



Curriculum part 3 - 2014

Elective programme elements
IT Network and Electronics technology

Version 1.0
Revideret 30. september 2014

Table of contents

Table of contents	1
Elective programme elements	2
Elective: Cloud Computing - network study program.....	3
Elective: Automation and Scripting - network study program	4
Elective: Free topic network study program.....	5
Elective: Control Engineering - electronics study program.....	6
Elective: Signal Processing - electronics study program.....	7
Elective: Multi-axis robots - electronics study program.....	8
Elective: Fast pulse circuit - electronics study program.....	9

Elective programme elements

In the second year of study, the programme offers a number of elective elements that are composed so that together they account for 15 ECTS.

The purpose of the elective elements is to offer students the opportunity of an individual study profile through academic immersion. The electives can be planned by the individual institution offering the programme. Students may also follow electives at other institutions provided that they pay for their own transportation, overnight accommodation, etc.

To be able to continually offer current electives, the choice of electives is changed regularly. All new electives are regularly uploaded on Fronter.

The exam form and organisation.

According to curriculum part 2 sec. 7.4 (s.8 & s.9)

Elective: Cloud Computing – network study program

Extent: 5 ECTS

Placement: 3rd semester, network study program

Contents

This course will qualify the student to understand and work with cloud computing concepts in a business setting. Topics include:

- Cloud Services
 - Software as a Service
 - Platform as a service
 - Infrastructure as a service
- Cloud Security
- Cloud Infrastructure
- Identity Management

Learning goals

Knowledge

The goal is that the student has gained the knowledge necessary to

- account for different types of cloud services and provide examples of each.
- account for the internal workings of at least one major private cloud platform.

Skills

The goal is that the student has gained the skills necessary to

- plan, deploy and maintain a cloud infrastructure on a major IaaS platform.
- install, configure and maintain a private cloud infrastructure.
- deploy applications in a cloud environment

Competencies

The goal is that the student has gained competency to

- evaluate cloud services with regards to technical considerations such as security, usability, and cost.
- plan, deploy, and maintain a private cloud infrastructure with the goal of providing differentiated service levels.
- analyze and configure network security for a cloud deployment.

Evaluation criteria

The element is part of the specialization exam together with the other special study elements. The coursework is an individual written report that must be approved, to sit the specialization exam. The elective course is weighted according to the number of ECTS points.

Elective: Automation and Scripting – network study program

Extent: 5 ECTS

Placement: 3rd semester, network study program

Contents

The goal of the automation and scripting special study is to give the student knowledge, skills, and competency for increasing efficiency in the deployment and maintenance of IT systems. Students will learn about typical automation workflows and service deployment and orchestration.

Topics include:

- common automated tasks
- automation workflows
 - automation
 - orchestration
 - deployment
 - test
 - troubleshooting
- common tools for scripting and automation
- scripting
 - theory
 - practical

Learning goals

Knowledge

The goal is that the student has gained the knowledge necessary to

- describe common industry tools used for automation
- account for typical operational tasks that can be automated

Skills

The goal is that the student has gained the skills necessary to

- use multiple common tools and applications to automate business and technical processes
- design and implement complex scripts to complete repetitive tasks
- test and troubleshoot scripts and automation solutions

Competencies

The goal is that the student has gained competency to

- identify areas in a business that can be automated
- suggest and implement appropriate solutions

Evaluation criteria

The element is part of the specialization exam together with the other special study elements. The coursework is an individual written report that must be approved, to sit the specialization exam. The elective course is weighted according to the number of ECTS points.

Elective: Free topic network study program

Extent: 10 ECTS

Placement: 3rd semester, network study program

Contents

The student can select a topic to qualify him or she for internship in companies that require special skills not covered by the ordinary electives, eg. CISCO ICND1, ICND2, CCNA or eg. MICROSOFT MCSA 410,411 or 412 or any other course. This can be based on self-study.

The chosen elective topic must be approved by the department before work is started.

Learning goals

Knowledge

The goal is to give the student knowledge of the selected topic.

Skills

The goal is to qualify the student to do practical work using the skills acquired in the topics mentioned in the **contents** section above.

Competencies

The goal is that the student has competence to ie.

- Do the certification test
- choose a programming language for an assignment

Evaluation criteria

The element is part of the specialization exam together with the other special study elements.

The elective can be evaluated by means of ie:

- The certification test result
- A report covering the topic
- An oral examination based on a report.

Elective: Control Engineering - electronics study program.

Extent: 5 ECTS

Placement: 3rd semester of study electronics.

Contents

Design, installation and testing of small regulation systems.
The course work will be done, independently and in collaboration with other students.

Learning goals

Knowledge

The goal is that the student has knowledge of:

- Reasons for the use of control systems
- Which steps are important in a regulated system.
- Which problems arise in a control system.

Skills

The goal is that the student has acquired the skills to

- Build, operate and adjust the parameters of a control system

Competencies

The goal is that the student is competent to:

- Select the optimal technical solution of a given situation

Evaluation criteria

The element is part of the specialization exam together with the other special study elements. The coursework is an individual written report that must be approved, to sit the specialization exam. The elective course is weighted according to the number of ECTS points.

Elective: Signal Processing - electronics study program.

Extent: 10 ECTS

Placement: 3rd semester electronics study program

Contents

This course will make students qualify for:

- Design, installation and testing of digital and analog signal processing systems.
- The course work will be done, independently and in collaboration with other students.

Learning goals:

Knowledge.

The goal is that the student has knowledge of:

- Purpose and use of analog and digital signal processing.
- Which technologies are relevant in signal processing.
- Which tools are relevant in signal processing area.

Skills.

The goal is that the student has acquired the skills to

- Design, implement, and test simple passive or active signal processing arrays
- Design, implement, program and test simple digital signal processing systems

Competencies.

The goal is that the student is competent to

- Independently or in collaboration with others, choose the optimum signal processing solution for a given task.

Evaluation criteria

The element is part of the specialization exam together with the other special study elements. The coursework is an individual written report that must be approved, to sit the specialization exam. The elective course is weighted according to the number of ECTS points.

Elective: Multi-axis robots - electronics study program.

Extent: 5 ECTS

Placement: 3rd semester, electronics study program

Contents

This course will make students qualify for:

Design, installation and testing of multiaxis robot systems

The course work will be done, independently and in collaboration with other students.

Learning goals:

Knowledge

The goal is that the student has knowledge of:

- Which problems arise when a robot simultaneously is working with more than one axis.
- Which technologies are relevant to robot control area.
- Which tools are relevant in this context.

Skills

The goal is that the student has acquired the skills to:

- Design, implement, program and test small multi-axis robots

Competencies

The goal is that the student has competencies to:

- Discuss the advantages and disadvantages of different solution strategies for multi-axis robots.
- Select the optimal solution in a given situation

Evaluation criteria

The element is part of the specialization exam together with the other special study elements. The coursework is an individual written report that must be approved, to sit the specialization exam.

The elective course is weighted according to the number of ECTS points.

Elective: Fast pulse circuit - electronics study program.

Extent: 5 ECTS

Placement: 3rd semester, electronics study program

Contents

- RF vs. fast switching.
- Semiconductor breakdown (avalanche)
- Standing waves vs. reflections in signal paths.
- Using the appropriate measuring techniques and instruments.
- Selecting the right type of components.
- Using the right mounting techniques.
- Impedance matching

Learning goals

Knowledge

The student must have knowledge of:

- Avalanche breakdown in semiconductors.
- Importance of practical layout of components and wiring.
- Behavior of wires and electronic component at high frequencies / rise times.

Skills

The student must have skills that enable him to:

- Build a practical circuit that will do a fast pulse (faster than 1nsec)
- Verify the circuit by measuring or some other practical way.

Competencies

The goal is that the student has competence to

- Select the appropriate components, and an appropriate way of building the fast pulse circuit as well as selecting relevant measuring techniques and instruments for verification

Evaluation criteria

The element is part of the specialization exam together with the other special study elements. The coursework is an individual written report that must be approved, to sit the specialization exam. The elective course is weighted according to the number of ECTS points.