IV2037 Business Process Design and Intelligence 7.5 credits

Business Process Design and Intelligence

This is a translation of the Swedish, legally binding, course syllabus.

If the course is discontinued, students may request to be examined during the following two academic years

Establishment

Course syllabus for IV2037 valid from Spring 2009

Grading scale

A, B, C, D, E, FX, F

Education cycle

Second cycle

Main field of study

Specific prerequisites

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

This is an advanced course on workflow and business process management systems. After taking the course the students should be able to:

- explain and apply the central terminology within the area (e.g., case, process, task, activity, role, resource, work list, etc) as well as describe the architecture of a workflow management system (according to the reference model by the Workflow Management Coalition) and account for the basic functionality of contemporary workflow- and business process management systems.
- produce a formal process model from an informal textual domain description
- represent a process in different modelling notations, as well as translate a process model from one notation to another and reason about the similarities and differences of the solutions
- implement a process model in a workflow management system, deploy and run it
- analyse process models, i.e. apply different verification techniques to check the soundness of a model as well as carry our performance analyses
- suggest redesign of existing processes and motivate it with best practises principles.
- read, analyse and present material from the scientific literature in the area

Course contents

Business process management systems (BPMS) are information systems aimed to support the business processes in an organisation. Business processes describe the organisation of work into work tasks, the distribution of work task into different resources and the provision of necessary information for the performance of the individual tasks. With other words these systems aim to support the administration of work in organisations. Characteristic is that BPMS are configured on the basis of process models which are usually graphical.

The course contains the following three elements: Modelling, Analysis and Redesign, as well as Implementation.

Modelling

Modelling refers to the activity of analysing a domain (description) from a certain point of view and structuring the outcome in a model, in this case a process model. Given an informal textual description students should be able to produce process models in a formal notation, i.e. high level Petri nets. The focus will initially be on the control-flow perspective, but gradually even the data and resource perspectives will be introduced. To support the modelling, an extensive number of design patters will be introduced.

Analysis and Redesign

Two common types of analysis in business process management context are a-priori and a-posteriori analyses. A-priori analyses refer to the analyses made on a process model before the enactment of a process management system. They are based on simulation techniques. A-posteriori analyses are realised through process mining and business intelligence technique which are performed on the actual business processes (often facilitated through the enactment of a business process management system). Both types of analyses may lead

to process redesign. This course will focus on a-priory analyses. Best practises for process redesign will be presented. Some techniques fro a-posteriori analyses will also be introduced.

Implementation

Implementation refers to the activity of defining the process models resulting from the modelling phase in a workflow management system. The course will introduce the main functionality and architecture of such systems. The students will be trained in implementing their process models in such systems.

Disposition

Lectures and group work/seminars.

Course literature

W.van der Aalst and K. van Hee, **Workflow Management: Models, Methods, and Systems**, The MIT Press, 2002, ISBN 0-262-72046-9

Compendium

Examination

- INL1 - Project Assignment, 2.5 credits, grading scale: P, F
- TEN1 - Examination, 5.0 credits, grading scale: A, B, C, D, E, FX, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

The assignment is intended to train students in process modelling and design, as well as model analyses and implementation of business processes in workflow management systems. The assignment is performed in **groups** and shall be handed in and reported latest at the date for the written exam. The assignment is marked with:

- Passed (P),
- Rest (Fx) or
- Failed (F).

If the mark Fx is given, the students are offered the possibility to resubmit, and report a corrected version of the assignment latest at the date for the written re-exam. **Assignments not submitted on time are automatically marked with F**.

The written exam is an individual, closed book exam, which means that no books, notes and other help material are allowed. It is marked with the scale: A, B, C, D, E, Fx, F. The length of the exam is **4 hours**. There will be two kinds of questions on the exam: questions that test

the skills of the students (e.g. the ability to model workflows, the ability to analyse workflows, the ability to redesign workflows) as well as questions that tests the theoretical knowledge of the students (e.g. architecture of WFMS, functionality of WFMS, workflow patterns, redesign principles, etc.).

The exam will be marked according to the following

- A - obtained at least 90% of the points of the exam
- B - obtained at least 80% of the points of the exam
- C - obtained at least 70% of the points of the exam
- D - obtained at least 60% of the points of the exam
- E - obtained at least 50% of the points of the exam
- Fx - obtained at least 40% of the points of the exam

Students who fail or, of some reason, miss the exam will be given a second chance through a re-exam. The re-exam will be of the same standard as the original exam. Students who fail or miss the re-exam are referred to the examination of the course next-following year.

Other requirements for final grade

To pass the course, a student needs to pass both the written exam and the assignment. Final grade is based on the grade of the written exam.

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.