Course description: Software Product Line Engineering

Course title and credit points

The course is titled "Software Product Line Engineering" and awards 7,5 credit points. One credit point (högskolepoäng) corresponds to one credit point in the European Credit Transfer System (ECTS).

Objectives

A software product line (SPL) is a set of software products that share a common, managed set of features and that together address the needs of a particular market segment or mission. They are developed from a common set of core assets in a planned way. By developing large software systems in this way companies can produce a set of products more economically since the development effort put into the shared assets need not be duplicated. SPL's can also help companies to better address product customization tasks to meet specific needs of individual customers. This makes it possible to sustain a high rate of product innovation, while keeping guaranteed levels of overall system performance and quality. The fundamental concept of a software product line is a domain specific product architecture based upon a layered set of platforms. The issues in software product line are not just technical but also include process, organizational and business considerations. The purpose of the course is to give in-depth knowledge in the area of software product lines engineering and architectures.

Content

The course covers the following elements:

- the problems with large-scale software reuse and customization,
- scoping and domain analysis,
- design of software product-line architectures,
- development of software product-line components,
- instantiation of family members, i.e. products,
- verification and validation in software product line architectures,
- evolution of software product-line assets, i.e. the product-line architecture, the components and the products, and
- SEI's framework for Software Product Line Practice.

Assessment and grading

The course is graded based on the following elements:

- Group assignments, 3hp credits, grade A-F ECTS
- Individual written exam, 4.5hp credits, grade A-F ECTS

There is a total of 100 course points available for each student in the course, with 40 points available on the group assignments and 60 points on the written exam. The total sum of points determines the final grade: below 50 points gives grade F, 50-59 points gives grade E, 60-69 points grade D, 70-79 points grade C, 80-89 points grade B, and 90-100 points grade A. However, a student must get at least 50% of the points available on each assignment/exam.

Prerequisites

Students are eligible for the course if they have taken a basic software engineering course, a software design/modeling/frameworks course.

Course literature

Main textbook: Klaus Pohl, "*Software Product Line Engineering: Foundations, Principles and Techniques*", Springer verlag, 2005, ISBN 3-540-243720.

Lecture material will also be based on: Frank van der Linden, "Software Product Lines in Action", Springer verlag, 2007, ISBN 978-3540714361

The books will be complemented with research papers/publications made available by the course responsible.