<table>
<tr><td>NAME OF THE COURSE</td><td colspan="5">Cognitive systems</td></tr>
<tr><td>Code</td><td>PMII20</td><td>Year of study</td><td colspan="3">GU-1
GU-2</td></tr>
<tr><td>Course teacher</td><td>doc.dr. sc. Branko Žitko</td><td>Credits (ECTS)</td><td colspan="3">5,0</td></tr>
<tr><td rowspan="2">Associate teachers</td><td rowspan="2"></td><td rowspan="2">Type of instruction (number of hours)</td><td>L</td><td>S</td><td>E</td><td>F</td></tr>
<tr><td>30</td><td></td><td>30</td><td></td></tr>
<tr><td>Status of the course</td><td>elective</td><td>Percentage of application of e-learning</td><td colspan="3">50%</td></tr>
<tr><td colspan="6">COURSE DESCRIPTION</td></tr>
<tr><td>Course objectives</td><td colspan="5">Adopt the core methods of knowledge-based artificial intelligence.
Understand with tasks that deal with knowledge-based artificial intelligence.
Understand the methods that knowledge-based artificial intelligence agents use to solve these tasks.
Analyze the relationship between knowledge-based artificial intelligence and human cognition.</td></tr>
<tr><td>Course enrolment requirements and entry competences required for the course</td><td colspan="5">Requirements: Introduction to Artificial Intelligence
Competences: Data Structures and Algorithms</td></tr>
<tr><td>Learning outcomes expected at the level of the course (4 to 10 learning outcomes)</td><td colspan="5">Design and implement artificial intelligence agents based on knowledge
Apply agents and strategies for solving complex practical problems
Use models and agent’s results while reasoning about human cognition</td></tr>
<tr><td>Course content broken down in detail by weekly class schedule (syllabus)</td><td colspan="5">Week 1:
Lecture: Course introduction, teacher, obligations, exam,
Exercise: Representation of Raven’s matrices by semantic network
Week 2:
Lecture: Generate and test, Means-ends analysis
Exercise: Solving Raven’s matrices by using semantic network and generate and test method
Week 3:
Lecture: Problem reduction, production systems
Exercise: Solving Raven’s matrices by using semantic network and means-ends analysis
Week 4:
Lecture: Frames
Exercise: Representation of Raven’s matrices by frames
Week 5:
Lecture: Learning by recording cases. case-based reasoning
Exercise: Learning of solving Raven’s matrices
Week 6:
Lecture: Incremental concept learning, classification
Exercise: Learning classification schema for Raven’s matrices
Week 7:
Lecture: Logic
Exercise: Rules for explaining procedure for solving Raven’s matrices
Week 8:
Lecture: Planning, Understanding
Exercise: Understanding of solving Raven’s matrices
Week 9:
Lecture: Commonsense reasoning
Exercise: Representation of solving Raven’s matrices by using scripts</td></tr>
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<tr><td></td><td>Week 10:
Lecture: Explanation based learning, Analogical reasoning
Exercise: Finding analog problem for Raven’s matrices
Week 11:
Lecture: Version space, Constraint propagation
Exercise: Propagation of visual constraints for Raven’s matrices
Week 12:
Lecture: Configuration
Exercise: Rules reconfiguration for solving Raven’s matrices
Week 13:
Lecture: Diagnosis
Exercise: Explanation and diagnosis for Raven’s matrices
Week 14:
Lectures: Learning by correcting mistakes
Exercise: Seeking and correcting mistakes in procedure of solving Raven’s matrices
Week 15:
Lectures: Meta-reasoning, Advanced topics
Exercise: Selecting methods for solving Raven’s matrices</td></tr>
<tr><td>Format of instruction</td><td>☒ lectures
☐ seminars and workshops
☒ exercises
☐ on line in entirety
☐ partial e-learning
☐ field work
☐ independent assignments
☐ multimedia
☐ laboratory
☐ work with mentor
☐ homework assignments</td></tr>
<tr><td>Student responsibilities</td><td>lecture attendance
active learning
colloquium
written exam</td></tr>
<tr><td>Screening student work (name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)</td><td>
<table>
<tr><th>Name</th><th>Ects</th><th>Name</th><th>Ects</th><th>Name</th><th>Ects</th></tr>
<tr><td>Class attendance</td><td>2</td><td>Research</td><td></td><td>Experimental work</td><td></td></tr>
<tr><td>Oral exam</td><td></td><td>Report</td><td></td><td>Homework assignments</td><td></td></tr>
<tr><td>Seminar essay</td><td></td><td>Essay</td><td></td><td></td><td></td></tr>
<tr><td>Tests</td><td></td><td>Practical training</td><td>1</td><td></td><td></td></tr>
<tr><td>Written exam</td><td>2</td><td>Project</td><td></td><td></td><td></td></tr>
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<tr><td>Grading and evaluating student work in class and at the final exam</td><td>Student’s activity on lectures and exercises (attendance, solving problems) (40%)
Written exam (60%)</td></tr>
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<tr><td rowspan="3">Required literature (available in the library and via other media)</td><td>Title</td><td>Number of copies in the library</td><td>Availability via other media</td></tr>
<tr><td>Artificial Intelligence: Structures and Strategies for Complex Problem Solving. George Luger. Sixth Edition. Pearson Education, 2009</td><td>0</td><td></td></tr>
<tr><td>Introduction to Knowledge Systems. Mark Stefik. Morgan Kauffman 1995</td><td>0</td><td></td></tr>
<tr><td>Optional literature (at the time of submission of study programme proposal)</td><td colspan="3">Artificial Intelligence. Patrick Winston. Third Edition. MIT Press 1993</td></tr>
<tr><td>Quality assurance methods that ensure the acquisition of exit competences</td><td colspan="3">conversation with students
student evaluation using the anonymous survey
student achievement on exam
self-analysis</td></tr>
<tr><td>Other (as the proposer wishes to add)</td><td colspan="3"></td></tr>
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