

5FI430 ZNALOSTI A ONTOLOGICKÉ INŽENÝRSTVÍ

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| Course code | 5FI430 |
| Course title in language of instruction | Znalosti a ontologické inženýrství |
| Course title in Czech | Znalosti a ontologické inženýrství |
| Course title in English | Knowledge and Ontological Engineering |
| Mode of completion and number of credits | Exam ECTS (6 credits), Exam (4 credits) One ECTS credit corresponds to 26 hours of workload for an average student. |
| Type of course | Daily attendance: 2/2 (hours of lectures per week / hours of seminars per week) |
| Language of instruction | Czech |
| Level of course and year of study | master: 5; master continuing: 2 |
| Semester | Sklad NF – NF |
| Name of lecturer | Mgr. Ing. Miroslav Vacura, Ph.D. (examiner, supervisor) |
| Prerequisites | none |

Aims of the course

Purpose of the course is to introduce students to theoretical foundations and principles of ontology engineering and also to provide overview of software tools and techniques for development and using ontologies.

Learning outcomes and competences

Upon successful completion of this course, students will be able to understand essential principles of formal ontology, description logics and reasoning in description logics. They will be also able to design consistent ontology based on some standard foundational ontology and using design patterns and also to implement such ontology using software tools and formal language OWL (RDF/XML).

Course contents

Theoretical foundations of ontology engineering: ontology in philosophy, Aristotle's categories, Arbor Porphyrii, formal and descriptive ontology, logical foundations of ontology engineering, basics of description logic, description logic SHOIN(D), tableau algorithm.

Technological aspects of ontology engineering: formal languages of semantic web: Extensible Markup Language (XML), Resource Description Framework (RDF), Web Ontology Language (OWL); conceptual modeling (using UML), technological tools for development and using ontologies: editors (Protégé), API (Jena2), RDF metadatabases (Sesame), query languages based on RDF, reasoning tools.

Formalization of knowledge by means of ontology engineering: methodology of upper-level ontologies: FRBR, CIDOC-CRM, ABC-model; foundational ontologies: DOLCE, OCHRE, BFO, OpenCYC, SUMO, KR Ontology; ontology design patterns – logical and content-oriented, methodology OntoClean, principles of modeling of uncertainty.

Teaching methods and student workload

| Type of teaching method | Hours of workload |
|--|-------------------|
| | daily attendance |
| Participation in lectures | 26 |
| Preparation for lectures | 13 |
| Attendance at seminars/workshops/tutorials | 26 |
| Preparation for seminars/workshops/tutorials | 26 |
| Preparation for mid-term test(s) | 26 |
| Preparation for final test | 39 |
| Total | 156 |

Assessment methods

| Requirement type | Weight |
|---|------------------|
| | daily attendance |
| Mid-term test(s) | 40 % |
| Final test | 60 % |
| Total | 100 % |
| Special requirements and details: none | |

Recommended reading

| Type* | Author | Title | Published in | Publisher | Year | ISBN |
|-------|--|---|--------------|-----------|------|---------------|
| R | VACURA, M. | Znalosti a ontologie (v přípravě) | | | 2008 | |
| R | BAADER, F. (. | Description Logic Handbook: Theory, Implementation, and Applications | | | 2003 | 0521876257 |
| A | FENSEL, D. | Ontologies : a silver bullet for knowledge management and electronic commerce | Berlin | Springer | 2001 | 3-540-41602-1 |
| A | SCHREIBER, A. T. – ANJEWIERDEN, A. – AKKERMANS, H. | Knowledge engineering and management : the CommonKADS methodology | Cambridge | MIT Press | 1999 | 0-262-19300-0 |

* R – required reading, A – additional reading