



COURSE SYLLABUS

Software Product Architectures, 7.5 credits

Mjukvaruarkitektur för produkter, 7,5 högskolepoäng

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|---------------|-------------------|----------------------|---|
| Course Code: | TMVS26 | Education Cycle: | Second-cycle level |
| Confirmed by: | Dean Feb 9, 2015 | Disciplinary domain: | Technology (95%) and social sciences (5%) |
| Valid From: | Jan 1, 2016 | Subject group: | DT1 |
| Version: | 1 | Specialised in: | A1F |
| Reg number: | JTH 2015/2147-313 | Main field of study: | Product Development |

Intended Learning Outcomes (ILO)

After completing the course, the student shall

Knowledge and understanding

- display knowledge of software architecture and its relevance to product development
- demonstrate comprehension of the influences on software architecture
- demonstrate comprehension of the different methods of describing software architecture
- demonstrate awareness of the roles and responsibilities of the software architect.

Skills and abilities

- demonstrate skills of applying architectural thinking to software product design
- demonstrate skills of defining and assessing a specific software architecture

Judgement and approach

- demonstrate ability to apply architectural thinking to software product design
- demonstrate ability to determine an appropriate level of software design documentation.

Contents

The course introduces the principles that can be applied to the architectural design of a software product, looking at modularity and layering across the spectrum of application types.

The course includes the following topics:

- Software architecture – its definition, key concepts and importance
- The role of the software architect
- Architectural stakeholders, viewpoints and perspectives
- Architectural styles, categories and the use of patterns
- Software interoperability and interfacing standards
- Reference architectures, architecture description languages and architectural standards
- Modelling, prototyping and evaluating a software architecture
- Design disclosure and documenting a software architecture
- Specifying the development infrastructure
- Software architecture in context:

System-on-a-Chip
 Parallel processing and multi-threaded systems
 Model Driven Architecture and automatic code generation
 Software product lines, architecture recovery and architecture properties
 Agile development and the relevance of design
 Enterprise applications and their architectures

Type of instruction

The course will consist of lectures, seminars, exercises and practical work.

The teaching is conducted in English.

Prerequisites

Passed courses 180 credits in first cycle, at least 90 credits within the major subject Computer Engineering, Electrical Engineering (with relevant courses in Computer Engineering), and 15 credits Mathematics. In addition, completed courses Industrial Product Realization – Process-Methods-Leadership, 9 credits, Software Engineering – a Product Perspective, 9 credits, Engineering of Socio-technical Systems, 6 credits (or the equivalent). Proof of English proficiency is required. (or the equivalent).

Examination and grades

The course is graded 5,4,3 or Fail.

The final grade for the course is based upon a balanced set of assessments. The final grade will only be issued after satisfactory completion of all assessments.

Registration of examination:

| Name of the Test | Value | Grading |
|----------------------------------|-------------|---------|
| Examination | 3 credits | 5/4/3/U |
| Assignments | 1.5 credits | 5/4/3/U |
| Laboratory work and project work | 3 credits | U/G |

Other information

Exemption from entry requirement allowed according to the selection groups of the program, where the course is included.

Course literature

The literature list for the course will be provided one month before the course starts.

Main textbook:

Title: Software Systems Architecture: Working With Stakeholders Using Viewpoints and Perspectives

Author: Nick Rozanski & Eóin Woods

Publisher: Addison Wesley, 2011, 2nd Edition.

Additional literature:

Title: Lean Architecture: For Agile Software Development

Author: James Coplien & Gertrud Bjornvig,

Publisher: John Wiley & Sons, 2010.

Title: Domain-driven Design: Tackling Complexity in the Heart of Software

Author: Eric Evans,

Publisher: Addison Wesley, 2003.

Title: Patterns of Enterprise Application Architecture

Author: Martin Fowler,

Publisher: Addison Wesley, 2002.

Title: Beyond Software Architecture: Creating and Sustaining Winning Solutions

Author: Luke Hohmann,

Publisher: Addison Wesley, 2003.