Faculty of Health, Science and Technology
Computer Science

Syllabus

Software Architectures of Distributed Applications

Course Code:	DVAD28
Course Title:	Software Architectures of Distributed Applications *Mjukvaruarkitekturer för distribuerade applikationer*
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 2022-09-01, and is valid from the Spring semester 2023 at Karlstad University.

Prerequisites
Computer Science 60 ECTS credits, including at least 7.5 ECTS credits in Software Engineering, and upper secondary level English 6, or equivalent

Learning Outcomes
Upon completion of the course, students should be able to:
- explain and apply fundamental principles of software architecture for distributed applications,
- explain and carry out the tasks and responsibilities of a software architect in a development process,
- explain and describe the architecture of a software system in terms of main design decisions and the fundamental structure and behaviour of the system,
- design suitable software architectures for distributed applications in accordance with modern concepts, for instance microservices, and communicate the design to stakeholders,

- explain different classes of software systems from the perspective of a software architect and apply this knowledge to compare and contrast alternative software architectures,
- critically evaluate the suitability of a software system architecture in relation to desired functional and qualitative attributes, and
- apply suitable strategies to migrate old applications to new architectures.

Content
The course introduces concepts and principles in the area of software architecture, including methods and techniques used to design and describe software architectures and explain architectural concepts that underpin the structure and behaviour of modern software systems, such as service-oriented systems, cloud-based systems, and microservices. The course also includes discussion of the typical tasks and responsibilities of a software architect from the perspective of practice.

The course covers the following:
- Fundamental concepts and principles of software architecture
- Description and communication of software architectures through architectural views
- Patterns for software architecture
- Design principles for software architecture
- The creation of architecture for software systems aimed at reaching qualitative goals such as reliability, effectiveness, and security
- Modern architectures, such as SOA, web services, microservices, and cloud-based systems
- Software architecture in the processes of implementation and roll-out, especially continuous integration
- Migration strategies for old applications

Instruction is in the form of lectures, workshops, and laboratory sessions.

Reading List
See separate document.

Examination
Assessment is based on a written exam and individual written hand-in assignments.

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 DVAD28 cannot be included in the same degree programme as the courses DVAD11 and DVAD16.