

COURSE SYLLABUS

Domänspecifik begreppsmodellering och metoddesign, Forskarnivå Domain-specific Conceptual Modeling and Method Engineering, Post-graduate level 5 credits

Course Code: IT0934F

The Course Syllabus applies from: Jan 1, 2019

Date of Approval: Dec 3, 2018

Version Number: 1

Third-cycle Subject Area: Informatics

Academic Level: Post-graduate level

1 Name, Scope and Level of the Course

The course is given by the University of Skövde and is named Domain-specific Conceptual Modeling and Method Engineering, Post-graduate level. It comprises 5 credits and is on Post-graduate level.

2 Objectives

After completed course the PhD student should be able to:

- understand the role of conceptual modeling in Informatics and the semantics of existing semantic modelling languages;
- design domain-specific conceptual modeling languages with a firm semantic foundation;
- create and use domain-specific conceptual modeling languages as so-called metamodels;
- understand the principles of abstraction used in conceptual metamodels; and
- apply method engineering to the student's own research domain.

3 Course Content

The course targets postgraduate students whose research area includes the need to create conceptual models of their domain.

Method engineering is the activity of designing domain-specific information systems development methods that only include the constructs needed for the target domain, in particular when several modeling

viewpoints need to be integrated. A viewpoint is for example the data viewpoint, which makes statements about the data concepts of the considered domain. At the end of the course, students are able to create their own modeling methods by defining their constructs and semantics.

Outline of the course: information modeling, metamodeling, logical foundation, querying models, method engineering case study, re-engineering the Yourdan method, multiple perspectives in information systems design, intra- and inter-notational constraints, argumentation models, software process models, model quality, and domain specific conceptual modeling. The course aims at students who need to develop such methods for their PhD research. The course uses method engineering tools for domain-specific modeling.

The course includes the following topics:

- The role of (conceptual) modeling in informatics
- Analysis of existing conceptual modeling for static and dynamic aspects of systems
- Ontologies, predicate logic and Datalog
- Conceptual metamodeling as a facility to describe modeling languages
- Multi-level modeling

4 Forms of Teaching

The teaching comprises seminars and workshops. Each seminar has a theme that is based on course literature

and prepared by a group of up to three students. The workshops are supporting the student in solving the assignments.

The teaching is conducted in English.

5 Examination

The course is graded Fail (U) or Pass (G).

Registration of examination results:

Name of examination	Credits	Grading
Written assignments	5 hp/credits	U/G

To obtain a final passing grade of the course, each part of the examination must have been approved.

6 Admission Requirements

The admission requirements of the course are general entry requirements for third-cycle courses and study programmes, i.e. a second-cycle qualification or satisfied requirements for courses comprising at least 240 credits of which at least 60 credits were awarded in the second cycle, or the equivalent.

To be eligible for the course a Bachelor's Degree in Informatics, or from an area related to Informatics, or the equivalent, is required.

A background and interest in formal representations such as predicate logic is necessary to understand the course subjects.

A further requirement is proof of skills in English equivalent of studies at upper secondary level in Sweden, known as English course B. This is normally demonstrated by means of an internationally recognized test, e.g. IELTS, TOEFL or the equivalent.

7 Third-cycle Subject Area

The course forms a part of the third-cycle subject area of Informatics at the University of Skövde.

8 Approval of Course and Course Syllabus

This course was approved by the Committee for the Doctoral Programme in Informatics Dec 3, 2018. This course syllabus was ratified by the Committee for the

Doctoral Programme in Informatics Dec 3, 2018. It is valid from Jan 1, 2019.

9 Overlapping with Another Course

This course cannot constitute a part of a degree also containing a course, the content of which is totally or partly equivalent to the content of this course.

10 Additional Information

Further information will be available on the university's website before the course is provided.

National and local regulations for higher education are available on the university's website.

During and after the course there will be a follow-up evaluation concerning the learning outcomes. The main objective of the follow-up is to contribute to improving the course. The research students' experience and points of view constitute one part of the scrutiny and are obtained through written group course evaluation/discussions. The research students are to be informed about the outcome of these as well as possible decisions concerning steps to be taken.

11 Course Literature and Other Educational Materials

The course literature consists of a set of chosen scientific articles and book chapters. A list of these are provided by the course director and are listed on the course homepage for each time the course is given.

These will normally include:

Jeusfeld, M.A., Jarke, M., & Mylopoulos, J. (2009): *Metamodeling for Method Engineering*. Cambridge, MA: The MIT Press.

Karagiannis, D., Mayr, H.C., & Mylopoulos, J. (eds) (2016): *Domain-specific Conceptual Modeling - Concepts, Methods, Tools*. Springer.

Gonzalez-Perez, C. & Henderson-Sellers, B. (2008): *Metamodelling for Software Engineering*. John Wiley & Sons.