SYLLABUS

Network programming and distributed applications 7.5 credits D7001D

Nätverksprogrammering och distribuerade applikationer

Course syllabus admitted: Autumn 2024 Sp 1 - Present

DECISION DATE
2024-02-15

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Network programming and distributed applications 7.5 credits D7001D

Nätverksprogrammering och distribuerade applikationer

Second cycle, D7001D

Education level	Grade scale	Subject	Subject group (SCB)
Second cycle	G U 3 4 5	Mobila system	Computer Technology

Main field of study

Computer Science and Engineering

Entry requirements

Courses of at least 90 credits including (or equivalent) Introduction to programming (D0009E), Object oriented programming (D0037D), Data Structures and algorithms (D0041D), and Computer networking (D0025N). Good knowledge in English equivalent to English level 6.

Selection

The selection is based on 30-285 credits

Course Aim

After the course, the student:

1. has knowledge about a) the scientific foundation of network programming and distributed applications including security considerations and b) the proven experience programmers in this field of Computer Science;

2. has the capacity for carrying out individual work and teamwork/collaboration with various groups;

3. can create, analyze, and critically evaluate various technical solutions in terms of the design and implementation of communicating computer programs and to show insight in research and development by understanding limitations and possibilities;

4. can plan and use appropriate methods to undertake advanced programming tasks within predetermined parameters and show the ability to identify knowledge gaps and bridge these gaps by gaining new knowledge.

5. Show the ability to understand, interpretate and present scientific publications in the area.

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Contents

The course covers network communication and discusses basic structures and functionalities for the development of networking applications, including the JSON data formatting structure. The course covers using CLI's (command line interfaces) to provision and control cloud network communication services. The course covers using programming SDK's (software development kits) to provision and control cloud network communication services.

In addition, the course covers TCP/IP communication client to client and client to server protocols, tools, and services, such as SSH, gRPC, creating VPC's (virtual private clouds), HTTP API's, API gateways, load balancers, queuing services, notification services, configuring containers, and Serverless functions. The course covers how to reduce network latency using CDN's (content delivery networks). We also cover how to implement security, as well as public cloud services.

This course gives the students knowledge of programming applications involving network communication, implementation of client to server, service-oriented architectures, and distributed applications.

Realization

Each course occasion´s language and form is stated and appear on the course page on Luleå University of Technology's website.

Teaching is in English, on Internet for distance students and at campus for the students who signed up to take the course or program at campus.

The education consists of lectures. laboratory work, and assignments. The *laboratory work and assignments module* are assessed with a deadline for submission. Unapproved students must retake the *laboratory and assignment module* the next time the course is given.

Examination

If there is a decision on special educational support, in accordance with the Guideline Student's rights and obligations at Luleå University of Technology, an adapted or alternative form of examination can be provided.

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There are two course modules, lab/assignments and final examination.

For the *Laboratory work and or assignments* module grade, students will be assessed based on their written laboratory work and assignments. Some written evaluations might be required during specific class scheduled time and other evaluations might be done offline, at the students' convenience.

For the *Final examination* module grade, students will only be assessed based on the results of the final examination, which will be a written final examination.

Your *Final course grade* , will be your *final written examination* module grade, after you pass the *Laboratory work and assignments* module.

Unauthorized aids during exams and assessments

If a student, by using unauthorized aids, tries to mislead during an exam or when a study performance is to be assessed, disciplinary measures may be taken. The term "unauthorized aids" refers to aids that the teacher has not previously specified as permissible aids and that may assist in solving the examination task. This means that all aids not specified as permissible are prohibited. The Swedish version has interpretative precedence in the event of a conflict.

Course offered by

Department of Computer Science, Electrical and Space Engineering

Modules

Code	Description	Grade scale	Cr	Status	From period	Title
0006	Written exam	G U 3 4 5	3.5	Mandatory	A24	
0007	Laboratory work and assignments	U G#	4	Mandatory	A24	

Study guidance

Study guidance for the course is to be found in our learning platform Canvas before the course starts. Students applying for single subject courses get more information in the Welcome letter. You will find the learning platform via My LTU.

Last revised

by Robert Brännström 2024-02-15

Syllabus established

by LTU Skellefteå 2008-11-19

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