Università degli Studi di L'Aquila - Dipartimento di Ingegneria e Scienze dell'Informazione e Matematica

Course catalogue

Page compiled on 18/11/2019

Programme of Course "Description Logics and Web Ontologies "

- Code: DT0210
- Type of course unit: Elective (Master Degree in Computer Science curriculum GSEEM), Elective (Master Degree in Computer Science curriculum General), Elective (Master Degree in Computer Science curriculum NEDAS), Elective (Master Degree in Computer Science curriculum SEAS), Elective (Master Degree in Computer Science curriculum UBIDIS)
- Level of course unit: Postgraduate Degrees
- Semester: 1

Number of ects credits: (Master Degree in Computer Science) 3 (workload 75 hours)

Teachers: Stefania Costantini (Stefania.Costantini@univaq.it)

1	**Course objectives**	The Semantic Web is a huge successful effort to enhance the current web so that computers can process the information presented on the web, interpret and connect it; this in order to allow applications, on behalf of humans users, to identify and obtain the required knowledge. In the same way as the web is a huge distributed hypertext system, Semantic Web is intended to form a huge distributed knowledge based system. Ontology languages allow to define such knowledge bases, called "Ontologies", that are used for sharing knowledge between different systems, and between human users and computers. Ontologies are nowadays the most important way of expressing data, and are employed not only for the Semantic Web, but for every kind of application, including those in Advanced Databases, Bioinformatics, Artificial Intelligence and Robotics. Objective of this Course is to make students able to understand the Semantic Web, to know and use in practice the main Semantic Web languages and to understand their semantics (which is based on Description Logics).
2	**Course content and learning outcomes (dublin descriptors)**	Topics of the module include: • Introduction to the Semantic Web and Ontologies • The RDF and RDFS Ontology Languages • The SPARQL query language • OWL as an extension to RDF(S) • Description Logics (in a nutshell) • Datalog+- (in a nutshell) On successful completion of this module, the student should : • On successful completion of this course the student should have acquire knowledge about the Semantic Web, its related technologies and their semantic foundations, and competences about how to use these technologies. The student should be able to understand, define and query web ontologies, and understand their meaning. The student should be able to understand the role of ontologies in web applications, and should be able to develop sample ontology-based applications. The student should be able to understand and apply, in the future, possible technological new development. Pre-Assessment There is no formal pre-assessment, but Course pre-requisites are clearly stated on the Module website. Fulfilment of such pre-requisites is verified by formative assessment. Additional lectures or short seminars or individual homework are provided by the teacher in case significant problems are detected. Formative Assessment The formative assessment is performed via interactive interaction beteween teacher and students during lectures. Students are aware since the beginning of the Course that they will be involved (in turns) in: • Questioning and discussion, by means of open oral questions to the class or to single students. • Exit Slips: students may be assigned written questions or exercises to be answered in 10 minutes, and a student is then selected for oral presentation of her/his solution to the class.

		• Short seminars: students may be assigned personalized homework, that they will have to illustrate to the class by means of 20 minutes' short seminars. Summative Assessment Project (with written report) followed by an oral exam. The Project is aimed at: verification of skills in understanding and solving a significant exercise, and in explaining the proposed solution. This in order to verify the ability of application of techniques learnt during the Course, of analysis of problems and synthesis of suitable solutions, and of evaluation of alternative solutions. Criteria of evaluation will be: the level of knowledge and practical ability; the property of use of the technical/mathematical language; the clarity and completeness of explanations. The oral exam will occur within one week of the written test and will typically cover the points of the Project that need clarification plus, possibly, plus additional subjects proposed by the teacher. Assessment breakdown: 100% end-of-semester summative assessment.
3	**Course prerequisites**	Prerequisites: basic competences in Mathematical Logic and basic knowledge of Programming Languages and about the Web, and its languages HTML and XML.
4	**Teaching methodsand language**	Interactive Lectures with hands-on exercises **Language**: English **Reference textbooks** • Gregoris Antoniou and Frank Van Harmelen, ***A Semantic Web Primer***. The MIT Press. 2008. *https://wtlab.um.ac.ir/images/reports/The.MIT.Press.Semantic.Web.Primer.2nd.Edition.Mar.2008.eBook-D* • Stefania Costantini, ***Lecture Notes***.
5	**Assessment methods**	Practical Projects