Faculty of Health, Science and Technology
Computer Science

Syllabus

Advanced Communication Networks

Course Code:	DVAD20
Course Title:	Advanced Communication Networks *Avancerade kommunikationsnät*
Credits:	5
Degree Level:	Master's level
Progressive Specialisation:	Second cycle, has only first-cycle course/s as entry requirements (A1N)

Major Field of Study:
DVA (Computer Science)

Course Approval
The syllabus was approved by the Faculty of Health, Science and Technology 2024-01-29, and is valid from the Autumn semester 2024 at Karlstad University.

Prerequisites
Computer Networking I, 7.5 ECTS credits, and upper secondary level English 6, or equivalent

Learning Outcomes
The aim of the course is for students to acquire a basic understanding of two key network technologies in modern communication networks: Software Defined Networking (SDN) and Network Functions Virtualisation (NFV).

Upon completion of the course students should be able to:
1. define the concepts of SDN and NFV,
2. give an account of the motivation and background for SDN and NFV,
3. explain how SDN and NFV relate to each other,
4. describe the logical structure of an SDN switch,
5. give examples of how the control and data planes of SDN are programmed,

6. describe how a data centre network is structured and how SDN can be used to control traffic in a data centre network,
7. implement simple SDN applications in a data centre network,
8. give an account of the components in the NFV reference architechture, and
9. explain how network services are created with NFV and SDN.

Content
The course covers the following:
- a description of the underlying reasons for the development of the network technologies SDN and NFV
- an introduction to terminology related to SDN and NFV
- a description of the control and data planes of SDN
- a detailed description of how the SDN control plane is programmed
- a brief description of how the SDN data plane is programmed
- an overview of the structure of a data centre network
- examples of how SDN can be used to control a data centre network
- an introduction to virtualisation with a focus on network virtualisation
- an overview of NFV reference architecture
- an explanation of "service chaining" and how it can be used to create network services

Reading List
See separate document.

Examination
Assessment is based on three components:
- practical laboratory sessions completed either individually or in pairs but presented individually
- a specialised theory assignment presented individually
- a written exam

If students have a decision from Karlstad University entitling them to Targeted Study Support due to a documented disability, the examiner has the right to give such students an adapted examination or to examine them in a different manner.

Grades
One of the grades 5 (Pass with Distinction), 4 (Pass with Some Distinction), 3 (Pass), or U (Fail) is awarded in the examination of the course.

Quality Assurance
Follow-up relating to learning conditions and goal-fulfilment takes place both during and upon completion of the course in order to ensure continuous improvement. Course evaluation is partly based on student views and experiences obtained in accordance with current regulations and partly on other data and documentation. Students will be informed of the result of the evaluation and of any measures to be taken.

Course Certificate
A course certificate will be provided upon request.

Additional information
The local regulations for studies at the Bachelor and Master levels at Karlstad University stipulate the obligations and rights of students and staff.

The course DVAD20 cannot be included in the same degree programme as the course DVAD52.