Ontologies and the Semantic Web

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Course Objective

To provide students with a sound **grounding of scientific, methodological and technological fundamentals in the Semantic Web domain** that will be later used to build applications that can integrate, combine and infer heterogeneous and distributed information.

Content and Schedule

Monday 16th November. 9.00-14.00

Section 1: Introduction to the Semantic Web (theory: 1 hour)

- General overview of the semantic web with special emphasis on ontologies and resources annotation (documents, texts, web pages, web services, DBs, etc). Description of the types of problems this technology can be applied to.

Section 2: Computational linguistics (theory: 2 hours, hands-on: 2 hours)

- Introduction to some computational linguistics concepts useful in building ontologies (terminological aspects: concepts, terms, relations between them, definitions, etc). Types of terminological resources (lexicons, thesauri, mono-, multilingual dictionaries, controlled-language vocabularies, terminological DBs) that can be used as a starting point in ontology building.
- Introduction to multilingual issues in ontologies.

Content and Schedule

Thuesday 17th November. 9.30-13.30

Section 3: Ontologies (theory: 4 hours)

- **Theoretical aspects: definition, scope, types of ontologies, ontology repositories.**

- **Life cycles and development methodologies used in building ontologies and ontology networks through collaborative work.**

Content and Schedule

Wednesday 18th November. 9.00-14.00

Section 3: Ontologies (hands-on: 2 hours)

- **Life cycles and development methodologies used in building ontologies and ontology networks through collaborative work.**

Section 3: Ontologies (theory: 2 hours, hands-on: 1 hour)

- **Languages used in ontology implementation (RDF(S) and OWL) as well as query languages (SPARQL).**

Content and Schedule

Thursday 19th November. 9.30-13.30

Section 3: Ontologies (hands-on: 1 hour)

- **Languages used in ontology implementation (RDF(S) and OWL) as well as query languages (SPARQL).**

Section 3: Ontologies (theory: 2 hours, hands-on: 1 hour)

- **Tools used in building and storing ontologies (Sesame, Jena, Protégé, NeOn toolkit) as well as in ontology reasoning (Pellet, Racer).**

Content and Schedule

Friday 20th November. 9.30-13.30

Exam Preparation (hands-on: 1 hour)

Section 4: Applications in the Semantic Web (theory: 1 hour)

- **Applications using semantic web technologies that have been built in national and European projects in different domains (e-commerce, knowledge management, semantic portals, etc.).**

Exam: (2 hours)

- **Each group will have 7-10 minutes to present its work**
- **Presentations should summarize all the hands-on tasks carried out during the course**

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