GÖTEBORGS UNIVERSITET

The Board of the IT Faculty

DIT542, Advanced software architecting, 7.5 higher education credits

Second Cycle

1. Confirmation

The syllabus was confirmed by the Faculty Board of IT Faculty, 2010-03-09 to be valid from the spring semester 2010.

Field of education: Science

Responsible department: Computer Science and Engineering.

Main field: Computer Science

2. Position in the educational system

The course is a part of Computer Science Master's programme and an elective course at the University of Gothenburg.

The level for the course in relation to degree requirements is Master´s degree, code A1F.

3. Entry requirements

The requirement for the course is to have completed two years of studies within the subject Computer Science or equivalent. The course DIT540 Software Architecture is required.

4. Course content

The course focuses on principles and methods that aid the designer/developer/architect to gain increased confidence in the architectural design. This includes quantitative modeling using architecture description languages such as AADL and MARTE, and qualitative architecture evaluation methods, e.g., ATAM. Finally, the course will also address the specific challenges related to scale, dynamics, and heterogeneity as found in system of

systems, and ultra-large scale systems.

5. Outcomes

Knowledge and understanding
After completion of the course the student is expected to be able to
- understand the importance of predictive architecting early in the system life-cycle
- understand the applicability of model-based approaches
- understand the intentionality of models throughout the system life-cycle
- understand the characteristics and challenges of architecting system-of-systems and ultra-large-scale systems
- distinguish between software architecture, system architecture, and run-time architectures.

Skills and abilities
After completion of the course the student is expected to be able to
- describe inter-dependencies among quality-attributes
- assess an architecture quantitatively and qualitatively
- develop architectural models using ADLs,
- conduct incremental and multi-fidelity architecture-centric modeling, verification, and validation

Judgement and approach
After completion of the course the student is expected to be able to
- identify critical aspects of an architecture that requires, or benefits, to be modeled, verified and validated
- trade-off architectural decisions and quality attributes
- assess strengths and weaknesses of model-based approaches and methods

6. Required reading

See separate literature list.

7. Assessment

The course is examined by an individual written exam at the end of course. A written individual essay must be approved and presented at a seminar. Participate in other students' presentation. To pass the course, the projects must also be approved.

A student who has failed a test twice has the right to change examiners, if it is possible. A written application should be sent to the Department.

In cases where a course has been discontinued or major changes have been made a student should be guaranteed at least three examination occasions (including the ordinary examination occasion) during a time of at least one year from the last time the course was given.

8. Grading scale

The grading scale comprises Fail, (U), Pass (G) and Pass with Distinction (VG).

In order to be awarded the grade Pass for a full course, the exam has to be approved. In order to get Pass with Distinction as final grade, the exam has to be awarded with Pass with Distinction. In both cases the assignments and project have to be approved.

Regarding the application of ECTS scales, please see Vice-Chancellor's decision 2007-05-28, dnr G 8 1976/07.

9. Course evaluation

The course is evaluated through meetings both during and after the course between teachers and student representatives. Further, an anonymous questionnaire can be used to ensure written information. The outcome of the evaluations serves to improve the course by indication which parts could be added, improved, changed or removed.

10. Additional information

The course is given in English