Faculty of Health, Science and Technology
Computer Science

Syllabus

Advanced Wireless Networks and Systems

Course Code:	DVAE20
Course Title:	Advanced Wireless Networks and Systems *Avancerade trådlösa nätverk och system*
Credits:	7.5
Degree Level:	Master's level
Progressive Specialisation:	Second cycle, has second-cycle course/s as entry requirements (A1F)

Major Field of Study:
DVA (Computer Science)

Course Approval
The syllabus was approved by the Faculty of Health, Science and Technology 2023-01-31, and is valid from the Autumn semester 2023 at Karlstad University.

Prerequisites
DVAD20 Advanced communication networks (5 ECTS credits), DVAD21 Internet architectures and protocols (5 ECTS credits), and DVAD22 Wireless systems (5 ECTS credits), plus upper secondary level English 6, or equivalent

Learning Outcomes
Upon completion of the course, students should be able to:
- explain how mobile networks and the technologies that support them are standardised, as well as the driving forces behind standardisation;
- outline key elements and functions in mobile core networks;
- explain how important basic functions in mobile networks are performed, for instance registration of mobile units, establishment of so-called PDU sessions, paging, tracking area update, and handover;
- name the key functions of the 3GPP architecture for service quality, and explain how these

functions interact to provide a certain service;
- give an account of the impact of a mobile network on the quality of an internet service available to a mobile unit;
- perform measurements in a mobile network and carry out plausible analyses of the results; and
- explain the roles of the most important functions of a radio access network.

Content
The course provides a comprehensive introduction to mobile networks. It introduces the technologies behind and standardisation of these networks from holistic, architectural, and operative perspectives. The course covers the core network and the radio access network, with a special emphasis on the core network. The most common control functions of a mobile unit are described, such as for instance UE registration, establishment of a PDU session, and mobility. In addition to providing the basic theory of mobile networks, the course also allows students to apply the theory in practice through practical measurements in a mobile test network.

Reading List
See separate document.

Examination
Assessment is based on mandatory exercises and 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.