

UCN

Transitional Curriculum for the Academy Profession Degree Programme in

Automation Engineering

Version: 2018

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the Academy Profession
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Automation Engineering
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Contents

1.	INTRODUCTION.....	3
1.1.	Ministerial order	3
1.2.	Level descriptions	3
1.3.	How graduates can expect to employ their acquired competencies	3
1.4.	Study programme model.....	5
1.5.	The ECTS credit system	6
2.	Core areas of study and ECTS credits.....	8
2.1.	Design and construction of automatic units; 25 ECTS credits	8
2.2.	Integration of automatic units; 15 ECTS credits	9
2.3.	Systems design of automatic process and production lines; 10 ECTS credits	9
2.4.	Business-related elements; 15 ECTS credits	10
2.5.	Elective educational components.....	11
3.	Compulsory educational components within the core areas of the study programme	12
4.	Number of examinations for the compulsory educational components.....	19
5.	Internship; 15 ECTS credits in the second year of study.....	20
6.	Final exam project; 15 ECTS credits in the second year of study	20
7.	Examinations that are common to all approved providers of the study programme	23
8.	Exemption	23
9.	Effective date	23
10.	INSTITUTIONAL CURRICULUM	24
11.	School organisation.....	24
12.	Where to find the curriculum	24
13.	Course of the programme.....	24
14.	Distribution of components.....	26
15.	Framework and criteria for the examinations on the study programme	27
16.	Theme/projects	29
17.	Educational components that may take place abroad.....	45
18.	Learning and teaching methods	45
19.	Academic misconduct at exams	48
20.	Other regulations.....	54
21.	Effective date and transition provisions	55
22.	Legal basis for the study programme	55

1. INTRODUCTION

1.1. Ministerial order

This transitional curriculum comprises the national and the institutional sections of the curriculum for the Academy Profession Degree Programme in Automation Engineering pursuant to Ministerial Order no. 1090 of 25 November 2009 on the Academy Profession Degree Programme in Automation Engineering. (the Study Programme Order)

Link to The Ministerial Order (in Danish): <https://www.retsinformation.dk/Forms/>

1.2. Level descriptions

The descriptions of the learning outcomes are written in accordance with the level descriptors in the Danish Qualifications Framework for Lifelong Learning.

A wide-ranging and flexible education

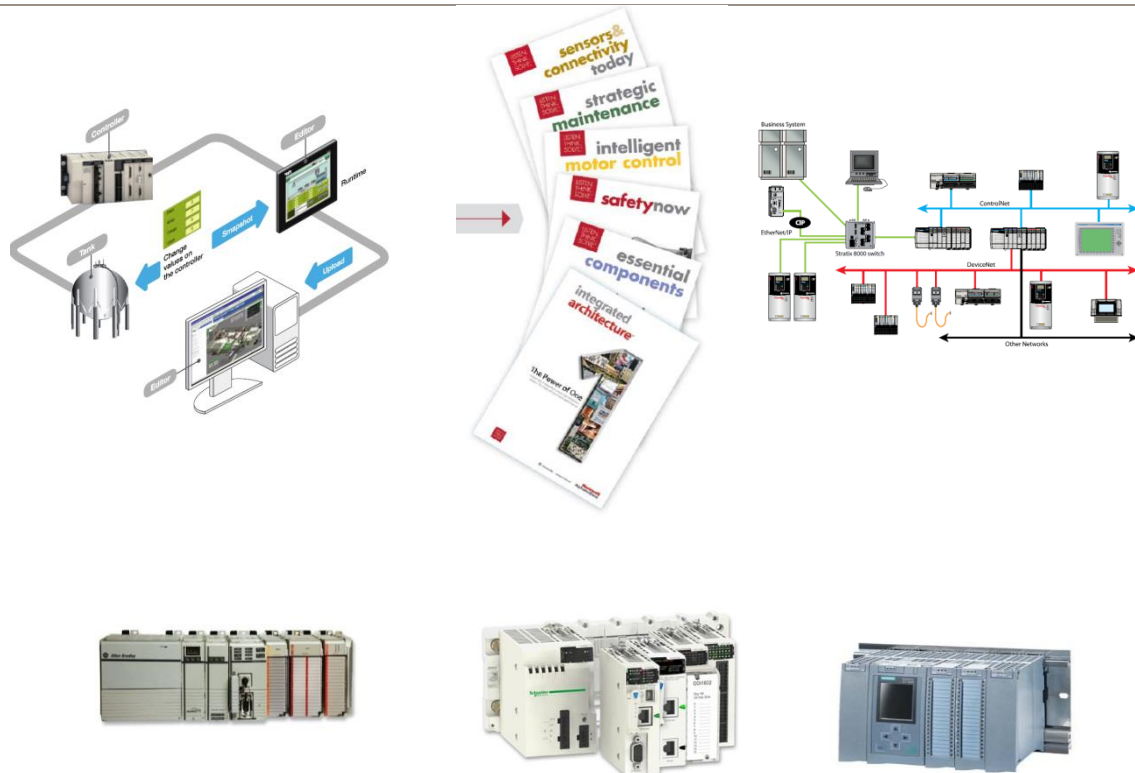
In an ever-changing and unpredictable society, there is a need for people who, in addition to good professional qualifications, have the ability to acquire new knowledge, and who can contribute to developing new products, production methods and business models. Automation is a discipline that is already very important in our everyday lives while it still holds many tasks with scope for development. This is true for the entire field of energy, the welfare sector and industrial production, to mention a few. We need intelligent facilities in intelligent buildings and that is why automation plays such an important part in the development of our society. Because of this, the Automation Engineering programme emphasises the development of the students' personal competencies in multidisciplinary collaboration, innovation and entrepreneurship. Automation engineers develop automatic systems, select optimum hardware and perform configuration as well as software development tasks.

Automation engineers are in charge of practical installation work such as installation, commissioning, optimisation and operation of automatic systems in technical production environments. Service, maintenance and daily operations can also be some of the automation engineer's job functions. Automation engineers may perform this work either as employees in a production plant or as employees of suppliers or sub-suppliers.

1.3. How graduates can expect to employ their acquired competencies

Automation engineers are involved in the development of automatic systems. Automation engineers can familiarise themselves with required documentation (idea proposals, requirements specifications and other technical documentation) and are able to prepare requirements specifications for automatic systems/facilities in consultation with the client and suppliers of parts for the system. They may perform the development work alone or teamed up with mechanical engineers and other engineers. Automation engineers develop at the system level meaning that they use specifications to select the optimum hardware solution and develop the software, ranging from PLCs over PCs to embedded SW controls.

Automation engineers draw up and use technical documentation. This could be technical documentation for an entire automation system as well as documentation and manuals for sub-components from suppliers. Based on their knowledge, automation engineers will co-ordinate the installation work with the various workmen (e.g. process technicians, electricians, smiths, electronics technicians, automatics and electronics specialists) who will be performing the practical, manual installation when commissioning and configuring/parameterising the system elements.



Furthermore, automation engineers understand practical collaboration and problem resolution in relation to suppliers of sub-systems and components. When installation difficulties occur, automation engineers apply their knowledge to analyse problems and find solutions. Problems could be conditions in the production environment or the physical environment that require adaptations or changes to enable delivery of the desired product according to contract requirements or client needs.

Automation engineers carry out such adaptations themselves by agreement with the client and/or involve construction teams or suppliers in new solutions when needed. Automation engineers prepare documentation for adaptations and upgrades when needed. This documentation can be either oral or written, and it can be of a technical nature.

They also carry out system-level diagnostics and fault-finding tasks. They collect and respond to various test data during commissioning. Depending on the nature of the problem, automation engineers can:

- solve the problem by themselves
- contact a relevant professional to fix the problem
- contact the supplier to find a solution to the problem
- contact a construction team or a manufacturing engineer.

When commissioning and optimising automation systems, automation engineers communicate their technical knowledge of the system to operators, maintenance technicians and the operations managers. Independently or in collaboration with the client or a constructor/engineer, automation engineers prepare ideas, program design and requirements specifications for further optimisation of the technical aspects of the production system.

1.4. Study programme model

The Automation Engineering programme is designed to introduce students to basic issues in machines, cells and production lines through projects/themes in the first part of the study programme. See the model below.

First year of study	Second year of study
<p>Machines</p> <p>The first semester is based on projects about automatic machines and their control panels. The objective is for students to gain fundamental knowledge about the development, design and commissioning of machines that use both digital and analogue control signals.</p> <p>Automatic systems</p> <p>The second semester is based on projects. One example could be the transport of items to/from the production unit and/or a small process plant. These projects increase students' knowledge of automatic systems and the importance of using the correct communications technology between individual systems and between systems and the systems operator.</p>	<p>Production and process plants</p> <p>The third semester is also based on projects. A project could concern e.g. a production line and/or a large process plant. These projects increase students' knowledge of data exchange and data collection with a view to documenting the quality of the manufactured products.</p> <p>The automation engineering profession</p> <p>In the fourth semester, students go on an internship and write their final exam project. The internship expands students' knowledge of the automation profession and increases their professional skills. The final exam project must document that students have achieved knowledge, skills and competencies equivalent to a significant part of the study programme's learning outcomes.</p>

The order of the profession-related elements ensures progression during the course of study and will give students fundamental knowledge, skills and competencies to work across disciplines, which is needed in automation contexts. Furthermore, the first part of the education is also about acquiring general study skills.

In the second year of study, each student selects their specialisation through their choice of elective educational components, the internship and the final exam project, in which the students will increase their skills and gain competencies in practical problem solution and application of methods.

The programme features various learning and teaching styles and working methods that include class instruction and case studies as well as periods of multidisciplinary project team work and periods of individual study. Projects must cover relevant subjects such as control technology, process control, and data acquisition etc. The foundation for each individual project will be found in current projects in the automation profession. These projects, which have increasing progression during the programme, will form the basis for the pedagogic concept of problem-based learning.

The themes, which the individual projects are to document, will require a high degree of transdisciplinarity. In their projects, students must be able to combine existing knowledge with solutions in innovative ways. The internship and final exam project take place in the second year of study. The internship expands students' knowledge of the automation profession and increases their professional skills.

The final exam project must document that the students have achieved knowledge, skills and competencies corresponding to a significant part of the study programme's learning outcomes.

1.5. The ECTS credit system

ECTS (the European Credit Transfer System) was introduced to enable the acknowledgement of study periods abroad. This means that the system applies to credit transfer in Europe.

The ECTS system is made up of several elements.
The quantitative element is described below.

The quantitative element, the ECTS credits, is the value that is allocated to the educational components you come across in your study. The purpose is to describe the workload required to complete the programme.






The credits reflect the expected workload of each educational component in relation to the total workload of one year of study.

60 ECTS credits represent the workload of one year of study. 30 credits are awarded for one semester. ECTS credits are awarded to students who complete educational components satisfactorily by passing examinations or other kinds of assessment.

In addition to being used in the European Higher Education Area, ECTS are increasingly being used in Danish study programmes and for credit transfer.

Curriculum Automation Engineering – National section

The higher education institutions offering the programme.

<p>University College of Northern Denmark, UCN Sofiendalsvej 60 DK-9200 Aalborg SV Tel.: + 45 72 69 00 00 E-mail: ucn@ucn.dk</p>	
<p>Copenhagen School of Design and Technology Landskronagade 64-70 DK-2100 København Ø Tel.: + 45 46 46 03 00 E-mail: gm@kea.dk</p>	
<p>Dania Academy of Higher Education Ellemosevej 36 DK-8960 Randers SØ Tel.: + 45 87 11 44 00</p>	
<p>Lillebaelt Academy of Professional Higher Education Munke Mose Allé 9 DK-5000 Odense C Tel.: + 45 70 10 58 00 E-mail: eal@eal.dk</p>	
<p>Business Academy Aarhus Sønderhøj 30 DK-8260 Viby J Tel.: + 45 72 28 60 00 E-mail: info@eaaa.dk</p>	

2. Core areas of study and ECTS credits

The study programme covers the following core areas of study:

1. Design and construction of automatic units (25 ECTS)
2. Integration of automatic units (15 ECTS)
3. Systems design of automatic process and production lines (10 ECTS)
4. Business-related elements (15 ECTS)

65 ECTS credits total

The study programme also includes the following educational components:

5. Elective educational components (25 ECTS)
6. Internship (15 ECTS)
7. Final exam project (15 ECTS)

55 ECTS credits total

First year of study		Second year of study	
1st semester	2nd semester	3rd semester	4th semester
Design and construction of automatic units (25)		Systems design of automatic process and production lines (10)	Internship (15)
Integration of automatic units (15)			
Business-related elements (5)	Business-related elements (5)	Business-related elements (5)	Final exam project (15)
	Elective educational components (10)	Elective educational components (15)	

2.1. Design and construction of automatic units; 25 ECTS credits

Includes control technology, mechanical and physical modelling, electrical systems design according to current regulations, project development, configuration and programming.

Knowledge

Upon completion of the course, graduates should have acquired knowledge of:

- the physical and mathematical theories that underlie technical systems in automation
- electrical installations in machines and the theories on which technical systems in the field of automation are based
- control terminology, theories and methods used in automation.

Skills

Upon completion of the course, graduates should have acquired the skills to:

- apply a varied set of technical and creative skills related to developing, designing, sizing, programming and commissioning control facilities in the field of automation
- assess practise-related problems in mechanics, electronics and control, and to propose possible solutions for those problems.

Competencies

Upon completion of the course, graduates should have acquired the competencies to:

- manage all phases of project development within the field of control and do this by structuring and performing quality assurance on solutions that are to be documented and installed according to current regulations and practises
- take a professional approach to co-operation with others in the profession and across professions
- acquire new control-related knowledge within a structured context.

2.2. Integration of automatic units; 15 ECTS credits

Covers process control, configuration and programming, operator interface, high level programming and communications technology.

Knowledge

Upon completion of the course, graduates should have acquired knowledge of:

- technology and current legislation applying to the design of operator interfaces for automatic systems
- process control terminology, theories and methods used in process automation
- configuration and programming of automatic systems.

Skills

Upon completion of the course, graduates should have acquired the skills to:

- apply various technical and creative tools for designing, sizing, programming and configuring process and automation controls
- assess practice-related problems in mechanics, electronics, control and process control and propose solutions for them
- program operator interfaces
- configure different kinds of industrial communications systems.

Competencies

Upon completion of the course, graduates should have acquired the competencies to:

- manage all phases of project development in control and do this by structuring and performing quality assurance on solutions that are later documented and installed pursuant to current regulations and practises.
- take a professional approach to co-operation with others in the profession and across professions
- acquire new control and process control-related knowledge in a structured context.

2.3. Systems design of automatic process and production lines; 10 ECTS credits

Comprises communications technology, optimisation, monitoring and operator interface, data processing and data exchange.

Knowledge

Upon completion of the course, graduates should have acquired knowledge of:

-
- terminology, theories and methods used in automation, and they should be able to reflect on technologies that can be applied in specific situations
 - network technologies and protocols that can be used to communicate at different levels in an automatic system.

Skills

Upon completion of the course, graduates should have acquired the skills to:

- apply various technical, creative and analytical skills related to designing, sizing, programming and configuring systems within the field of automation
- evaluate practical problems in mechanics, electronics, control, process control, monitoring and communication situations and propose solutions to those problems
- communicate practice-related problems and possible solutions to partners and users
- manage and evaluate data and data types.

Competencies

Upon completion of the course, graduates should have acquired the competencies to:

- manage all phases of automation project development and to do this by structuring and performing quality assurance on solutions that are to be documented and installed according to current regulations and practises
- take a professional approach to co-operation with others in the profession and across professions
- acquire new, automation-related knowledge in a structured context.

2.4. Business-related elements; 15 ECTS credits

Includes innovation, business knowledge and project management

Knowledge

Upon completion of the course, graduates should have acquired knowledge of:

- central concepts, methods and tools related to innovation and innovative projects as well as problem solution and development projects
- operating a business, business development, production control and economics as well as models for internal and external analysis
- relevant methods and contemporary tools for planning, organising and completing projects as well as project co-ordination and control
- relevant law and regulations.

Skills

Upon completion of the course, graduates should have acquired the skills to:

- undertake and control innovative working processes while applying creative methods, tools and techniques
- evaluate the market situation, prepare requirements analyses and identify client needs
- establish a rationale for decisions that includes operational, economic, environmental and security-related as well as legal aspects
- manage and direct technical tasks and projects pursuant to current legislation, regulations, quality requirements and the interest of any stakeholders.

Competencies

Upon completion of the course, graduates should have acquired the competencies to:

- partake in innovation processes and creative working processes
- undertake operations management tasks in the context of daily operations, operation optimisation and operation development
- take part in development projects and assume the role and responsibilities of project manager.

2.5. Elective educational components

The elective components are described in the institutional section of the curriculum.

3. Compulsory educational components within the core areas of the study programme

The study programme covers the following core areas of study:

1. Design and construction of automatic units (25 ECTS)
2. Integration of automatic units (15 ECTS)
3. Systems design of automatic process and production lines (10 ECTS)
4. Business-related elements (15 ECTS)

Core areas, 65 ECTS credits total

Correlation between core areas of study and compulsory educational components

No.	Core area	Compulsory educational component	ECTS
1	Design and construction of automatic units (25 ECTS)	Control technology, configuration and programming	15
		Mechanical and physical modelling	5
		Electric systems design and project development	5
2	Integration of automatic units (15 ECTS)	Process control technology	5
		Configuration and programming, operator interface, high level programming and communications technology	10
3	Systems design of automatic process and production lines (10 ECTS)	Communications technology, data processing and data exchange	5
		Optimisation, monitoring and operator interface	5
4	Business-related elements (15 ECTS)	Innovation	5
		Business knowledge	5
		Project management	5

Other compulsory educational elements

5. Elective educational components (25 ECTS)
6. Internship (15 ECTS)
7. Final exam project (15 ECTS)

Other compulsory educational elements total (55 ECTS)

All compulsory educational components and other compulsory components are finalised by examination.

3.1. Control technology, configuration and programming; 15 ECTS credits in the first year of study (Under no. 2.1 Design and construction of automatic units; 25 ECTS credits)

Includes PLC systems, PLC software, programming languages and structured programme development according to current norms and standards.

Knowledge

Upon completion of the course, graduates should have acquired knowledge of:

- the functions of PLCs as well as their construction and program execution
- interfaces, sensors and actuators
- structured program development.

Skills

Upon completion of the course, graduates should have acquired the skills to:

- apply various technical skills related to designing, sizing, programming and configuring PLC systems within the field of automation
- apply different programming languages according to current norms and standards
- select the most suitable programming language for the task at hand.

Competencies

Upon completion of the course, graduates should have acquired the competencies to:

- select units/components from a set of economic and technical requirements
- write a requirements specification and write a program for a PLC system.

3.2. Mechanical and physical modelling; 5 ECTS credits in the first year of study (Under no. 2.1 Design and construction of automatic units; 25 ECTS credits)

Includes mathematics, physics, electrical engineering and physical modelling.

Knowledge

Upon completion of the course, graduates should have acquired knowledge of:

- mathematics and physics terminology, theories, principles and methods applied in automation
- electrical engineering terminology, theories and methods applied in automation.

Skills

Upon completion of the course, graduates should have acquired the skills to:

- evaluate practical problems in mechanical and physical modelling
- use and apply design and simulation tools
- build a simple electric circuit and perform trouble shooting.

Competencies

Upon completion of the course, graduates should have acquired the competencies to:

- build models for physical modelling
- select the most appropriate components from a technical and financial point of view.

3.3. Electric systems design; 5 ECTS credits in the first year of study (Under no. 2.1 Design and construction of automatic units; 25 ECTS credits)

Includes sizing, circuit calculations, technical documentation, risk assessment and electrical safety of machinery.

Knowledge

Upon completion of the course, graduates should have acquired knowledge of:

- current standards for the sizing of machine installations
- technical documentation pursuant to current norms and standards for automatic systems
- risk assessment pursuant to current norms and standards for a given system.

Skills

Upon completion of the course, graduates should have acquired the skills to:

- design and size electric installations for small automated units
- design solutions in accordance with risk assessments conforming to applicable standards.

Competencies

Upon completion of the course, graduates should have acquired the competencies to:

- manage all stages of electric systems design, including structuring, quality assurance and preparing documentation according to current regulations and norms.

3.4. Control technology, 5 ECTS credits in the first year of study (Under no. 2.2 Integration of automatic units, 15 ECTS credits).

Includes terminology, statistics principles and dynamic process control technology.

Knowledge

Upon completion of the course, graduates should have acquired knowledge of:

- different control principles and optimisation methods
- transfer functions, including frequency analysis, in open and closed loops.

Skills

Upon completion of the course, graduates should have acquired the skills to:

- calculate and apply transfer functions
- record the characteristics of dynamic control loops
- apply appropriate methods to commission and optimise process control loops
- select appropriate process control principles.

Competencies

Upon completion of the course, graduates should have acquired the competencies to:

- optimise process plants
- assess the characteristics of components and process plants
- evaluate the selected process control principle.

3.5. Configuration and programming, operator interface and communications technology; 10 ECTS credits in the first year of study (Under no. 2.2 Integration of automatic units; 15 ECTS credits).

Includes networks and protocols, operator interface, high level programming, bus components and external I/O

Knowledge

Upon completion of the course, graduates should have acquired knowledge of:

- configuration and communication between controller and extern units
- high level programming
- configuration of controller
- relevant network technologies used in automation, including basic knowledge of data communication and protocols
- various operator interfaces, HMI and SCADA for small plant.

Skills

Upon completion of the course, graduates should have acquired the skills to:

- Specify and select components and units for data communication
- configure smaller systems for communication between units
- build smaller programs with high level programming
- write a requirements specification and use it to select, configure, commission and test a suitable network
- configure bus/network units and external/decentralised I/O
- configure and design operator interfaces.

Competencies

Upon completion of the course, graduates should have acquired the competencies to:

- compile and communicate technical documentation describing the program code of a machine
- participate in the development of machines involving high level programming
- participate in professional and interdisciplinary cooperation with professional approaches with other participants
- formulate requirements specification in relation to customer needs and success criteria
- assess and apply existing and new technologies in networks, communication and operator interfaces
- develop, program and test software used for communication between automatic units
- select and program relevant operator interfaces.

3.6. Communications technology, data processing and data exchange; 5 ECTS credits in the second year of study (Under no. 2.3 Systems design of automatic process and production lines; 10 ECTS credits)

Includes network topology, network components, protocols and databases.

Knowledge

Upon completion of the course, graduates should have acquired knowledge of:

- various network types and protocols
- network topologies
- interconnecting networks
- network and data security.

Skills

Upon completion of the course, graduates should have acquired the skills to:

- set up closed networks for machinery
- define and set up remote access to machinery
- define and create small databases.

Competencies

Upon completion of the course, graduates should have acquired the competencies to:

- develop data logging proposals
- manage data communication by applying structured and quality assured solutions that comply with current regulations and norms.

3.7. Optimisation, monitoring and operator interface; 5 ECTS credits in the second year of study (Under no. 2.3 Systems design of automatic process and production lines; 10 ECTS credits)

Includes SCADA, OPC and data acquisition.

Knowledge

Upon completion of the course, graduates should have acquired knowledge of:

- SCADA systems
- OPC client and OPC servers
- collecting and logging historical data
- network security and data validity.

Skills

Upon completion of the course, graduates should have acquired the skills to:

- set up SCADA systems for machinery and process plants
- set up OPC clients and OPC servers
- define and create small databases for data acquisition
- perform optimisation and maintenance using acquired data and knowledge of processes.

Competencies

Upon completion of the course, graduates should have acquired the competencies to:

- prepare proposals for data logging and for presenting acquired data
- analyse the effect of a particular optimisation.

3.8. Innovation; 5 ECTS credits in the first year of study (Under no. 2.4; Business-related elements; 15 ECTS credits.)

Covers handling and managing innovation, creativity and creative thinking; idea generation and development; creative working processes, methods and techniques; development processes and problem solution as well as industrial product liability.

Knowledge

Upon completion of the course, graduates should have acquired knowledge of:

- organisation development as well as change and development processes in a business
- innovation, innovation management and innovation processes as well as the theories and methods to carry out innovation projects and processes
- creativity and creative processes as well as methods, tools and techniques for generating and developing ideas
- needs- and requirements-based problem solving and market-based concept and product development
- relevant models and tools for technical problem solving and project development
- industrial legal protection and patents.

Skills

Upon completion of the course, graduates should have acquired the skills to:

- apply theories and methods for planning, initiating and completing innovation processes and projects
- manage creative processes as well as methods, tools and techniques for generating and developing ideas
- control all phases of development projects from idea to completed solution model, concept or product
- apply relevant models and tools for technical problem solution and project development
- manage the procedures for obtaining and enforcing legal protection of rights as well as manage and protect involved stakeholders' responsibilities, duties and rights in conformity with current laws and regulations.

Competences

Upon completion of the course, graduates should have acquired the competencies to:

- undertake problem solution and development tasks when developing or optimising products or production processes
- collaborate with others in development projects and innovation processes.

3.9. Business knowledge; 5 ECTS credits in the second year of study (Under no. 2.4; Business-related elements; 15 ECTS credits.)

Covers business operation and management, business development, production and economics, development of technology, quality, environment and working environment as well as relevant subjects in business and labour law.

Knowledge

Upon completion of the course, graduates should have acquired knowledge of:

- business operation and management, business development and creation of a business concept and strategy
- technology development and global trends in technology development

- methods and models for analysing the business and its context such as markets, needs, requirements, customers as well as tools for information searching and knowledge building
- cost calculation, accounts and budgets, methods and tools for economic analysis and management of a business, projects and assignments
- quality, environment and working environment as well as methods and tools for assuring quality, environmental protection and improving the work environment
- relevant topics in business and labour law related to company management and production, undertaking, completing and delivering projects as well as buying, selling and entering into contracts.

Skills

Upon completion of the course, graduates should have acquired the skills to:

- apply relevant methods and models for internal analyses of the business and the organisation and for external analyses of the business context, markets and clients
- plan, control and organise operational tasks in accordance with relevant standards and the business strategy
- apply contemporary methods and tools when calculating cost, making economic analyses, assessing, planning and controlling the business, projects and assignments
- apply quality assurance methods to project work, development work and daily tasks to assure quality and compliance with environmental and work environment regulations, current laws and industry requirements
- deal with relevant legal issues in business and labour law.

Competencies

Upon completion of the course, graduates should have acquired the competencies to:

- enter the operations and management team of a company and be in charge of development assignments
- ensure the existence of a relevant foundation for making decisions in relation to the management of operations tasks and development projects.

3.10. Project management; 5 ECTS credits in the first year of study (Under no. 2.4; Business-related elements; 15 ECTS credits)

Covers communication, management and cooperation, planning, organisation and undertaking of projects as well as coordination and task management.

Knowledge

Upon completion of the course, graduates should have acquired knowledge of:

- contemporary tools for planning, management and logistics
- project models and project control processes, work methods and tools for project work as well as group dynamics
- theories and methods about project teams and collaboration processes as well as the project manager's tasks, role and responsibilities
- the importance and role of stakeholders in relation to implementing technical projects
- the internal and external forms of communication as well as the principles of steering communication and decision-making processes.

Skills

Upon completion of the course, graduates should have acquired the skills to:

-
- build a project organisation, manage collaboration processes and establish and promote inter-disciplinary cooperation
 - use relevant tools to plan, steer, complete and document projects
 - undertake all phases of technical project management and plan, organise, steer and coordinate tasks
 - carry out stakeholder and risk analyses and apply relevant tools in communication and decision-making processes.

Competencies

Upon completion of the course, graduates should have acquired the competencies to:

- act as project manager
- manage and steer technical projects as well as day-to-day tasks.

4. Number of examinations for the compulsory educational components

The compulsory educational components are finalised by examination. See the examinations for the study programme in the "Examination schedule" section.

5. Internship; 15 ECTS credits in the second year of study

Contents of the internship

During the internship, students will work on issues that are relevant to the profession while achieving knowledge of relevant work functions. Students will be working with one or more private or public companies during the internship.

Insofar as it is possible, the internship should take place in a company within the profession that the students chose for their specialisation (e.g. industrial automation, an automation business, a processing company or advisory and support services) in order for the internship to act as the foundation for the students' final exam projects.

The internship must be performed according to the practises of the profession. It should also contribute, with the other elements of the education, to the students' development of professional competencies while they acquire knowledge of jobs in the professional community.

Knowledge

Upon completion of the course students should have acquired knowledge of:

- the tasks related to the profession as well as methods, tools and instruments.

Skills

Upon completion of the course, students should have acquired the skills to:

- independently assess and undertake relevant, practical problems included in the learning agreement made with the internship company.

Competencies

Upon completion of the course, students should have acquired the competencies to:

- take a professional approach to dealing with relevant situations and problems in the selected specialisation.

Assessment

The examination is assessed and graded according to the 7-point grading scale.

The learning outcomes for the educational component are identical to the learning outcomes for the examination.

For the examination type and exam procedure, please see the institutional section of this Curriculum.

6. Final exam project; 15 ECTS credits in the second year of study

Final exam project requirements

The final exam project is to document the students' understanding of professional practises as well as central theories and methods in the context of a practical problem based on a specific assignment/project within the field of the study programme. The problem statement, which must be central to the education and the profession, must be formulated by the student, possibly in collaboration with a private or public company or business. The educational institution must approve the problem statement.

The problem statement must cover a number of educational components.

The report, which makes up the written element of the examination, must contain:

- cover page with the project title and name of the student
- table of contents
- abstract/synopsis
- introduction including presentation of problem statement, signed and dated research questions(s), limitation of scope and approaches.

-
- background, theories, methods, analysis, including descriptions of and arguments for your choice of components etc. to answer the research questions(s).
 - conclusion (*remember that the introduction/problem statement and the conclusion must relate to each other. In principle, one should be able to understand them without reading the background and analysis chapters*).
 - discussion in which you place your research and findings in a wider context.
 - reference list (*including all sources that are referred to in the project*)
 - list of appendices (*number and title of all appendices included in the report*)
 - appendix (*only include appendices that are central to the report*).

The length of the final exam project depends on the number of students writing it:

For students who work alone, report length must be between 45,000 and 55,000 characters plus appendices.

For teams of two students, report length must be between 55,000 and 65,000 characters plus appendices.

For teams of three students, report length must be between 65,000 and 75,000 characters plus appendices.

For teams of four students, report length must be between 75,000 and 85,000 characters plus appendices.

One standard page is 2,400 characters including spaces and foot notes. The cover page, table of contents, reference list and appendices do not count towards the limit. Appendices are not assessed.

All project material must be submitted as one single PDF file, including appendices.

Spelling and writing skills

Spelling and writing skills will be assessed as part of the assessment and grading of the final exam project. The assessment is expressed as an overall assessment of the professional and academic content as well as the student's spelling and writing skills.

Students may apply for an exemption from the requirement that spelling and writing skills form part of the assessment criteria if the application is supported by documentary evidence of a specific, relevant physical or mental impairment. The application should be submitted to the programme and directed to the attention of the programme director not later than 4 weeks before the exam is to be held.

Learning outcomes

The final exam project must demonstrate that the student has achieved the expected level of graduate competence. See Schedule 1 of the Study Programme Order.

Assessment

The exam is made up of a written project and an oral performance. A single, total grade will be given according to the 7-point grading scale for the written and oral performances.

The final exam project examination cannot take place until the internship exam and the other exams of the study programme have been passed.

For the examination type and exam procedure, please see the institutional section section of this Curriculum.

Order of examinations by semester

Table of examinations

Taught:	Exam		120 ECTS distributed across examinations	Assessment
1st semester	Academic aptitude examination (if required)	Internally assessed		Pass/fail
1st semester	First-semester examination (s) PLC and HMI Programming 1. (10 ECTS) Mathematics and Physics (5 ECTS) Electrical Technology (5 ECTS) Technology and project development (5 ECTS) Project Management (5 ECTS)	Internally assessed	30	7-point grading scale
2nd semester	First-year examination Control technology, configuration and programming (5 ECTS) Mechanical and physical modelling (5 ECTS) Electronic systems design and project development (5 ECTS) Process control technology (5 ECTS) Configuration and programming, operator interface and communications technology (5 ECTS) Innovation (5 ECTS)	Externally assessed	30	7-point grading scale
2nd semester	Elective component examination(s) (See the institutional section of the Curriculum)	Internally assessed		7-point grading scale
3rd semester	Third-semester examination 3a Business Knowledge (5 ECTS)	Internally assessed	5	7-point grading scale
3rd semester	Third-semester examination 3b Technical project Communications Technology, Data Processing and Data Exchange (5 ECTS) Optimisation, monitoring and operator interface (5 ECTS)	Internally assessed	10	7-point grading scale
3rd semester	Elective component examination(s)	Internally assessed	15	7-point grading scale
4th semester	Internship examination	Internally assessed	15	7-point grading scale
4th semester	Final exam project	Externally assessed	15	7-point grading scale

If an academic aptitude examination is required, it will be described in the institutional section of the curriculum.

The elective components and the related examinations are described in the institutional section of this Curriculum.

Each exam project must be submitted electronically in PDF format as a single file to the educational institution conducting the examination. The educational institutions conducting the examination will make sure

that all external examiners will have access to the projects in question when they have been submitted.

7. Examinations that are common to all approved providers of the study programme

The Automation Engineering Programme features the examinations shown in the "table of examinations" above.

Elective component examinations must have been passed with a grade of 02 in order for the student to attend the final exam project examination.

Assessment

Usually 1 to 3 examiners from the student's teacher or supervisor group and one external examiner will attend externally assessed examinations. The project report makes up the examination basis.

Credit transfer

Passed educational components are equivalent to corresponding educational components offered by other educational institutions offering the programme.

The student has a duty to inform the educational institution about educational components that were studied and passed at other Danish or foreign educational institutions and to inform about occupations that can be assumed to earn the student transfer credit. The educational institution will grant transfer credit in each individual case based on completed/passed educational components and occupations that match course units, parts of the study programme or parts of the internship. The decision to award transfer credit is based on an assessment of discipline-specific elements.

Pre-approved credit transfer

Students can apply for pre-approval of credit transfer. In cases of pre-approved credit transfer of studies in Denmark or abroad, students are under a duty to document completion of the pre-approved educational components, upon completion of the study-abroad period. When applying for pre-approval, students must consent to allow the educational institution to collect any required information upon the student's completion of the study-abroad period.

For the final approval of pre-approved credit transfer, the educational component is considered completed if it is passed in accordance with the regulations applying to the study programme.

8. Exemption

The educational institution may grant exemption from those rules in the national section of this Curriculum that were laid down solely by the educational institutions, when exemption is substantiated by exceptional circumstances. The educational institutions co-operate on a uniform exemption practice.

9. Effective date

This national section of the curriculum comes into effect on 15 August 2014 and applies to all students who are and will be registered for the programme commenced on said date or thereafter.

10. INSTITUTIONAL CURRICULUM

Curriculum – institutional section – the Academy Profession Degree Programme in Automation Engineering

11. School organisation

University College of Northern Denmark (UCN) is an institution of higher education based in the North Jutland region of Denmark. Technology and Business are the two schools for the technical and the business-related study programmes. The schools have shared premises at these addresses: Sofiendalsvej 60, Lindholm Brygge 35 and Porthusgade 1 in the city of Aalborg and Nørresundby.

The Automation Engineering programme is based at Sofiendalsvej.

12. Where to find the curriculum

The curriculum is available to students on the intranet.

Furthermore, the curriculum is available to all interested parties on UCN's website: www.ucnorth.dk

The Ministry of Higher Education and Science, external examiners and relevant educational institutions will be notified of the curriculum and any changes made to it.

13. Course of the programme

The study programme is divided into 4 semesters, each with an overall theme. In each semester students must work on multidisciplinary projects. The main contents of the projects are described later in this curriculum.

1st semester		2nd semester		3rd semester		4th semester	
Machines		Automatic systems		Production and process plants		The automation engineering profession	
Project 1a: small machines	Project 1b: machines	Project 2a: Automated plant	Project 2b: Automated plant	Project 3a: Business knowledge	Project 3b: production plant and/or process plants	Internship	Final exam project
		Elective		Elective			

Order of examinations by semester

Table of all examinations and their order

Taught:	Examination		120 ECTS Distributed across examinations	Assessment
1st semester	Academic aptitude examination	Internally assessed		Pass/fail
1st semester	First-semester examination (s) PLC and HMI Programming 1. (10 ECTS) Mathematics and Physics (5 ECTS) Electrical Technology (5 ECTS) Technology and project development (5 ECTS) Project Management (5 ECTS)	Internally assessed	30	7-point grading scale
2nd semester	First-year examination Control Technology, Configuration and Programming (5 ECTS) Mechanical and Physical Modelling (5 ECTS) Electronic Systems Design and Project Development (5 ECTS) Process Control Technology (5 ECTS) Configuration and Programming, Operator Interface and Communications Technology (5 ECTS) Innovation (5 ECTS)	Externally assessed	30	7-point grading scale
2nd semester	Elective component examination 2.1 (Part of the first-year examination)	Internally assessed		7-point grading scale
2nd semester	Elective component examination 2.2 (Part of the first-year examination)	Internally assessed		7-point grading scale
3rd semester	Third-semester examination 3a Business Knowledge (5 ECTS)	Internally assessed	5	7-point grading scale
3rd semester	Third-semester examination 3b Technical project Communications Technology, Data Processing and Data Exchange (5 ECTS) Optimisation, Monitoring and Operator Interface (5 ECTS)	Internally assessed	10	7-point grading scale
3rd semester	Elective component examination 3.1	Internally assessed	5	7-point grading scale
3rd semester	Elective component examination 3.2	Internally assessed	5	7-point grading scale
3rd semester	Elective component examination 3.3	Internally assessed	5	7-point grading scale
4th semester	Internship examination	Internally assessed	15	7-point grading scale
4th semester	Final exam project	Externally assessed	15	7-point grading scale

Information about the time and venue for each exam can be found on Canvas.

14. Distribution of components

The compulsory educational components described in the national curriculum above are distributed across the 4 semesters according to the table below:

Automation Engineering (AP) Distribution of compulsory educational components	ECTS				Total:
	1st sem.	2nd sem.	3rd sem.	4th sem.	
Design and construction of automatic units (Core area 1)	20	5			25
<i>Control Technology, configuration and programming PLC and HMI Programming 1 PLC and HMI Programming 2</i>	10	5			15
<i>Mechanical and physical modelling Mathematics and Physics</i>	5				5
<i>Electric systems design and project development Electrical Technology</i>	5				5
Integrating automatic units (Core area 2)	5	10			15
<i>Process control technology</i>		5			5
<i>Configuration and programming, operator interface and communications technology Technology and Project development</i>	5	5			10
Systems design of automatic process and production lines (Core area 3)			10		10
<i>Communications technology, data processing and data exchange</i>			5		5
<i>Optimisation, monitoring and operator interface</i>			5		5
Business-related elements (Core area 4)	5	5	5		15
<i>Innovation</i>		5			5
<i>Business knowledge</i>			5		5
<i>Project management</i>	5				5
Elective educational components		10	15		25
<i>Elective component 2.1</i>		5			5
<i>Elective component 2.2</i>		5			5
<i>Elective component 3.1</i>			5		5
<i>Elective component 3.2</i>			5		5
<i>Elective component 3.3</i>			5		5
Internship				15	15
Final exam project				15	15
Total	30	30	30	30	120

15. Framework and criteria for the examinations on the study programme

Definitions

Individual assessment is an assessment of an individual examinee's performance – all examinations always require individual assessment.

Independent assessment is an assessment of e.g. both the oral presentation and the written presentation/a grade for the oral performance and a grade for the written performance.

Non-independent assessment is a total, cumulative assessment of e.g. the oral performance and the written performance.

Individual examination is defined as an examination of a single examinee – this means that the examinee will be the only examinee in the exam room – followed by assessment/grading.

Group examination is defined as a simultaneous examination of a group of examinees – this means that the examinees remain together during the examination – followed by assessment/grading of each student.

Group assignment is a written or practical product made by a group of students.

Examination basis is the total amount of material that can be used to examine an examinee at a given examination.

Assessment basis is the examinee's performance at the examination.

In the Automation Engineering programme, a total, cumulative assessment/grade will be given for the written and oral performances and the written element makes up the examination basis. The written element must meet the requirements specified for the particular examination.

Academic aptitude examination

Exam type and design

The examination is an internally assessed, individual multiple choice examination.

Exam contents and requirements

The exam is based on the lectures and activities that took place in the time from study start until the date of the examination. The objective of the examination is to determine whether students have in fact commenced their study.

Students must submit the material that was handed out to them including their answer papers.

The cover page of the assignment must include the submission date, the study programme name, the name of the student, the student's student number, class name and the number of standard pages/characters including spaces.

The student's knowledge of different academic/non-academic elements that are not part of the learning outcomes for the programme will be examined, just as the student's knowledge and use of the study programme's various IT systems or knowledge of relevant staff and contact persons will be examined.

Scheduled time

The academic aptitude examination will take place no later than two months after study programme start. Resit exams will be held not later than three months after study programme start. Further information about the examination time and venue can be found in the semester plan and will be announced on Canvas.

Form of assessment

Pass/fail

Examination ECTS credits

This examination does not earn students and ECTS credits and is not featured on the degree certificate.

Assessment criteria

The examination will be assessed pass/fail based on an overall evaluation of the student's answers. If a student fails the examination, the student will have the opportunity to resit the examination not later than three months after study programme start. This means that the student has a total number of two attempts to pass the examination.

If the examination is failed

If the student does not pass the resit examination, the student will be de-registered from the study programme in accordance with Ministerial Order no. 223 of 11 March 2014 on admission to academy profession degree programmes and professional bachelor's degree programmes (the Admission Order).

Complaints

Students cannot lodge a complaint about the exam.

Exemption

The study programme may exempt individual students from the deadlines that have been set for passing the academic aptitude examination if the exemption is due to illness, maternity or paternity leave or exceptional circumstances.

16. Theme/projects

The first-semester theme is machines

Objective

The objective of the projects in the first semester is to give students the opportunity to work in an interdisciplinary, continuous course of planning and designing the automation system in a machine in accordance with current norms and regulations.

Students will achieve insight and experience in planning, designing, implementing, programming, running, inspecting and maintaining automatic machines.

Students will be able to assess possibilities and select relevant solutions while taking operations, comfort and energy consumption into consideration.

Project 1a and project 1b

Contents and extent of project 1a and project 1b in the semester plan.

In the first half of the first semester, project 1a will be made, based on a small machine.

A second project, project 1b, will be carried out in the second half of the first semester, based on a machine.

Project 1b is the first-semester examination.

First-semester examination(s): Project 1b: The Machine

The first-semester examinations are focusing on the educational component; the machine and the elements within the subject areas:

Design and construction of automatic units

PLC and HMI Programming 10 ECTS

Mathematics and Physics 5 ECTS

Electrical Technology 5 ECTS

Integrating automatic units

Technology and project development 5 ECTS

Business-related elements

Project management 5 ECTS

Examination prerequisites

Students must meet the following requirements to sit the exam:

- Approved submission and participation in the evaluation of project 1a (Theme: small machine)

If the student fails to meet all the requirements for the examination, the student has used an examination attempt and thus has two examination attempts left to pass the exam.

Formal requirements for the written project

Students must write a report.

The report should include:

- a cover page with title and names of the group members, class, date, year and UCN
- an optional title page
- a table of contents including a list of the students who were responsible for the individual sections of the report
- abstract/synopsis
- introduction including presentation of problem statement, research questions(s), limitation of scope and approaches
- background, theories, methods, analysis, including descriptions of and arguments for the choice of the equipment and technologies used
- conclusion (remember that the introduction and the conclusion must relate to each other). In principle, one should be able to understand them without reading the background and analysis chapters).
- reference list (including all sources that are referred to in the project.)

The minimum required length of each report is:

For students who work alone, report length must be between 45,000 and 55,000 characters plus appendices.

For teams of two students, report length must be between 55,000 and 65,000 characters plus appendices.

For teams of three students, report length must be between 65,000 and 75,000 characters plus appendices.

For teams of four students, report length must be between 75,000 and 85,000 characters plus appendices.

One standard page is 2,400 characters including spaces and foot notes. The cover page, title page, table of contents, reference list and appendices do not count toward the limit.

The report and any appendices must be submitted as a single PDF file.

Rules and description of the oral presentation of the project report

The group must present the written project report.

The group must have 1–4 students.

There will be ten minutes for the presentation plus 15–20 minutes per group member for a discussion and questions to the presentation including responses from the supervisors.

(I.e. for groups of two students, there will be 60 minutes. For groups of three students, there will be 90 minutes. For groups of four students, there will be 120 minutes.)

Examination procedure

The exam is an externally assessed, individual oral examination based on a written group project, and it is graded according to the 7-point grading scale. Students will receive a single, total grade.

A group must have 1–4 students.

There will be ten minutes for the presentation plus 15–20 minutes per group member for questioning including a response.

(I.e. for groups of two students, there will be 60 minutes. For groups of three students, there will be 90 minutes. For groups of four students, there will be 120 minutes.)

ECTS credits

The examination is worth a total of 30 ECTS credits.

Assessment criteria

The assessment criteria for the examination are identical to the learning outcomes for the compulsory educational components in the first semester.

The learning outcomes can be found in the national section of the curriculum.

The second-semester theme is: The Automatic Systems.

Objective

The objective of the projects in the second semester is to give students the opportunity to work in an interdisciplinary, continuous project on automatic systems in accordance with current norms and regulations. Students will achieve insight and experience in planning, designing, implementing, programming, running, inspecting and maintaining automatic systems, automated machinery as well as planning, designing and implementing automation using automation technologies.

Furthermore, students will gain an understanding of automatic and electrical installations used in machinery and plant.

Students will be able to assess automation options and select solutions relevant to different facilities while taking operation, comfort, energy consumption and economic parameters into consideration.

The contents and extent of project 2a can be found in the semester plan. The requirements for project 2b (first year assignment) are described below.

In the first half of the second semester project 2a, based on an automatic system, is made based on an automatic system.

A second project, project 2b, will be carried out in the second half of the second semester, based on a more complex automatic system. Project 2a is also the project for the first year examination.

The first year examination

The first year examination covers the examination of the following compulsory educational components:

- Control technology, configuration and programming (5 ECTS)
- Mechanical and physical modelling (5 ECTS)
- Electric systems design and project development (5 ECTS)
- Process control technology (5 ECTS)
- Configuration and programming, operator interface and communications technology (5 ECTS)
- Innovation (5 ECTS)

Examination prerequisites, including obligation to participate

Students must meet the following requirements in order to sit the exam:

- Approved participation in project 1a (Theme: small machines)
- Approved participation in project 1b with a grade of at least 02 (Theme: machines)
- Approved participation in project 2a (Theme: automatic systems)

For each project learning period, students must write up and submit a report and an oral project presentation must be made. The written project must satisfy the formal requirements, see below, and be submitted in due time, see the schedule on Canvas, and the students must take part in the oral presentation.

Non-performance of one or more of the described examination prerequisites or incorrect submission of the written projects means that students cannot sit the exam and that an exam attempt will have been used.

Formal requirements for the written project

Students must write a report.

The report should include:

- a cover page with title and names of the group members, class, date, year and UCN
- an optional title page
- a table of contents including a list of the students who were responsible for the individual sections of the report
- abstract/synopsis
- introduction including presentation of problem statement, research questions(s), limitation of scope and approaches
- background, theories, methods, analysis, including descriptions of and arguments for the choice of the equipment and technologies used
- conclusion (remember that the introduction and the conclusion must relate to each other). In principle, one should be able to understand them without reading the background and analysis chapters).
- reference list (including all sources that are referred to in the project.)

The minimum required length of each report is:

For students who work alone, report length must be between 45,000 and 55,000 characters plus appendices.

For teams of two students, report length must be between 55,000 and 65,000 characters plus appendices.

For teams of three students, report length must be between 65,000 and 75,000 characters plus appendices.

For teams of four students, report length must be between 75,000 and 85,000 characters plus appendices.

One standard page is 2,400 characters including spaces and foot notes. The cover page, title page, table of contents, reference list and appendices do not count toward the limit.

The report and any appendices must be submitted as a single PDF file.

Rules and description of the oral presentation of the project report

The group must present the written project report.

The group must have 1–4 students.

There will be ten minutes for the presentation plus 15–20 minutes per group member for a discussion and questions to the presentation including responses from the supervisors.

(I.e. for groups of two students, there will be 60 minutes. For groups of three students, there will be 90 minutes. For groups of four students, there will be 120 minutes.)

Examination procedure

The exam is an externally assessed, individual oral examination based on a written group project, and it is graded according to the 7-point grading scale. Students will receive a single, total grade.

A group must have 1–4 students.

There will be ten minutes for the presentation plus 15–20 minutes per group member for questioning including a response.

(I.e. for groups of two students, there will be 60 minutes. For groups of three students, there will be 90 minutes. For groups of four students, there will be 120 minutes.)

The examination is worth a total of 30 ECTS credits.

Assessment criteria

The assessment criteria for the examination are identical to the learning outcomes for the compulsory educational components in the first and second semesters.

The learning outcomes can be found in the national section of the curriculum.

Scheduled time

The exam will take place in the second semester. Further information about time, location and submission of the written project can be found on Canvas.

Examination language

English

The exam must be passed with a grade of at least 02 before the start of the second year of study in order for students to continue their study.

UCN may exempt individual students from the deadlines that have been set for passing the examination if the exemption is due to illness, maternity or paternity leave or exceptional circumstances.

Elective educational components 2.1 and 2.2

Content

The elective educational components give the student the opportunity to qualify study-related and professional competencies through specialisation and elaboration on subjects that are broadly related to automation.

Each year at least two elective components will be offered, their descriptions being made available on Canvas.

Students may also design and plan their elective components by themselves as a theoretical and/or a practical learning period, which must be approved by UCN.

Learning outcomes

Knowledge

Upon completion students should be able to:

- understand and reflect on the theory and practice of the selected topic(s)
- describe and explain the relevance of the selected topic(s) to the theory and practices of the automation profession.

Skills

Upon completion students should have acquired the skills to to:

- select, describe and perform literature searches for a problem or issue they selected within the automation discipline
- discuss process-related and analytical skills related to the selected topic(s)
- assess problems and suggest possible solutions for the selected topic(s)
- communicate central results.

Competencies

Upon completion students should have acquired the competencies to:

- independently acquaint themselves with new topics within the theory or practice of the subject field
- elaborate on and relate the chosen topic(s) to the other subject fields of the study programme.

Examinations for elective educational components 2.1 and 2.2

The examination includes the examination of elective educational component no. 2.1.

The examination includes the examination of elective educational component no. 2.2.

Formal requirements for the written project

Students must write a report.

The report should include:

- Cover page with title and name, class, date, year and UCN.
- an optional title page
- table of contents
- introduction including a presentation of the problem statement, research question(s) and approaches
- background, theories, methods, analysis, including descriptions of and arguments for the choice of the equipment and technologies used
- conclusion (remember that the introduction and the conclusion must relate to each other). In principle, one should be able to understand them without reading the background and analysis chapters)
- reference list (including all sources that are referred to in the project)

The minimum required length of each report is as follows:

Students must work alone, and report length must be a minimum of 10,000 and a maximum of 24,000 characters plus appendices.

One standard page is 2,400 characters including spaces and foot notes. The cover page, title page, table of contents, reference list and appendices do not count toward the limit.

The report and any appendices must be submitted as a single PDF file.

Examination procedure

The exam is an internally assessed, individual, written examination based on a written report, and it is graded according to the 7-point grading scale. Students will receive a single, total grade.

The examination is worth 5 ECTS credits per elective educational component.

Assessment criteria

The assessment criteria for the examination are identical to the learning outcomes for the elective educational components in the first year of study.

The learning outcomes can be found in the institutional section of the curriculum.

Scheduled time

The exam will take place in the second semester. Further information about time, location and submission of the written project can be found on Canvas.

Examination language

English

UCN may exempt individual students from the deadlines that have been set for passing the examination if the exemption is due to illness, maternity or paternity leave or exceptional circumstances.

The third-semester theme is production and process plants

Objective

The objective of business development project 3a in the third semester is for students to gain an insight into the business-related aspects of developing a business, generating ideas for a business/product, innovation, project development, taking over an existing business or entering into a partnership.

The purpose of Production and Process Plants project 3b in the third semester is to give students the opportunity to work in a multidisciplinary, continuous course of project planning focused on production or process plants in accordance with current norms and regulations.

Students will gain an insight and experience in planning, designing, implementing, programming, running, inspecting and maintaining automatic systems.

Furthermore, students will acquire an understanding of the documentation used in connection with automation and machines.

Students will be able to assess the viability of different solutions while taking operation, energy consumption and economic parameters into consideration.

In the first half of the third semester, students must prepare project 3a (third-semester examination 3a) based on business knowledge.

In the second half of the third semester, students must carry out project 3b (third-semester examination 3b) based on a production and process plant.

Third-semester examination 3a (Business knowledge)

Third-semester examination 3a covers the examination of the following compulsory educational components:

- Business knowledge (5 ECTS)

Examination procedure

The exam is an internally assessed, individual, oral examination based on a written assignment (synopsis and presentation portfolio), and it is graded according to the 7-point grading scale. Students will receive a single, total grade.

The examination is worth a total of 5 ECTS credits.

The group must have 1–4 students.

Formal requirements for written work

Students must prepare a synopsis and a presentation portfolio.

The synopsis should include:

- cover page with title and names of the members of the group
- optional title page

-
- table of contents
 - introduction including presentation of problem statement and research question(s)
 - background, methods, analysis and empirical data to answer the research question(s)
 - conclusion
 - optional discussion in which you place your research and findings in a wider context
 - reference list (including all sources that are referred to in the project)
 - appendices, if any.

The minimum required length of the synopsis is:

- between 5,000 and 7,500 characters plus appendices for students who work alone
- between 7,500 and 10,000 characters plus appendices for groups of two students
- between 10,000 and 12,500 characters plus appendices for groups of three students
- between 12,500 and 15,000 characters plus appendices for groups of four students.

One standard page is 2,400 characters including spaces and foot notes. The cover page, title page, table of contents, reference list and appendices do not count toward the limit.

The synopsis and any appendices must be submitted as a single PDF file.

The presentation portfolio should include:

- descriptions and explanations
- calculations/computations
- results
- technical documentation

The minimum required length of the presentation portfolio is between 12,000 and 240,000 characters plus appendices for students who work alone or in groups.

The presentation portfolio and any appendices must be submitted as a single PDF file.

Rules and description of the oral presentation of the synopsis and presentation portfolio

The group will present the written synopsis and the presentation portfolio.

The group must have 1–4 students.

There will be ten minutes for the presentation plus 15–20 minutes per group member for a discussion and questions to the presentation including responses from the supervisors.

(This means that groups of two students will be allowed 60 minutes; groups of three students will be allowed 90 minutes; groups of four students will be allowed 120 minutes.)

Assessment criteria

The assessment criteria for the examination are identical to the learning outcomes for the compulsory educational components for the third semester.

The learning outcomes can be found in the national section of the curriculum.

Scheduled time

The exam will take place in the third semester. Further information about time, location and submission of the written work (synopsis and presentation portfolio) can be found on Canvas.

Examination language

English

UCN may exempt individual students from the deadlines that have been set for passing the examination if the exemption is due to illness, maternity or paternity leave or exceptional circumstances.

Third-semester examination 3b (Production and process plants)

Third-semester examination 3b comprises the examination of the following compulsory educational components:

- communications technology, data processing and data exchange (5 ECTS credits)
- optimisation, monitoring and operator interface (5 ECTS credits)

Examination procedure

The exam is an internally assessed, individual oral examination based on a written group project, and it is graded according to the 7-point grading scale. Students will receive a single, total grade.

The examination is worth a total of 10 ECTS credits.

A group must have 1–4 students.

Formal requirements for the written project

Students must write a report.

The report should include:

- a cover page with title and names of the group members, class, date, year and UCN
- optional title page
- a table of contents including a list of the students who were responsible for the individual sections of the report
- abstract/synopsis
- introduction including presentation of problem statement, research question(s), limitation of scope and approaches
- background, theories, methods, analysis, including descriptions of and arguments for the choice of the equipment and technologies used
- conclusion (remember that the introduction and the conclusion must relate to each other). In principle, one should be able to understand them without reading the background and analysis chapters)
- reference list (including all sources that are referred to in the project).

The minimum required length of each report is as follows:

For students who work alone, report length must be between 45,000 and 55,000 characters plus appendices.

For teams of two students, report length must be between 55,000 and 65,000 characters plus appendices.

For teams of three students, report length be between 65,000 and 75,000 characters plus appendices.

For teams of four students, report length must be between 75,000 and 85,000 characters plus appendices.

One standard page is 2,400 characters including spaces and foot notes. The cover page, title page, table of contents, reference list and appendices do not count toward the limit.

The report and any appendices must be submitted as a single PDF file.

Rules and description of the oral presentation of the project report

The group must present the written project report.

The group must have 1–4 students.

There will be ten minutes for the presentation plus 15–20 minutes per group member for a discussion and questions to the presentation including responses from the supervisors.

(This means that groups of two students will be allowed 60 minutes; groups of three students will be allowed 90 minutes; groups of four students will be allowed 120 minutes.)

Assessment criteria

The assessment criteria for the examination are identical to the learning outcomes for the compulsory educational components for the third semester.

The learning outcomes can be found in the national section of the curriculum.

Scheduled time

The exam will take place in the third semester. Further information about time, location and submission of the written project can be found on Canvas.

Examination language

English

UCN may exempt individual students from the deadlines that have been set for passing the examination if the exemption is due to illness, maternity or paternity leave or exceptional circumstances.

Elective educational components 3.1, 3.2 and 3.3

Contents

The elective educational components give the student the opportunity to qualify study-related and professional competencies through specialisation and elaboration on subjects that are broadly related to automation.

Every year at least three elective components will be offered, their descriptions being made available on eCampus.

Students may also design and plan their elective components on their own either as a theoretical and/or a practical learning process, which must be approved by the study programme.

Learning outcomes

Knowledge

Upon completion students should be able to:

- understand and reflect on the theory and practice of the selected topic(s)
- describe and explain the relevance of the selected topic(s) to the theory and practices of the automation profession.

Skills

Upon completion students should have acquired the skills to:

- select, describe and perform literature searches for a problem or issue they selected within the automation discipline
- discuss process-related and analytical skills related to the selected topic(s)
- assess problems and suggest possible solutions for the selected topic(s)
- communicate central results.

Competencies

Upon completion of the course students should have acquired the competencies to:

- independently acquaint themselves with new topics within the theory or practice of the subject field
- elaborate on and relate the chosen topic(s) to the other subject fields of the study programme.

Examinations for elective educational components 3.1, 3.2 and 3.3

The examination includes the examination of elective educational component no. 3.1

The examination includes the examination of elective educational component no. 3.2

The examination includes the examination of elective educational component no. 3.3

Formal requirements for the written project

Students must write a report.

The report must include:

- cover page with title and name, class, date, year and UCN.
- optional title page
- table of contents
- introduction including a presentation of the problem statement, research question(s) and approaches
- background, theories, methods, analysis, including descriptions of and arguments for the choice of the equipment and technologies used
- conclusion (remember that the introduction and the conclusion must relate to each other), in principle, one should be able to understand them without reading the background and analysis chapters)
- reference list (including all sources that are referred to in the project).

The minimum required length of the each report:

Students must work alone, and report length must be a minimum of 10,000 and a maximum of 24,000 characters plus appendices.

One standard page is 2,400 characters including spaces and foot notes. The cover page, title page, table of contents, reference list and appendices do not count toward the limit.

The report and any appendices must be submitted as a single PDF file.

Examination procedure

The exam is an internally assessed, individual, written examination based on a written report, and it is graded according to the 7-point grading scale. Students will receive a single, total grade.

The examination is worth 5 ECTS credits per elective educational component.

Assessment criteria

The assessment criteria for the examination are identical to the learning outcomes for the elective educational components in the second year of study.

The learning outcomes can be found in the institutional section of the curriculum.

Scheduled time

The exam will take place in the third semester. Further information about time, location and submission of the written project can be found on Canvas.

Examination language

English

UCN may exempt individual students from the deadlines that have been set for passing the examination if the exemption is due to illness, maternity or paternity leave or exceptional circumstances.

The fourth-semester theme is the automation engineering profession

The semester comprises an internship and the final exam project.

Objective

During the internship, students must work with issues relevant to the profession and achieve knowledge of relevant job functions that automation engineers perform.

Students must try out their knowledge of automation engineering tasks, methods, tools and equipment. Furthermore, students must independently assess and perform relevant automation tasks. Finally, students must deal with relevant situations and issues in a professional way.

Internship

Internship requirements and expectations

During the internship, students will work on issues that are relevant to the profession and lie within the core areas of the study programme while achieving knowledge of relevant job functions. Students will be associated with one or more internship hosts over the course of the internship. The internship may be organised in a flexible and personalised manner and may form the basis of the students' final exam project.

Based on the internship's learning outcomes, see the national section of this Curriculum, the student and the supervisor/contact person will collaborate on setting specific objectives for the student's internship. The objectives must be written down.

These objectives will then guide how the student's work during the internship should be planned. The internship should be considered similar to a full-time job with the same requirements in terms of number of working hours, effort, commitment and flexibility that AP graduates in Automation Engineering can expect to meet in their first job.

The internship may be adapted and organised in a flexible manner and may form the basis of the students' final exam project.

Examination prerequisites

Students must meet the following requirements in order to sit the exam:

- The requirements of the Internship Portal must be met, e.g. filling in the internship contract, learning outcomes, log book etc.
- The written report that makes up the assessment and examination basis must:
- meet the formal requirements stated below, and
- be submitted in due time according to the exam plan on Canvas.

Non-performance of one or more of the described examination prerequisites or incorrect submission of the written report means that a student cannot sit the exam and that an exam attempt will have been used.

Formal requirements for the written internship report

The report should include:

- cover page with title
- table of contents
- abstract/synopsis
- learning outcomes defined in the Internship Portal

-
- reflections on the learning outcomes
 - discussion of positive and negative experiences from the internship
 - conclusion on the accomplishment of the learning outcomes
 - appendix (only include appendices that are central to the report).

The length of the project must be between 10.000 and 24.000 characters.

One standard page is 2,400 characters including spaces and foot notes. The cover page, table of contents, reference list and appendices do not count towards the limit.

Examination procedure

Individual internally assessed written report. Assessed according to the 7-point grading scale.

The examination is worth a total of 15 ECTS credits.

Assessment criteria

The assessment criteria for the examination are identical to the learning outcomes for the internship.

The learning outcomes can be found in the national section of the curriculum.

Scheduled time

The exam will take place in the fourth semester. Information about the time and venue for the examination can be found on Canvas.

Examination language

English

UCN may exempt individual students from the deadlines that have been set for passing the examination if the exemption is due to illness, maternity or paternity leave or exceptional circumstances.

Final exam project

For a description of the final exam project requirements and learning outcomes, please see the national section of this curriculum.

Examination prerequisites, including obligation to participate

The following requirements, including the obligation to participate must be met in order for students to sit the examination:

- The first year examination must have been approved and have achieved at least the grade 02.
- Elective educational component 2.1 must have been approved and have achieved at least the grade 02.
- Elective educational component 2.2 must have been approved and have achieved at least the grade 02.
- The third-semester examination 3a must have been approved and have achieved at least the grade 02.
- The third-semester examination 3b must have been approved and have achieved at least the grade 02.
- Elective educational component 3.1 must have been approved and have achieved at least the grade 02.
- Elective educational component 3.2 must have been approved and have achieved at least the grade 02.
- Elective educational component 3.3 must have been approved and have achieved at least the grade 02.
- The internship examination must have been approved and have achieved at least the grade 02.

The written project that makes up both the assessment and examination basis must meet the formal requirements for the final exam project, see the national section of this Curriculum, and be submitted in due time, see the exam schedule on Canvas.

Non-performance of one or more of the described examination prerequisites or incorrect submission of the written project that makes up the written element of the examination means that a student cannot sit the exam and that an exam attempt will have been used.

Examination procedure

The examination is an externally assessed, oral examination based on a written project. The written and oral performances are assessed as a whole, leading to a single grade. The examination is assessed and graded according to the 7-point grading scale.

A group may have up to 4 members.

The following number of minutes are allowed for the examination, including time for deliberations, depending on the number of students in the group:

- Students who work alone: 50 min., presentation time: 20 min.
- Groups of two students: 100 min.
- Groups of three students: 150 min.
- Groups of four students: 200 min.

The examination is worth a total of 15 ECTS credits.

Assessment criteria

The assessment criteria are the same as the learning outcomes for the examination = the learning outcomes for the final exam project, see the national section of this Curriculum.

Scheduled time

The exam will take place in the fourth semester. Information about the time and place can be found on the Canvas.

Examination language

English

The project must be based on central issues contained in the various educational components and the students' elective educational components.

17. Educational components that may take place abroad

Each of the educational components of the study programme may take place abroad if students apply for and are granted pre-approval of credit transfer by the study programme.

In cases of pre-approved credit transfer, students are under a duty to document completion of the pre-approved learning outcomes for each of the educational components, upon completion of the study-abroad period. When applying for pre-approval, students must consent to allow the educational institution to collect any required information upon the student's completion of the study-abroad period.

For the final approval of pre-approved credit transfer, the educational component is considered completed if it is passed in accordance with the regulations applying to the study programme.

18. Learning and teaching methods

In the Automation Engineering programme we use a wide range of teaching and learning methods that combined support the student in achieving the learning outcomes described in this curriculum.

The learning and teaching methods are based on UCN Technology's common learning/teaching approach and on the so-called Blue Model. The learning approach is based on the PULSE philosophy about "The Whole Person" that describes the learning outcome as three dimensional, namely:

- Head: "Knowledge, reflection and the ability to generate ideas"
- Heart: "Personal insight and development, relations and co-operation"
- Legs: "Initiative and responsibility"

The overall teaching methods are dialogue-based, class-taught lessons; and team assignment and project work. However, the programme also features many other activities such as study group work, self-study, individual assignments and projects, presentations in front of groups and the whole class, interdisciplinary theme activities and much more.

Common to all these activities is that the study programme always tries to define (or help students define) clear objectives for the learning activities.

Furthermore, different activities that can help promote learning in the individual are offered: Theme days, after-hours meetings, lectures by external speakers, field trips etc.

Credit transfer for elective educational components

Passed elective educational components are equivalent to the corresponding educational components offered by other Danish providers of this study programme and they are also equivalent to educational components of other study programmes.

If students want transfer credit for educational components not offered by this study programme, credit transfer must be applied for.

Obligation to participate

For the learning and teaching methods of the programme to work as intended, students are under an obligation to participate, which includes an obligation to submit or present assignments and projects.

The obligation to participate may also be a prerequisite of exam participation. Furthermore, some programme elements may impose an obligation to attend.

The description of each examination states whether obligations to participate and any obligations to attend are prerequisite to participating in exams.

Criteria for determining study activity

Registration may be terminated for students who have not complied with the study activity requirements for a continuous period of at least one year.

Study activity is defined as the following requirements: within the past 12 months students must have:

- participated in at least two different exams
- passed at least one exam
- fulfilled the obligations to participate in any kind of activity that is part of the study programme, including group projects, joint projects, distance learning activities etc. as described in this Curriculum
- submitted the assignments, reports, portfolios etc. that are prerequisites for exam participation as described in the curriculum, the coursework being academically honest and not including material that is the copyright of others
- attended activities to which an obligation to attend applies as stated in this Curriculum.
- Non-compliance with one or more criteria in the definition of 'study activity' may be the grounds of termination of registration as a student.

Periods in which the student has not been participating actively in studies due to leave of absence, maternity leave, adoption of a child, verified illness or military service do not count against the period of 12 months required for participating actively in studies. On request, the student must provide documentation of such matters.

The study programme may grant exemption from these provisions in exceptional circumstances. An exemption application should be submitted to the programme director.

Before registration is terminated, the student will be informed in writing. In connection with this notification, the student will be made aware of the above-mentioned rules. In the letter, the student must be informed that they will have 14 days to submit documentary evidence to prove that periods in which they were not participating should not count against their active participation in studies. Furthermore, the student will be notified of the deadline for making an appeal for exemption.

If the student has not responded within the fixed deadline, his/her registration as a student will be terminated.

If the student requests that registration is not terminated, the procedure will be suspended until the programme director has decided the case.

The student may make a complaint to the programme director about the decision within 2 weeks of receipt of the decision. The complaint will suspend the proceedings. If the programme director maintains the decision, the student may appeal to the Ministry of Higher Education and Science within two weeks of receipt of the decision, but only in respect of legal matters.

The rules about the exams that the student must have participated in before the end of the first year of study and passed before the end of the second year of study according to the curriculum, and the deadlines for completion of the education stated in the ministerial order for the study programme, remain in force regardless of the stipulations in this Curriculum.

Language

The teaching materials are in English and the lessons are taught in English.

The students' English skills must meet the requirements of the Admission Order. Students are not required to have any knowledge of foreign languages other than that stated in the Admission Order.

Examination language

Exams must be conducted in understandable Danish or English.

Students whose mother tongue is not English may apply for an exemption from the requirement that writing, and spelling skills must form part of the assessment criteria for the final exam project. The application must be submitted to the programme not later than four weeks before the exam is to take place.

Resits and illness resits

Illness resits

Students who were prevented from attending an exam owing to verified illness or other unforeseen reason will have the opportunity to resit the exam or sit the illness resit as soon as possible. If the exam takes place in the final exam term, the student will have the opportunity to sit the exam in that exam term or immediately after the term.

The illness resit may be identical to the next ordinary exam. It is the students' responsibility to stay informed on when (illness) resit will be held.

Information about the time and place for illness resits can be found on Canvas.

Illness must be verified by medical certificate. The educational institution must receive the medical certificate within three working days after the exam was held. Students who suddenly become ill during an exam must submit documentation verifying that they were ill on the day in question.

If illness is not supported by documentary evidence according to the above rules, the student will have used an exam attempt.

It is the student's responsibility to cover the expense of the medical certificate.

Resits

Where students have failed or not attended an exam, they are automatically registered for a resit, as long as exam attempts remain. A resit exam may be identical to the next ordinary exam.

It is the students' responsibility to stay informed on when resit exams will be held. Information about the time and place for each resit exam can be found on Canvas.

The study programme may grant exemption from automatic exam registration when this is based on exceptional circumstances, including verified disability.

Study aids

Any rules governing the reduced use of study aids at examinations will be stated in the description of the individual exam.

Special exam arrangements

Students may apply for special exam arrangements if a physical or mental impairment qualifies them to do so. The application should be submitted to the study programme not later than four weeks before the exam is to be held. The application deadline may be extended in cases of sudden health-related problems.

With the application students should enclose a medical certificate; a statement from e.g. a speech, hearing, dyslexia or blind institute or other evidence of their condition or a relevant specific impairment.

Students whose mother tongue is not English may apply for permission to bring dictionaries to exams where exam aids are usually not permitted.

Applications for permission to bring other study aids must be submitted to the programme not later than 4 weeks before the exam is to be held.

19. Academic misconduct at exams

When submitting a written exam assignment, students must confirm by signature that the assignment was prepared without undue help.

Use of your own and others' work – plagiarism

Academic misconduct at exams in the form of plagiarism is instances where a written assignment, in full or in part, appears to have been made by the examinee or examinees themselves, even though the assignment:

1. includes identical or near-identical wording of other people's statements or works where the text is not set off by the use of quotation marks, italics, indentation or any other clear indication with a reference to the source, see UCN's requirements to written work
2. includes substantial sections of text that are so similar to another work in wording etc. that by comparison it is clear that the sections could not have been written without the use of the other work
3. includes the use of other's words or ideas without giving due credit to the sources
4. re-uses text and/or central ideas from your own previously assessed works without observing the stipulations in sections 1 and 3.

Disciplinary actions in events of academic misconduct and disruptive behaviour

An examinee who, undoubtedly

- unduly obtains help, or
- helps another student do an assignment, or
- uses non-authorised aids

and

an examinee who behaves in a disruptive manner at an exam may be expelled from the exam room while the exam is taking place by the programme director, by a person authorised by the programme director, or jointly by the assessors. In such cases, the justification of the expulsion from the exam room will be assessed in connection with the subsequent decision on the sanctions to be imposed.

In less serious cases of disruptive behaviour, the student will first be given a warning.

Suspected academic misconduct at exams including plagiarism, during and after the exam

If, during or after an exam, suspicion arises that an examinee

- has obtained or provided undue help,
- has passed off another person's work as their own (plagiarism), or
- has used their own previously assessed work or parts of it without reference (plagiarism)
- this will be reported to the relevant programme.

The process of identifying academic misconduct including plagiarism

Suspension of the exam

If the reported misconduct regards plagiarism in a written assignment that is to make up the basis of assessment for a subsequent oral exam, the programme director will suspend the exam if the matter cannot be settled before the fixed examination date.

Form and contents of the report

Misconduct must be reported without undue delay. The report must include a written presentation of the case with information to identify the reported persons, as well as a brief account of the matter and the existing evidence. Previous incidents of academic misconduct by one or more of the reported students must be stated explicitly.

When plagiarism is reported, the plagiarised sections must be clearly indicated and a reference to their sources stated. The plagiarised text must also be indicated in the source text.

Involving the examinee – hearing of the parties

The programme director decides whether the hearing of the student will be conducted orally, in writing or a combination.

For an oral hearing, the examinee will be summoned for a discussion to clarify the case where they will be presented with the documentation of the suspected academic misconduct and where they will be able to state their point of view. The examinee has a right to bring a companion.

For a written hearing, the documentation of suspected academic misconduct will be sent to the student requesting a written statement of their point of view.

Sanctions against academic misconduct and disruptive behaviour during exams

If the suspected misconduct is confirmed after the matter has been investigated, and if the misconduct has had or will be able to have an influence on the assessment of the student's performance, the programme director will expel the student from the exam.

In less serious offences, the student will first receive a warning.

In aggravating circumstances, the programme director may suspend the student for a period of time at the programme director's discretion. In such cases, the student will receive a written warning that repeated instances of academic misconduct may lead to expulsion.

Suspension means that any grades awarded for the exam in question will be annulled, and that the student will have used an exam attempt.

The student will not be allowed to resit the exam and will have to wait until the next ordinary exam.

In cases of aggravating circumstances, the programme director may decide to suspend the student from the educational institution for a period of time at the programme director's discretion. In such cases, the student will receive a written warning that repeated instances of academic misconduct may lead to expulsion.

The student cannot attend lectures or exams while suspended.

Complaints

The decision that a student has used an exam attempt and is suspended for academic misconduct is final and cannot be brought before a higher administrative authority.

Complaints on the grounds of legal matters (e.g. legal incapacity, the hearing procedure, guidelines on making complaints, correct interpretation of the Ministerial Order on Examinations, Ministerial Order no.1519 of 16 December 2013 on Examinations on Professionally Oriented Higher Education Programmes (the Exam Order) etc.) may be brought before the Danish Agency for Higher Education. The complaint must be brought before the educational institution and directed to the attention of the programme director who will make a statement. The student will have the opportunity to comment on the statement, the deadline being usually one week. The institution will submit the complaint, the statement and any comments made by the student to the Danish Agency for Higher Education. The deadline for complaints made to the institution is two weeks from the day the complainant was notified of the decision, see section 51 of the Exam Order.

Complaints about exams and appeals against decisions

Complaints about exams

Examinees are recommended to seek guidance from a student advisor about the complaints procedure and writing a complaint.

The regulations for complaints about exams can be found in section 10 of the Exam Order.

The Exam Order divides complaints into two kinds,

1. complaints about the examination basis etc., the course of the exam and/or the assessment, and
2. complaints on the grounds of legal irregularities.

The two kinds of complaints are dealt with differently.

Complaints about the examination basis etc. the course of the exam and the assessment

Within two weeks after the assessment of the exam has been announced in the usual way, an examinee may submit a written, substantiated complaint about:

1. the exam basis including the exam questions, assignments etc. and its connection to the purpose and requirements of the programme
2. the examination procedure
3. the assessment.

The complaint may concern any exam including written examinations, oral examinations and combined exams as well as practical, clinical or laboratory exams.

The complaint should be submitted to the relevant programme director.

The complaint will immediately be brought before the original assessors, i.e. the examiner and the external examiner from the exam in question. The statement made by the assessors must be usable as the base of the institution's decision regarding academic or professional matters. The institution will usually give the assessors a deadline of 2 weeks to make their statements.

Immediately after the statements are made available, the complainant will be given the opportunity to comment on them within, usually, one week.

The decision will be made by the institution based on the discipline-specific statements made by the assessors and any comments made by the complainant.

The decision must be made in writing and must include a rationale. It may regard

1. an offer of a new assessment (re-assessment). This only applies to written examinations
2. an offer of a new examination (resit)
3. a dismissal of the complaint.

If it is decided that the student will be offered re-assessment or a resit exam, the programme director will appoint new assessors. Re-assessment may only be offered in cases of written exams where written material exists for assessment, as new assessors will not be able to (re-)assess an already held oral exam and as the notes of the original assessors are personal and cannot be passed on to others.

If the decision is to offer the complainant a re-assessment or resit exam, the complainant must be notified that a re-assessment or a resit exam may result in a lower grade. The complainant must accept the offer within 2 weeks of the announcement of the decision. Acceptance of an offer of re-assessment or a resit exam cannot be cancelled. If the student does not accept the offer within the deadline, re-assessment or a resit exam will not be carried out.

Re-assessment or a resit examination must take place as soon as possible.

On re-assessment, the assessors must be presented with the case documents: The exam paper, the complainant's assignment, the statements made by the original assessors with the comments made by the student, and the decision made by the institution.

The assessors will deliver the result of the re-assessment including a written explanation as well as their assessment. Resit exams and re-assessments may result in lower grades than the initial grades.

If it is decided that a re-assessment or resit exam will be offered, the decision will apply to all students who took the exam in question if their assignment features the same deficiency as the one complained about. The complaint must be submitted to the programme director not later than 2 weeks (14 calendar days) after the assessment results of the exam in question have been announced. If the deadline falls on a holiday, the deadline will be extended to expire on the first weekday after that day. In exceptional circumstances, the deadline may be disregarded.

Appeals

The appellant may bring the institution's decision on discipline-specific matters before an appeals board. The activities of the appeals board fall under the Danish Public Administration Act, including the stipulations on legal incapacity and the duty of silence.

The appeal should be submitted to the programme director.

The deadline for appeals is two weeks after the examinee has been notified of the decision. The above-mentioned requirements to complaints (being in writing, substantiated etc.) also apply to appeals.

The appeals board is made up of two appointed external examiners who will be appointed by the chairman of the external examiners, one examiner and a student within the same field of study (from the same study programme), both appointed by the programme director.

The appeals board will make a decision based on the material that formed the base of the institution's decision and the appellant's substantiated appeal.

The appeals board will process the appeal, and the decision may concern:

1. an offer of a new assessment (re-assessment) made by new assessors. (Only applicable to written examinations)
2. an offer of a new examination (resit) by new assessors, or
3. a dismissal of the appeal.

If the decision is to offer the appellant a re-assessment or a resit exam, the appellant must be notified that a re-assessment or a resit exam may result in a lower grade. The appellant must accept the offer within 2 weeks of the announcement of the decision. Acceptance of an offer of re-assessment or a resit exam cannot be cancelled.

If the student does not accept the offer within the deadline, re-assessment or a resit exam will not be carried out.

Re-assessment or a resit examination must take place as soon as possible.

On re-assessment, the assessors must be presented with the case documents: The exam paper, the appellant's assignment, the statements made by the original assessors with the comments made by the appellant, and the decision made by the institution.

The appeals board must have made a decision within two months – and within three months for summer exams – after the appeal was made.

The decision of the appeals board is final, meaning that the case cannot be brought before a higher administrative authority regarding the parts of the appeal that concern discipline-specific matters.

Complaints on the grounds of legal matters

Complaints on the grounds of legal matters in decisions made by the assessors in connection with re-assessment or resit exams or the appeals board's decisions may be brought before University College of Northern Denmark within two weeks of the day the complainant was notified of the decision.

Complaints on the grounds of legal matters in decisions that were made by the institution according to the provisions of the Exam Order (e.g. legal incapacity, the hearing procedure, correct interpretation of the Exam Order etc.) may be brought before the educational institution. The educational institution will make a statement and the complainant must be given the opportunity to comment on this statement, the deadline for such comment being usually one week. The institution will forward the complaint, the statement and any comments made by the complainant to the Danish Agency for Higher Education. The institution will submit the complaint, the statement and any comments made by the complainant to the Agency. The deadline for lodging complaints with the institution is two weeks (14 days) from the day the complainant was notified of the decision.

Exemption

The educational institution may grant exemption from those rules in the national section of this Curriculum that were laid down solely by the educational institutions, when exemption is substantiated by exceptional circumstances. The educational institutions co-operate on a uniform exemption practice.

20. Other regulations

Admission requirements, registration, enrolment, leave of absence

In order to enrol on the Automation Engineering programme, you must meet the admission requirements currently in force.

Qualification by way of upper secondary education

Specific admission requirements: physics and mathematics corresponding to Danish C level.

Qualification by way of vocational or technical education

Automation and process control (knowledge of automatic control systems, low voltage, hydraulics and pneumatics based systems, construction and repair of electric and pneumatic motors and circuits).

Data and communications technology (knowledge of IT systems, telecommunications and computer technology).

Electrician, building automation (knowledge of distributed control systems e.g. automatic lighting and heating systems).

Electrician, electrical installation technology (knowledge of installations, repair and maintenance of electrical installations and systems).

Electrician, communications technology (knowledge of installing, programming and configuring data and telecommunications installations etc.)

Electrician, control and regulation technology (knowledge of installation, programming and maintenance of control and regulation technology in automatic facilities including controllable processes driven by electricity, pneumatics or software).

Electrician, electronics and extra low voltage (knowledge of installation and maintenance of electronic equipment and devices such as medical equipment and electric domestic appliances).

Qualification by way of other relevant vocational or technical education

Specific admission requirements: physics and mathematics corresponding to Danish C level.

Other kinds of qualification

Passed qualifying course for application to Danish engineering programmes or similar from your home country.

Enrolment

All students will enrol and be registered for the study programme in Aalborg at University College of Northern Denmark, School of Business and Technology.

All applicants who meet the admission requirements can enrol.

Any doubts about an applicant's entitlement to enrol will be decided by UCN in accordance with the regulations of the Ministerial Order on access, enrolment and leave etc. on certain higher education programmes (Bekendtgørelse om adgang, indskrivning og orlov m.m. ved visse videregående uddannelser)

The student advisor will consider all enquiries about admission and will normally clarify all questions in a talk with the applicant.

Leave of absence

It is possible to take a leave of absence from the study programme. However, it should be noted that students must complete the automation engineering programme not later than 4 years from their commencing the education.

21. Effective date and transition provisions

This institutional section of this Curriculum comes into effect on 15 August 2014 and applies to all students who are and will be registered for the programme and to all examinations commenced on said date or thereafter.

The national section of the curriculum of September 2013 will be repealed as of 15 August 2014. However, any examinations commenced before 1 September 2014 shall be concluded according to this national section of the curriculum not later than 15 August 2014 with the addition of two semesters.

22. Legal basis for the study programme

The programme is governed by the following acts and regulations:

- Ministerial Order no. 1147 of 23 October 2014 on Academy Profession Programmes and Professional Bachelor Programmes. (Bekendtgørelse om erhvervsakademiuddannelser og professionsbacheloruddannelser BEK nr. 1147 af 23/10/2014)
Ministerial Order no.1047 of 30 June 2016 on Academy Profession Programmes and Professional Bachelor Programmes. (Bekendtgørelse om erhvervsakademiuddannelser og professionsbacheloruddannelser BEK nr. 1047 af 30/06/2016)
- Ministerial Order no. 1090 of 25 November 2009 on the Academy Profession Degree Programme in Automation Engineering. (Bekendtgørelse om erhvervsakademiuddannelse inden for automation, BEK nr. 1090 af 25/11/2009)
- Ministerial Order no. 86 of 26 January 2016 on Admission to and Enrolment on Academy Profession and Professional Bachelor's Degree Programmes (Bekendtgørelse om adgang til erhvervsakademiuddannelser og professionsbacheloruddannelser: BEK nr. 86 af 26/01 2016)
- Ministerial Order no. 1046 of 30. June 2016 on examinations on professionally oriented higher education programmes. (Bekendtgørelse om prøver i erhvervsrettede videregående uddannelser: BEK nr. 1046 af 30/06/2016)
(This Order exists in an English translation here: <http://ufm.dk/en/legislation/prevailing-laws-and-regulations/education/academy-profession-study-programmes>)
- Ministerial Order no. 262 of 20 March 2007 on the grading scale and other forms of assessment. (Bekendtgørelse om karakterskala og anden bedømmelse) (in this document referred to as the Grading Order).
- Ministerial Order no. 852 of 3 July 2015 on accreditation of higher education institutions and approval of new higher education programmes. (Bekendtgørelse om akkreditering af videregående uddannelsesinstitutioner og godkendelse af nye videregående uddannelser: BEK nr. 852 af 03/07/2015).
- Consolidation Act no. 777 of 23 June 2016 on open education (business-oriented adult education) etc.
- The Acts and Ministerial Orders are available (in Danish) on the official website for Danish legislation: www.retsinfo.dk