.	Test	Exam	Work
1.	4.0	6.0	2.0	0.0	2.0		*	