

Semantic Web

Course level: Master

Course code: MLDM SW

ECTS Credits: 4.00



Course instructors: Antoine Zimmermann (École des Mines de Saint-Étienne)

Education period (Dates): 1st semester

Language of instruction: English

Expected prior-knowledge: object-oriented programming, preferably in Java, SQL, basic notions of HTTP

Aim and learning outcomes:

This course presents the main technologies and standards used in the Semantic Web to publish, link, process and query data on the Web, as well as to reason automatically with Web ontologies.

Topics to be taught (may be modified) ~20h:

- Linked Data and Semantic Web principles
- RDF, syntax and semantics
- SPARQL 1.1 Query
- OWL 2
- RDFa 1.1
- Apache Jena API, OWL API, Protégé

Practical Laboratory Sessions ~20h: Using Protégé, a triple store and Apache Jena.

Teaching methods: Lectures and lab classes. This course is practice-intensive. Each technology is first observed on real cases, then applied, then combined.

Form(s) of Assessment: Written exam (50%), practical work (50%)

Literature and study materials:

Berners-Lee, T., Hendler, J., Lassila, O. The Semantic Web, in *Scientific American*, 2001.

Gandon, F., Faron-Zucker, C., Corby, O. Le web sémantique : comment lier les données et les schémas sur le web ? Dunod/Management des Systèmes d'Information, 2012.

Hitzler, P., Krötzsch, M., Rudolph, S. *Foundations of Semantic Web Technologies*. Chapman & Hall/CRC Textbooks in Computing, 2009.

Bizer, C., Heath, T. *Linked Data: Evolving the Web into a Global Data Space*, Morgan & Claypool/Synthesis Lectures on the Semantic Web: Theory and Technology, 2010.

Staab, S., Studer, R. *Handbook on Ontologies*, International Handbooks on Information Systems, 2009.

W3C RDF Working Group. RDF 1.1 Primer. RDF 1.1 Concepts. RDF 1.1 Semantics. 2013.

W3C SPARQL Working Group. SPARQL 1.0 and 1.1, SPARQL 1.1 Update, etc.

W3C OWL Working Group. OWL 2 Primer. OWL 2 Structural Specification & Functional Style Syntax. OWL 2 Profiles. OWL 2 Direct Semantics. OWL 2 RDF-based Semantics. 2009.

Additional information:

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