Please note that below exchange course offer is offered to incoming exchange students and as elective courses for our Danish students.
The courses are taught in English; however, on occasion, Danish may be used for clarification purposes when addressing Danish participants.
Course offerings may be adjusted. Course availability will depend on student enrollment in the individual courses offered.

Computer Science exchange program

The Computer Science programme provides students with a broad profile in IT. Students will be in a position to develop, update and maintain IT systems on your own initiative, both in public institutions and in companies.
The programme in Computer Science combines theory with practical problem issues and provides relevant job qualifications. You will gain a thorough insight into computer methodology and concepts, business organization, economics, production management, and environmental conditions related to business.
The following elective elements give the student an opportunity to enhance their academic and professional competencies by specialising and putting themes into perspective within the wider scope of information technology.

Availability	**Spring semester 2027**

Course overview

Course title	Level	ECTS
Mobile Application Development	2nd year/Short Cycle/EQF level 5 (4th semester of the programme)	10
Advanced Databases	2nd year/Short Cycle/EQF level 5 (4th semester of the programme)	10
IT Security	2nd year/Short Cycle/EQF level 5 (4th semester of the programme)	10
Machine Learning	2nd year/Short Cycle/EQF level 5 (4th semester of the programme)	10
Sustainability in computer science - Green code and fair technology*	2nd year/Short Cycle/EQF level 5 (4th semester of the programme)	10

- Please note that this course is offered at Zealand Naestved Campus (other courses are available at Zealand Roskilde Campus nonly)

Semester / Course Prerequisites

A foreign qualification similar to 1½-2 years engineering, IT, SW or computer science studies (comprehensive knowledge of Java and SW-Design & UML and experienced C++ or Java programmer).

COURSE DESCRIPTION

COURSE: Mobile Application Development	10 ECTS
In this course you will learn how to build apps for Android. The goal is to learn how to design and implement mobile applications (apps). We will cover best-practices, used in mobile development.	
Course Content	
This course is intended to qualify student to Design and program mobile application mainly for the Android operating system. Android applications using the Kotlin programming language and the Android Studio IDE. An Android device (phone or tablet) and/or an Android emulator is used to run the applications. Cross-platform application development for Android + iOS.	
Examination form / Assessment	
There is compulsory study activity in this course. The first 10-11 weeks of the semester are general classes. For the last approx. 5 weeks, the student prepares an individual project in a self-selected topic related to the topic. The project work is used for the exam.	
Learning Outcome	
Knowledge	The student has knowledge about: • The architecture of the Android operating system. • Cross-platform development for Android, iOS etc.
Skills	The student can: • Use a modern programming environment to program mobile applications. • Design user interfaces for mobile applications. • Make mobile applications for various types of mobile devices. • Make mobile applications communicate with back-end systems using REST. • Use the programming language Kotlin for object oriented and functional programming.
Competencies	• Design and program mobile application

Course: Advanced Databases	10 ECTS
The purpose of this elective is to provide students with a theoretical and practical foundation for the design, implementation, and manipulation of relational databases and to understand how databases can be used in practice. In this elective course, students will also be introduced to other (non-relational) ways of storing data.	
Course Content	
DB Design, SQL Server, T-SQL, views/materialized views, access control, agent jobs, simple DB file structures, MongoDB.	
Examination form / Assessment	

There is compulsory study activity in this course. The first 10-11 weeks of the semester are general classes. For the last approx. 5 weeks, the student prepares an individual project on a self-selected topic related to the topic. The project work is used for the exam.

Learning Outcome	
Knowledge	The student get knowledge about • Installation/configuration of a DB • DBMS (SQL Server) • DB design (normalization vs. performance) • Logic in a DB (T-SQL) • DB security • Different ways of accessing data (tables, views, etc.) • Automation of jobs (agent) • NoSQL Database principles
Skills	After completing the course, you should have acquired the skills to: • Database design • Programming in databases • Accessing a DB from relevant tools and applications (C#) • Reflecting on when to prioritize normalization vs. performance • Reflecting on which type of DB to use (relational, NoSQL, or files, etc.) • Reflecting on whether logic should be implemented at the DB level or in the application
Competencies	After completing the course, you should have acquired the competence to: • To be able to design a database • To be able to document a database structure in a project • To be able to apply knowledge and skills to practical use in an organization

Course: IT Security	10 ECTS
The purpose of this elective area is to develop the student's competencies in making a qualified choices of It-security rules	
Course Content	
• Network security • Cryptography • Man-in-the-middle attack • Password cracking • VPN • Hacking and counter attacks • Database security • Penetration attack.	

Examination form / Assessment	
There is compulsory study activity in this course. The first 10-11 weeks of the semester are general classes. For the last approx. 5 weeks, the student prepares an individual project in a self-selected topic related to the topic. The project work is used for the exam.	
Learning Outcome	
Knowledge	Upon completion of the course, students should have acquired knowledge about theory, principles, and practice of: • Symmetric and asymmetric encryption and their advantages and limitations • Network security in general • Digital certificates and the management of these • The techniques used by hackers • Set up security for web-services, web-tokens (JWT) • IPSec protocol and its use • Secure Virtual Private Network (VPN) and the setup of a VPN • Blockchain principles and setup of e-coins • Penetration tests applied in Metasploit
Skills	Upon completion of the course, students should have acquired the skills to: • Apply various security tools • Defend hacking in integrated environment • Perform password cracking by brutal force • Wireless attacks applied by Cain&Abel
Competencies	Upon completion of the course, students should have acquired the competencies to: • Set up security rules in a company • Install IT-Security tools • Setup a corporate VPN

Course: Machine Learning	10 ECTS
This course will focus on understanding the fundamentals of ML.	
Course Content	
• Machine Learning Basic Methods, Data mining • Training models • Learning and evaluation Principles • Python implementations in Jupyter • Frameworks SciKit Learn	
Examination form / Assessment	
There is compulsory study activity in this course. The first 10-11 weeks of the semester are general classes. For the last approx. 5 weeks, the student prepares an individual project in a self-selected topic related to the topic. The project work is used for the exam.	
Learning Outcome	

Knowledge	Upon completion of the course, students should have acquired knowledge about theory, principles, and practice of: • Applications of Machine Learning • Machine Learning Principles: supervised unsupervised, model/instance based • Basic Mathematics supporting model training • Simple Training Models: linear regression, logistic regression, clustering, re-inforcement learning • Classification and regression • Artificial Neural Network and deep Learning • Course may address popular algorithms such as Decision Trees and Support Vector Machines • Machine Learning -up to date- frameworks: Anaconda, Jupyter, Spyder, (Azure&Google) • Libraries: sklearn, pandas, numpy, matplotlib, keras
Skills	Upon completion of the course, students should have acquired the skills to: • Apply various Machine Learning tools and models • Explain Machine Learning Systems • Building and implementation of Machine Learning applications
Competencies	Upon completion of the course, students should have acquired the competencies to: • Apply Machine Learning in a company • Use Machine Learning in specific apps. • Set up a corporate system

Course: Sustainability in computer science - Green code and fair technology	**10 ECTS**
Please note that this course is offered at Zealand Campus Naestved only! This elective course delves into sustainability within computer science, focusing on both the ecological and social dimensions. We explore how we can develop software and systems that are energy-efficient, resource-conscious, and at the same time contribute to a fair and inclusive future society.	
Examination form / Assessment	
There is compulsory study activity in this course. The first 10-11 weeks of the semester are general classes. For the last approx. 5 weeks, the student prepares an individual project in a self-selected topic related to the topic. The project work is used for the exam.	
Learning Outcome	
Knowledge	The student will have:

	• Knowledge of principles and themes within sustainability science. • Knowledge of software's energy consumption and carbon footprint. • Understanding of the principles and patterns for energy-efficient coding and software architecture • Knowledge of the product lifecycle: production, use, re-use, and recycling. • Understanding of ethical considerations in the development and implementation of IT system.
Skills	The student will be able to: • Apply tools and methods to measure and analyze the energy consumption of software. • Optimize database solutions and network communication for reduced energy consumption. • Assess hardware and infrastructure choices with a focus on sustainability. • Apply sustainability principles in algorithms and artificial intelligence
Competencies	The student will be able to: • Participate in the development of modern information systems, integrating sustainability as a core principle. • Make informed and responsible choices throughout the development process to minimize environmental impact. • Design and evaluate an IT solution from a sustainability perspective in a project-based context. • Contribute to creating technological solutions that are both innovative and ethically sound.