Data Communication in Information Systems 7.5 credits D0025N

Datakommunikation i informationssystem

Course syllabus admitted: Spring 2024 Sp 3 - Present

DECISION DATE
2023-06-16

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Datakommunikation i informationssystem

First cycle, D0025N

Education level	Grade scale	Subject	Subject group (SCB)
First cycle	U G VG *	Informationsteknik	Computer Technology

Main field of study

Information Systems Sciences

Entry requirements

In order to meet the general entry requirements for first cycle studies you must have successfully completed upper secondary education and documented skills in English language and The course assumes basic knowledge of Computer Science or Systems Science.Good knowledge in English, equivalent to English 6.

Selection

The selection is based on 1-165 credits.

Course Aim

Upon course completion, the students should:

- Gain a solid understanding of fundamental networking concepts and protocols
- Develop proficiency in web communication protocols such as HTTP/HTTPS
- Learn how to design and interact with RESTful APIs
- Acquire knowledge of data formats like JSON and their role in network programming
- Explore network security principles and best practices for securing APIs and connections

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Contents

This course provides students with an understanding of networking and web communication. Topics covered include TCP/IP fundamentals, IPv4 addressing, subnetting, DNS (Domain Name System), HTTP/HTTPS protocols, Restful APIs, data formats (JSON), gRPC, network security, and cloud-based networking.

Students will gain knowledge of TCP/IP, including its architecture, role, and operation in network communications. The course highlights the significance of DNS in network programming and explores the HTTP/HTTPS protocols for effective web communication and resource interaction.

Restful APIs are covered, focusing on REST architecture and teaching students how to build, interact with, and test RESTful APIs. Additionally, students will learn about data structuring using JSON and its applications in network programming.

The course introduces gRPC, a powerful network programming framework, and addresses network security considerations such as SSL/TLS features and secure connections. Cloud-based networking principles are also discussed, emphasizing service utilization, network management, and resource management within a public cloud provider context.

Throughout the course, practical exercises and hands-on activities enhance learning, enabling students to apply their knowledge in real-world scenarios. Upon completion, students will have the skills to confidently work with networking technologies, develop robust web applications, and ensure secure and efficient communication between systems.

Realization

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

During the course, students will work on individual tasks and group tasks. For group work, students will collaborate with each other using a variety of collaboration tools. Course material will cover the fundamental concepts, standards, importance, function and scope of computer networking, including cloud networking communications and related software development, and automation.

Teaching on the Internet for distance students or at campus for the students who signed up to take the course locally. There is IT support, a Learning management system (Canvas), e-mail and phone, and conference tool (Zoom).

The learning Management System Canvas is used for delivering course material, information and submissions. Knowledge is shared and created within the course through virtual meetings with teachers and other students for discussions, supervision, teamwork and seminars. For students who signed up to take the course at Luleå campus there will be meetings on campus.

The course may be given in English.

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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.

The course is examined through a final individual written examination and written assignment reports (individual and group tasks, which includes labs), and which concern the assigned course material.

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.

Remarks

Access to a PC with Windows 8.1 (or greater) and administrative rights to the computer to install software, an Internet connection with approx 0,5 Mbps. There is a need for a Microphone and web camera.

Course offered by

Department of Computer Science, Electrical and Space Engineering

Modules

Code	Description	Grade scale	Cr	Status	From period	Title
0008	Individual written examination	U G VG *	4	Mandatory	S22	
0009	Assignments (Individual and group tasks, which includes labs)	U G#	3.5	Mandatory	S22	

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.

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Last revised

by Robert Brännström 2023-06-16

Syllabus established

by institutionen för industriell ekonomi och samhällsvetenskap 2007-02-28

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