Advanced Project Course: Secure Distributed and Embedded Systems

Programme course

6 credits

Avancerad projektkurs: Säkra distribuerade och inbyggda system

TDDE21

Valid from: 2019 Spring semester

Determined by
Board of Studies for Computer Science and Media Technology

Date determined
2018-08-31

Main field of study

Information Technology, Computer Science and Engineering, Computer Science

Course level

Second cycle

Advancement level

A1X

Course offered for

- Master's Programme in Computer Science
- Computer Science and Engineering, M Sc in Engineering
- Information Technology, M Sc in Engineering
- Computer Science and Software Engineering, M Sc in Engineering

Entry requirements

Note: Admission requirements for non-programme students usually also include admission requirements for the programme and threshold requirements for progression within the programme, or corresponding.

Prerequisites

The course expects the student to have applied project management models in previous courses or other context. The student should also have acquired knowledge equivalent to basic courses in one the profiles "Secure systems" or "Computer systems", or in one of the specializations "Embedded systems" or "Networks, distributed systems and security" in the area covered by the project.

Intended learning outcomes

The project should have significant technical level that requires in-depth subject knowledge in at least one of the subjects networks, distributed systems, security or embedded systems. The project should be carried out in a professional manner, and should develop and consolidate the participants' skills in the area of specialization.

- Analyze and structure problems in the area of specialization.
- Apply knowledge and methods from a wide range of previous courses in the area of specialization.
- Independently acquire new knowledge, as required by the project.
- Integrate knowledge from many disciplines and apply them in the context of the area of specialization.
- Formulate a requirement specification for the project based on a project directive and thereby assess the feasibility of the project in terms of technical solutions and available resources.
- Present the project results for the client as well as for other students, which can not be presumed to be specialists in the techniques used.
- Actively contribute to a well functioning project group.
- Demonstrate the ability to lead the project work with the support of a project model, and with limited access to supervisory resources.
- Plan, implement and monitor a project in the area of specialization.

The result of the project work should:

- Attain high technical quality and be based on modern knowledge and practices in the relevant field of technology.
- Be documented in relevant project documents and relevant technical documentation.
- Be presented orally.
- Meet the requirements stated in the specification.

Course content

Description of the projects, with project directives, are available on the course website. The projects will be closely linked to either ongoing research within the field of computer science or to companies active in this field. Examples could be develop a wide-area sensor data collection system, distributed system evaluation on Planetlab testbed or with cluster simulations, design and implementation of identity- and software-defined networks, or analysis of flight communication systems.
The nature of the projects may change from year to year.

Teaching and working methods

The project, which is formed according to directive given later, should consist of at approximately six students. Each group will be assigned a supervisor, who will support the group in its work and answer technical questions. For each project, there is a client with whom the project team negotiates a specification. Before project work begins, the project team should create appropriate project management documents for the project.

For each instance of the course, the examiner will present a set of project proposals. Assignment of projects to student groups is based both on their aptitude and their wishes. For each proposal there is a project charter forming the basis for further work. The project begins with the project team developing a requirements specification and relevant project management documentation for their project. The projects should be conducted according to an appropriate development model, selected by the team.
The course runs over the entire autumn semester.

Examination

PRA1	Project	6 credits	U, G

The project work will be assessed on the achievement of course objectives. Three modules, each assessed with pass/fail, are included in the assessment. These topics are:

- Technical level and quality of project results
- Written documentation in the form of technical report and relevant project documents
- Oral presentation

To pass the whole project work, the student is required to pass all parts and meet the objectives of the course. Special emphasis is given to participants actively contributing to the group working according to the project model's intentions. Grades are given as *Fail' or 'Pass'.

Grades

Two grade scale, older version, U, G

Department

Institutionen för datavetenskap

Director of Studies or equivalent

Patrick Lambrix

Examiner

Andrei Gurtov

Education components

Preliminary scheduled hours: 64 h
Recommended self-study hours: 96 h

Course literature

Other

Specific to the project

Common rules

Course syllabus

A syllabus has been established for each course. The syllabus specifies the aim and contents of the course, and the prior knowledge that a student must have in order to be able to benefit from the course.

Timetabling

Courses are timetabled after a decision has been made for this course concerning its assignment to a timetable module. A central timetable is not drawn up for courses with fewer than five participants. Most project courses do not have a central timetable.

Interrupting a course

The vice-chancellor's decision concerning regulations for registration, deregistration and reporting results (Dnr LiU-2015-01241) states that interruptions in study are to be recorded in Ladok. Thus, all students who do not participate in a course for which they have registered must record the interruption, such that the registration on the course can be removed. Deregistration from a course is carried out using a web-based form: www.lith.liu.se/for-studenter/kurskomplettering?l=sv.

Cancelled courses

Courses with few participants (fewer than 10) may be cancelled or organised in a manner that differs from that stated in the course syllabus. The board of studies is to deliberate and decide whether a course is to be cancelled or changed from the course syllabus.

Regulations relating to examinations and examiners

Details are given in a decision in the university's rule book: http://styrdokument.liu.se/Regelsamling/VisaBeslut/622678.

Forms of examination

Examination

Written and oral examinations are held at least three times a year: once immediately after the end of the course, once in August, and once (usually) in one of the re-examination periods. Examinations held at other times are to follow a decision of the board of studies.

Principles for examination scheduling for courses that follow the study periods:

- courses given in VT1 are examined for the first time in March, with re-

examination in June and August
- courses given in VT2 are examined for the first time in May, with re-examination in August and October
- courses given in HT1 are examined for the first time in October, with re-examination in January and August
- courses given in HT2 are examined for the first time in January, with re-examination at Easter and in August.

The examination schedule is based on the structure of timetable modules, but there may be deviations from this, mainly in the case of courses that are studied and examined for several programmes and in lower grades (i.e. 1 and 2).

- Examinations for courses that the board of studies has decided are to be held in alternate years are held only three times during the year in which the course is given.
- Examinations for courses that are cancelled or rescheduled such that they are not given in one or several years are held three times during the year that immediately follows the course, with examination scheduling that corresponds to the scheduling that was in force before the course was cancelled or rescheduled.
- If teaching is no longer given for a course, three examination occurrences are held during the immediately subsequent year, while examinations are at the same time held for any replacement course that is given, or alternatively in association with other re-examination opportunities. Furthermore, an examination is held on one further occasion during the next subsequent year, unless the board of studies determines otherwise.
- If a course is given during several periods of the year (for programmes, or on different occasions for different programmes) the board or boards of studies determine together the scheduling and frequency of re-examination occasions.

Registration for examination

In order to take an examination, a student must register in advance at the Student Portal during the registration period, which opens 30 days before the date of the examination and closes 10 days before it. Candidates are informed of the location of the examination by email, four days in advance. Students who have not registered for an examination run the risk of being refused admittance to the examination, if space is not available.

Symbols used in the examination registration system:

** denotes that the examination is being given for the penultimate time.

* denotes that the examination is being given for the last time.

Code of conduct for students during examinations

Details are given in a decision in the university's rule book: http://styrdokument.liu.se/Regelsamling/VisaBeslut/622682.

Retakes for higher grade

Students at the Institute of Technology at LiU have the right to retake written examinations and computer-based examinations in an attempt to achieve a higher grade. This is valid for all examination components with code “TEN” and "DAT". The same right may not be exercised for other examination components, unless otherwise specified in the course syllabus.

Retakes of other forms of examination

Regulations concerning retakes of other forms of examination than written examinations and computer-based examinations are given in the LiU regulations for examinations and examiners, http://styrdokument.liu.se/Regelsamling/VisaBeslut/622678.

Plagiarism

For examinations that involve the writing of reports, in cases in which it can be assumed that the student has had access to other sources (such as during project work, writing essays, etc.), the material submitted must be prepared in accordance with principles for acceptable practice when referring to sources (references or quotations for which the source is specified) when the text, images, ideas, data, etc. of other people are used. It is also to be made clear whether the author has reused his or her own text, images, ideas, data, etc. from previous examinations.

A failure to specify such sources may be regarded as attempted deception during examination.

Attempts to cheat

In the event of a suspected attempt by a student to cheat during an examination, or when study performance is to be assessed as specified in Chapter 10 of the Higher Education Ordinance, the examiner is to report this to the disciplinary board of the university. Possible consequences for the student are suspension from study and a formal warning. More information is available at https://www.student.liu.se/studenttjanster/lagar-regler-rattigheter?l=sv.

Grades

The grades that are preferably to be used are Fail (U), Pass (3), Pass not without distinction (4) and Pass with distinction (5). Courses under the auspices of the faculty board of the Faculty of Science and Engineering (Institute of Technology) are to be given special attention in this regard.

1. Grades U, 3, 4, 5 are to be awarded for courses that have written examinations.
2. Grades Fail (U) and Pass (G) may be awarded for courses with a large degree of practical components such as laboratory work, project work and group work.

Examination components

1. Grades U, 3, 4, 5 are to be awarded for written examinations (TEN).
2. Grades Fail (U) and Pass (G) are to be used for undergraduate projects and other independent work.

3. Examination components for which the grades Fail (U) and Pass (G) may be awarded are laboratory work (LAB), project work (PRA), preparatory written examination (KTR), oral examination (MUN), computer-based examination (DAT), home assignment (HEM), and assignment (UPG).
4. Students receive grades either Fail (U) or Pass (G) for other examination components in which the examination criteria are satisfied principally through active attendance such as other examination (ANN), tutorial group (BAS) or examination item (MOM).

The examination results for a student are reported at the relevant department.

Regulations (apply to LiU in its entirety)

The university is a government agency whose operations are regulated by legislation and ordinances, which include the Higher Education Act and the Higher Education Ordinance. In addition to legislation and ordinances, operations are subject to several policy documents. The Linköping University rule book collects currently valid decisions of a regulatory nature taken by the university board, the vice-chancellor and faculty/department boards.

LiU's rule book for education at first-cycle and second-cycle levels is available at http://styrdokument.liu.se/Regelsamling/Innehall/Utbildning_pa_grund-_och_avancerad_niva.