Reg No: DVAD11/20172

Faculty of Health, Science and Technology
Computer Science

Syllabus

Software Systems Architecture

Course Code:	DVAD11
Course Title:	Software Systems Architecture *Software Systems Architecture*
Credits:	7.5
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 2017-02-17, and is valid from the Autumn semester 2017 at Karlstad University.

Prerequisites
Upper Secondary level English 6 or B, or equivalent. Computer Science 60 ECTS cr, including at least 7.5 ECTS cr in Software Engineering.

Learning Outcomes
Upon completion of the course, students should be able to:
- explain and apply the fundamental principles and concepts of software architecture,
- explain and apply the tasks and duties of software architects in the software development process,
- explain and describe the architecture of a software system in terms of principle design decisions and the system?s fundamental structures and behaviour,
- explain different classes of software systems from a software architectural point of view and apply this knowledge to compare/contrast different software architecture alternatives with each other,
- critically evaluate the suitability of a software architecture of a software system with regard to the desired functionality and quality attributes of the system, and
- design appropriate software system architectures and communicate the design to the system?s stakeholders.

Content
The course presents the concepts and principles of software architecture. It introduces methods and techniques to design and describe software architectures and explains the architectural concepts underpinning the structure and behavior of modern classes of software systems, such as service-oriented systems, cloud-based systems and micro-services. The course furthermore discusses typical tasks and responsibilities of software architects in practice.

Topics include:
-Fundamental software architecture concepts and principles
-Description and communication of software architectures through architectural views
-Software architecture patterns
-Software architecture design principles
-Architecting software systems for quality attributes, such as dependability, efficiency, and security
-Architectures of modern software systems, such as SOA, Webservices, Microservices, and cloud-based systems
-Software architecture and the Implementation and deployment process, particularly continuous integration

Instruction is in the form of a set of lectures/workshops together with laboratory sessions. Lectures partially follow the flipped classroom model in which previously distributed content in written format or as videos is discussed. Workshops introduce technical frameworks and the tools required for the labs. Labs are split into two parts: 1) a sample system used throughout the course is continuously extended in group work to provide hands-on experience of software architecture, and 2) individual assignment on more conceptual and theoretical aspects.

Reading List
See separate document.

Examination
Assessment is based on a written exam, hand-in assignments, and the group presentations and reports of laboratory tasks.

Grades
One of the grades 5 (Pass with Distinction), 4 (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.