Faculty of Health, Science and Technology

Programme Syllabus

Bachelor Programme in Computer Science

Programme Code:	TGKDV
Programme Title:	Bachelor Programme in Computer Science
	Kandidatprogram i datavetenskap
Credits:	180 ECTS credits
Approval:	The programme syllabus was approved by the Faculty Board of Health, Science and Technology on 19 March, 2020, and applies as of the autumn semester of 2020, Rev. 1 Dec. 2022.
Language of Instruction:	Swedish and English
Education Cycle:	First cycle
Degree Type:	General
Degree Level:	Bachelor of Science, main field of study Computer Science Bachelor of Science: Computer Science
Entry Requirements:	General admission requirements and Mathematics 3c/Mathematics D

Introduction

This study programme provides thorough knowledge of software design with the opportunity of either broadening skills or specialising in, for example, software development, cybersecurity, computer networking or usability (depending on chosen courses). The programme leads to a general Bachelor's Degree in Computer Science and gives students more course options than an engineering programme that includes compulsory courses with upper-secondary Physics 2 (or Physics B) as an entry requirement. Graduates are equipped to

work in the IT sector, for example as programmers, software developers, IT developers, or IT consultants.

Programme Outcomes

The Higher Education Ordinance, System of Qualifications, specifies the outcomes required for certain degrees. The outcomes for a Degree of Bachelor are as follows:

Knowledge and understanding

For a Degree of Bachelor the student shall

- demonstrate knowledge and understanding in the main field of study, including knowledge of the disciplinary foundation of the field, knowledge of applicable methodologies in the field, specialised study in some aspect of the field as well as awareness of current research issues.

Competence and skills

For a Degree of Bachelor the student shall

- demonstrate the ability to search for, gather, evaluate and critically interpret the relevant information for a formulated problem and also discuss phenomena, issues and situations critically
- demonstrate the ability to identify, formulate and solve problems autonomously and to complete tasks within predetermined time frames
- demonstrate the ability to present and discuss information, problems and solutions in speech and writing and in dialogue with different audiences, and
- demonstrate the skills required to work autonomously in the main field of study.

Judgement and approach

For a Degree of Bachelor the student shall

- demonstrate the ability to make assessments informed by relevant disciplinary, social and ethical aspects
- demonstrate insight into the role of knowledge in society and the responsibility of the individual for how it is used, and
- demonstrate the ability to identify the need for further knowledge and undertake ongoing development of his or her skills.

Independent project (degree project)

A requirement for the award of a Degree of Bachelor is completion by the student of an independent project (degree project) for at least 15 credits in the main field of study.

Local outcomes

In addition to the national outcomes in the Higher Education Ordinance, the Bachelor Programme in Computer Science has the following local degree outcomes, according to which students shall

- demonstrate knowledge on the significance of society in the application and development of Computer Science, and
- demonstrate ability to reflect on Computer Science and the role of its applications in society in relation to human rights, ethics, and privacy.

Programme Structure

The first year of the programme mainly comprises basic courses in programming and mathematics to obtain the knowledge required in the second year. The second year provides broad knowledge in Computer Science and builds on the programming and mathematical skills developed during the first year. Many courses for the first two years are taken with

students from the Study Programme in Engineering - Computer Science and Master of Science in Computer Engineering programmes.

The third year primarily comprises a mandatory degree project as well as 30 ECTS credits of optional courses for specialisation or broadening based on the student's interests. We offer specialisations in cybersecurity, computer networking, and software development that are closely connected to the University's research. Students may also take other optional courses in Computer Science or other subjects to give their degree a particular profile. There are also excellent opportunities to take courses at other universities.

A degree project concludes the study programme. It can be done in partnership one of our partners in the region such as businesses and government agencies, or as part of one of the current research projects in Computer Science at the University. The programme primarily takes the form of scheduled lectures, laboratory work, and project work.

In the course of the programme, students will have the opportunity to interact with the larger community in to network with future employers and find an interesting degree project. These opportunities are created through activities connected to SNITS, a network group that facilitates exchange between business and IT students at Karlstad University, and through guest lectures.

Internationalisation
Karlstad University wants to promote collaboration and exchange with other universities. Karlstad University has partnerships with many other universities in Sweden and abroad, and has an organisation in place to support students who want to make use of this opportunity. Students are therefore encouraged to complete part of the programme at a university abroad.

This study programme leads to a general degree, which means that students can choose to take courses that are not part of the programme during the third year, or spend the entire fifth semester at another university in Sweden or abroad.

Programme Curriculum
The first two years comprise:

- Computer Science (at least 75 ECTS credits), including Programming Techniques, Software Development Methodology, Database Techniques, and Data Structures and Algorithms;
- Mathematics (at least 15 ECTS credits), including Discrete Mathematics,
- and a course of at least 7.5 ECTS credits in the area of humans, technology, and society.

The final year includes a mandatory degree project (15 ECTS credits in Computer Science), mandatory specialisation courses in Computer Science (15 ECTS credits) and optional courses (30 ECTS credits). As a proposal for optional courses there are tracks in cybersecurity, computer networking, and software development, or broadening courses in usability. There is the possibility for combinations, depending on the specialisations selected.

Credit Transfer
Students have the right to transfer credits from previously completed university courses in Sweden or abroad, subject to approval according to the current regulations.

Additional Information
The local regulations for first and second cycle education at Karlstad University stipulate the obligations and rights of students and staff.

This programme syllabus replaces the previous version approved [21 March, 2019, reg.no. HNT 2019/172] and applies as of the autumn semester 2020.