UNIVERSITY OF BORÅS

Swedish School of Library and Information Science

Dynamics of Knowledge Organization Course syllabus – Doctoral course
7.5 Credits

Ladok code: FBIDKO1
Version: 1
Valid from*:* Autumn 2016
Ratified by: The Committee for research education, 2016-04-28
Educational level: Research education
Research area: Library and information science (Code 50805)

Special requirements
Bachelor's Degree or the equivalent. Priority is given to doctoral students. Applicants are required to hold the qualifications stipulated in the general study plan for doctoral studies (see Decision 962-10-83, FoU 2010/9)

Learning outcomes

On completion of the course the students should be able to:

- ***With respect to knowledge and understanding***

- explain and account for the components of knowledge organisation affected by change, such as logical structures, indexing terminology, social context of knowledge, etc.
- demonstrate an improved understanding of similarities in, and applicability of, dynamics in deep structure in relation to surface morphologies

- ***With respect to skills and abilities***

- perform measurements in complex evolving knowledge environments
- develop new applications for accessing knowledge resources

- ***With respect to professional judgments***

- be able to assess independently and critically the strengths and limitations of a particular methodology related to evolving semantics
- be able to identify pertinent novel approaches to the problem of collection diagnostics

Contents

- Semantics and digital preservation: basic concepts, theories and trends
- Vectors and matrices: word and sentence meaning for advanced access to digital collections

- Vector fields: physics as a metaphor to model evolving semantics
- Detection, measurement, and interpretation of semantic drifts
- The Semantic Web and the emergence of ontologies
- Logic, ontology languages, and ontology engineering
- Ontology evolution and semantic drifts

Teaching methods

Tuition is conducted through lectures, seminars, and supervised practical exercises.

The language of instruction is English.

Grades and types of examination

The course is examined through seminars, papers, and reports.
Grades are expressed as either Pass or Fail.
(If requested the grades can be expressed in ECTS for international students.)

Course evaluation

The students' evaluations of the course will be systematically and regularly collected in oral and/or written form. The results of evaluations will be made accessible to students and form the basis of course development.

Other

This is an advanced level course which is developed in association with the EU funded research project PERICLES. Those who wish to participate in the course should be familiar with at least two out of the following related topics: knowledge organization, information retrieval, general linguistics, and geometry at a Master's level.

Literature and other teaching methods

Allemang, D., and Hendler, J. (2011). *Semantic Web for the Working Ontologist*. Second Edition. Morgan Kaufmann. [available at: http://workingontologist.org/]

Antoniou, G., and Van Harmelen, F. (2011). *A semantic web primer*. Third Edition. MIT press, [available at: https://mitpress.mit.edu/books/semantic-web-primer-0]

Berners-Lee, T., Hendler, J., and Lassila, O. (2001). *The Semantic Web*: A new form of Web content that is meaningful to computers will unleash a revolution of new possibilities. [available at: http://www.scientificamerican.com/article/the-semantic-web/]

Herman, I (2010). *Tutorial on Semantic Web* [available at: http://www.w3.org/People/Ivan/CorePresentations/RDFTutorial/]

Lyons, J. (1968). *Introduction to theoretical linguistics*. New York: Cambridge University Press.

Nöth, W. (1990). *Handbook of semiotics*. Bloomington: Indiana University Press. (2-componential theories of word meaning).

Osgood, C.E., Suci, G.J., and Tannenbaum, P.H. (1957). *The Measurement of Meaning*. Urbana: University of Illinois Press.

Salton, G. (1968). *Automatic information organization and retrieval*. New York: McGraw-Hill.

Schlieder, C. (2010). Digital heritage: Semantic challenges of long-term preservation. *Semantic Web (1)1-2*, 143-147.

Turney, P.D., and Pantel, P. (2010). From Frequency to Meaning: Vector Space Models of Semantics. *Journal of Artificial Intelligence Research (37)*, 141-188.

Ultsch, A., and Moerchen, F. (2005). ESOM-Maps: tools for clustering, visualization, and classification with Emergent SOM. *Technical Report Dept. of Mathematics and Computer Science.* University of Marburg, Germany, No. 46.

W3C home page on Semantic Web [available at: http://www.w3.org/standards/semanticweb/]

Wittek, P., Darányi, S. Kontopoulos, E., Mysiadis, T., and Kompatsiaris, I. (2015). *Monitoring Term Drift Based on Semantic Consistency in an Evolving Vector Field*. [available at: http://arxiv.org/abs/1502.01753]

Wittek, P., Darányi, S., and Liu, Y-H. (2014). A Vector Field Approach to Lexical Semantics. In: *Proceedings of 8th International Conference on Quantum Interaction*, Filzbach, Switzerland. (June 30 - July 3, 2014). [available at: http://link.springer.com/chapter/10.1007/978-3-319-15931-7_7]

Additional material will be advised during the course.