DIT348   Software Development Methodologies, 7.5 credits

Mjukvaruutvecklingsprocesser, 7,5 högskolepoäng

First Cycle

Confirmation

This course syllabus was confirmed by Department of Computer Science and Engineering on 2021-11-15 to be valid from 2022-08-29, autumn semester of 2022.

Field of education: Science 100%
Department: Department of Computer Science and Engineering

Position in the educational system

The course is compulsory within the Software Engineering and Management Bachelor's Programme. It is also a single subject course at the University of Gothenburg.

The course can be part of the following programmes: 1) Computer Science, Bachelor's Programme (N1COS) and 2) Software Engineering and Management Bachelor's Programme (N1SOF)

Main field of studies	*Specialization*
Software Engineering	G1F, First cycle, has less than 60 credits in first-cycle course/s as entry requirements

Entry requirements

To be eligible for this course, students must have successfully completed a programming project of at least 7.5 higher education credits (for example DIT092 Mini Project: Team Programming).

Applicants must prove knowledge of English: English 6/English B or the equivalent level of an internationally recognized test, for example TOEFL, IELTS.

Learning outcomes

On successful completion of the course the student will be able to:

Knowledge and understanding
- describe what a software process is, which purpose it serves, how it can be continuously improved, and which terminology is used to discuss them
- describe and discuss the advantages and disadvantages of different lifecycles, including Waterfall, V-Model, Iterative, Incremental, and their respective combinations
- explain how a software process can be improved by the use of approaches, methods and frameworks presented in the software process improvement literature

Competence and skills
- describe the core elements of a software process and the associated method content, including activities, tasks, roles, artifacts, etc.
- discuss a software process and the way in which it can be improved by using methods and frameworks presented in the software process improvement literature and apply the correct terminology
- evaluate a development project, suggest a plan for software process improvement based on the evaluation, and apply the plan

Judgement and approach
- reflect upon current practice within the field of software process improvement, i.e. understand practical concerns and industry-related initiatives within the field of software process improvement
- identify and discuss the strengths and weaknesses of different software process improvement approaches, methods and frameworks

Course content

The course introduces the students to the role of software processes in the development of a successful software project. The course has two general themes: (1) the fundamentals of software processes; (2) the objectives and benefits of software process improvement.

The first general theme provides an introduction to the fundamentals of software processes. The course spans traditional as well as agile software development practices. Key roles, key technologies, and key activities in software development practices are covered and put into relationship with the different software development processes.

The second general theme strikes a balance between providing information about software process improvement methods currently used in practice, and insights reached by academic research in the field. Developing reliable software on time and within budget is a challenging issue for many organizations. A software process improvement

focus offers the organization a better chance for success. In this course, software process improvement methods, models and techniques will be studied with a focus on practice. The entire lifecycle of a software process improvement effort is covered, starting from the elicitation of improvement needs, through definition of an improvement plan, to evaluation of an improvement effort.

During the course, models and processes for software process improvement will be presented and discussed. Impact of using the models and processes in an organization will be explored from an organizational and managerial point of view. Special emphasis will be given to practical concerns such as changing requirements or requirement management, and related issues that challenge the software development process and the final result, i.e. the software product.

Sub-courses

1. **Take-home examination** *(Hemtentamen),* 4.5 credits
    Grading scale: Pass with distinction (5), Pass with credit (4), Pass (3) and Fail (U)

2. **Assignments** *(Inlämningsuppgifter),* 3 credits
    Grading scale: Pass (G) and Fail (U)

Form of teaching
The teaching consists of lectures, workshops, exercises and examination parts, as well as supervision in connection to the exercises.

Language of instruction: English

Assessment
The course is examined by an individual written take-home exam and assignments normally carried out in groups of 5-7 students. The assignments part is examined on the basis of solutions to compulsory problems handed in during the course and on the basis of individual contribution to the group work.

Students are required to complete written self- and peer-assessment forms during the course which will be part of the assessment of the student's individual contribution to the project.

Retake examinations of the assignments part consist of written individual assignments.

If a student, who has failed the same examined component twice, wishes to change examiner before the next examination, a written application shall be sent to the department responsible for the course and shall be granted unless there are special reasons to the contrary (Chapter 6, Section 22 of Higher Education Ordinance).

In cases where a course has been discontinued or has undergone major changes, the student shall normally be guaranteed at least three examination occasions (including the ordinary examination) during a period of at least one year from the last time the course was given.

Grades

The grading scale comprises: Pass with distinction (5), Pass with credit (4), Pass (3) and Fail (U).

In order to pass the course both the assignments and the take home examination have to be approved. The final grade in the course is decided from the grade of the take home examination.

Course evaluation

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

Additional information

Course literature to be announced the latest 8 weeks prior to the start of the course.

The course replaces the course DIT347, 7.5 credits. The course cannot be included in a degree which contains DIT347. Neither can the course be included in a degree which is based on another degree in which the course DIT347 is included.