Hochschule Niederrhein
University of Applied Sciences

Computer Science (B. Sc.)

The Bachelor's programme in Computer Science qualifies graduates as computer scientists with a broad theoretical and practical knowledge and the abilities to apply these basic principles to a broad range of software engineering and application development fields for modern IT systems.

The initial semesters of the Bachelor's programme offer modules such as the fundamentals of programming, operating systems, algorithms and data structures, plus object-oriented software development delivering the knowledge-base in the fields of computer science.

Further modules provide skills in mathematics and computer engineering, including here digital systems, computer architectures and microprocessors. Throughout the semesters the modules are supported by comprehensive exercises and laboratory work.

Building on this foundation, the modules on interactive systems, web engineering and software engineering extend the students' competencies in the fields of software engineering, while the modules on database systems, data network management and IT security advances their competencies in the field of IT infrastructure. The programme also teaches computer graphics and image processing, distributed systems and real time systems to improve the understanding of basic principles for potential areas of application. The modules on statistic and theoretical concepts of computer science complement the knowledge of theoretical basics. In the second part of the course two choices of optional modules and a seminar are offered allowing specialisation in specific subjects.

To further deepen their knowledge in these areas, students engage in a case-based project assignment and a so-called practical phase (10 weeks). The Bachelor's programme is completed with a thesis of at least 10 weeks and a viva voce.

The practical phase and a Bachelor's thesis should, preferentially, be completed with a company or a research institute outside the university, should enable students – under academic guidance – to work on problems from the field of computer science on the basics of scientific methods and technical aids learnt in the modules, to systematically apply these in practice and to continue their development. In addition, by producing the Bachelor's thesis, students demonstrate that they are capable of working independently on a given topic and of applying scientific principles. This serves to train and advance fundamental skills and abilities that will be required as they progress through their career.

General qualifications, such as economics, marketing, technical English, project management, legal foundations, presentation techniques and legal and social issues of computer science complete the training. These modules enable students to acquire competencies for working in fields requiring knowledge of extra-disciplinary issues and general soft skills.