Faculty of Health, Science and Technology
Computer Science

Syllabus

Automated Software Engineering

Course Code:	DVAD14
Course Title:	Automated Software Engineering *Automatiserad mjukvaruutveckling*
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 2019-09-23, and is valid from the Spring semester 2020 at Karlstad University.

Prerequisites
Upper secondary level English 6 or B, plus 60 ECTS credits in Computer Science, including at least 15 ECTS credits in software engineering and program development methodology, or equivalent

Learning Outcomes
Upon completion of the course, students should be able to:
- explain concepts and techniques which are fundamental for the automatisation of software engineering, such as for instance optimisation techniques, heuristics and metaheuristics, or machine learning,
- explain the advantages, disadvantages, and limitations of such techniques,
- apply these concepts and techniques for automatisation in different software engineering activities, such as testing and quality assurance, maintenance, and evolution or design,
- critically evaluate the effect and consequences of automated software engineering in a defined context

and from technical and socio-technological perspectives,
- design automatisation methods for new software-related technical scenarios and activities, and
- critically evaluate the suitability of an automatisation method for a defined software engineering scenario and context.

Content
The course covers concepts and techniques for automatisation activities in software engineering and describes current automatisation methods for several typical activities in software engineering. Students discuss the advantages and technical limitations of such techniques, as well as socio-technological consequences of automated software engineering.

The course covers the following:
- basic concepts related to for instance optimisation techniques, heuristics and metaheuristics, and machine learning
- calculation properties, strengths and limitations of automatisation techniques
- automatisation in several activities, such as quality assurance and testing, maintenance, evolution and design
- evaluation of performance and efficacy for automatisation methods in software engineering
- socio-technological and human aspects of automated software engineering

The course includes a number of lectures/workshops and laboratory sessions. Lectures are partly designed as "flipped classroom" activities, which means that students discuss previously distributed text or video materials. Workshops introduce technical frameworks and tools used in laboratory sessions.

Reading List
See separate document.

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

If students have a decision from Karlstad University entitling them to special pedagogical 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.