

Academic Regulations for the Electronic Design Engineer Study Programme 2014

Table of contents

Table of contents	1
Introduction	2
Period of validity	2
Admission requirements	2
Objective of the study programme	3
Qualifications and skills	3
Professional title	5
Study programme structure	5
a. Compulsory courses	6
b. Engineering placement	6
c. Specialisation based on electives and projects	6
d. Bachelor Project	6
e. Electronic workshop course	7
Business engineer	7
Teaching structure	7
Academic progression	8
Types of examinations and assessment	8
Deadlines	9
Requirements for passing the study programme	10
Internationalisation	10
Credit transfer	11
Exemptions	11
Further education	11
Transitional regulations	11
List of documents referred to in the current academic regulations	12
Regulatory framework	12
Engineering placement	12
Course catalogue	12
Application procedure for specialisation	12
Bachelor Project	12
Appendix 1: Overview of the Electronic Design Engineer study programme	13

Introduction

The current academic regulations have been prepared in accordance with the Danish Ministry of Science, Innovation and Higher Education's Ministerial Order No. 527 of 21 June 2002 on the Bachelor of Engineering study programme.

Aarhus University, School of Engineering offers a study programme in Electronic Engineering (in Danish), and Aarhus University, Herning offers a study programme in Electronic Design Engineering (in English). Both study programmes are based on the same regulatory framework, but due to the difference in language instruction as well as geographical location, there will be slight deviations. As a result, two academic regulations have been prepared.

The study programme in Electronic Engineering is available [here](#) (in Danish).

The current academic regulations describe how the study programme in Electronic Design Engineering at Aarhus University, Herning is composed. The academic regulations have been prepared in accordance with rules established by law or ministerial orders, or rules established by Aarhus University, School of Engineering.

Course descriptions for each course at the Electronic Design Engineer study programme are available in the [online course catalogue](#).

Period of validity

The academic regulations were approved by the Board of Studies, Aarhus School of Engineering in August 2012. They apply to students who begin their studies in August 2012 or later.

Admission requirements

Admission to the Bachelor of Engineering study programme requires an upper secondary school examination (equivalent to 12 years of school, e.g. *HTX*, *HF*, *STX*, *EUX* and admission course).

In the qualifying examination, the applicant must have passed mathematics at 'A'-level (minimum 375 hours of instruction), physics at 'B'-level (minimum 200 hours of instruction) and chemistry at 'C'-level (minimum 75 hours of instruction). The applicant must have achieved a minimum of 02 in weighed average of the concluding term marks and examination marks in all three subjects.

If the qualifying examination has been passed according to the Danish 13-step scale, the concluding term marks and examination marks must be 6.

The applicant may be eligible for admission if s/he holds a degree that has provided the skills corresponding to the above levels.

Non-Danish degrees are assessed on an individual basis, and, if possible, conversion of marks is made.

Objective of the study programme

The objective of the Bachelor of Engineering in Electronic Design, cf. the Ministerial Order, is to qualify the student to perform professional tasks nationally and internationally. They must be able to:

- translate technical research results as well as scientific and technical knowledge into practical applications in development assignments and in solving technical problems
- critically acquire new knowledge within relevant engineering fields
- solve commonly occurring engineering tasks independently
- plan, realise and manage technical and technological systems, taking into account societal, economic, environmental as well as occupational safety and health-related aspects when solving technical problems
- enter into cooperative and management functions and contexts at a professional level with people who have various educational, linguistic and cultural backgrounds.

The study programme is incorporated into the development environments at Aarhus University. Thus, the programme qualifies for participation in the operation and development of the engineering profession as well as for further education at master level, e.g. a Master of Science in Engineering.

Qualifications and skills

To reach the overall objective, the student must acquire:

- theoretical qualifications
- basic academic and professional qualifications and skills
- specific professional qualifications and skills as well as general engineering skills

Theoretical qualifications:

During the course of study, the student must acquire theoretical knowledge within basic theoretical subjects such as mathematics, physics, electronics and computer science, thereby obtaining more specific professional qualifications and prerequisites for further education.

Basic professional qualifications and skills:

The student must, primarily during the first four semesters of the study programme, acquire basic professional qualifications and skills in the following key areas:

- *Electrical, electronic and optical components*
- *Basic circuit analysis*
- *Electronic building blocks*
- *Mathematics and signal processing*
- *Programming methods and programming languages*
- *Computer architecture*

Specific professional qualifications and skills:

The student must, primarily during the last three to four semesters, acquire specific professional qualifications and skills within one or more relevant academic areas.

General engineering skills:

During the course of study, the student must acquire skills in order to critically, efficiently and methodologically:

- solve commonly occurring engineering tasks independently, including translating technical research results as well as scientific and technical knowledge into practical applications in development assignments and in solving technical problems
- seek, acquire and relate to new knowledge
- enter into cooperative and management functions and contexts at a professional level with people who have various educational, linguistic and cultural backgrounds
- be able to plan and prioritise tasks, plan and manage meetings as well as qualify assure the work performed on the basis of established objectives
- outline and analyse technical problems based on narrow technical criteria as well as a wide societal and scientific perspective
- work with problem solving and relate to the achieved results based on established prerequisites, assumptions and simplifications in the method applied
- communicate – both orally and in writing – technical problems, analyses and results, including preparing simple and legible reports, drawings and descriptions taking into consideration the receiver's background
- use common IT tools, including calculation programmes, for the problem-solving process and presentation.

Job functions

The Bachelor of Engineering aims to qualify graduates to carry out various tasks from development of mass-produced electronics to design of high-technology specialised equipment.

The study programme will qualify the graduate to work in a private or public company and carry out tasks such as:

- Development of electronics or other data-technical or electrical engineering solutions for devices and systems
- Project management when developing or operating electrical engineering devices and systems
- Counselling when introducing or purchasing electrical engineering devices and systems
- Maintenance or sale of electrical engineering devices and systems
- Other tasks in connection with electrical engineering devices and systems.

Professional title

Graduates are entitled to use the title (in Danish): *Diplomingeniør* with the specification *Electronic Design Engineer*.

In English:

Bachelor of Engineering

with the specification *Electronic Design Engineer*.

Graduates who have completed electives, projects and the Bachelor Project within the same subject area may take the title of Bachelor of Engineering with a specialisation.

The specialisation title is agreed upon with the degree programme coordinator, cf. “Application procedure for specialisation in Electronic Engineering/Electronic Design Engineering”.

Study programme structure

The duration of the study programme is 3½ years full-time study, corresponding to a teaching load of 210 ECTS credits. 1 ECTS credit corresponds to 27 hours of study activity for a student.

The study programme consists of the following elements:

- a. Compulsory courses
- b. Engineering placement

- c. Specialisation based on electives and projects
- d. Bachelor Project
- e. Electronic workshop course

a. Compulsory courses

The study programme consists of compulsory courses and projects corresponding to 75-150 ECTS credits. The contents of the compulsory courses and projects include basic knowledge and skills characterising the engineering education.

b. Engineering placement

The engineering placement is an integrated part of the Bachelor of Engineering study programme. The duration of the engineering placement is five months, corresponding to 30 ECTS credits. The engineering placement is described further in the course description (see [Aarhus University's course catalogue](#)) and the contract form is available on the [Student Portal](#).

c. Specialisation based on electives and projects

The study programme provides the opportunity for students to choose a specialisation based on a number of electives. The specific electives in electronics can be found in the online course catalogue. The subject element includes elective courses and projects corresponding to 15-90 ECTS credits. The student can choose a maximum of 10 ECTS credits among courses without a predominantly mathematical-scientific or technical-engineering focus (business courses).

d. Bachelor Project

The Bachelor of Engineering in Electronic Design is completed with a bachelor project of 25 ECTS credits.

The Bachelor Project is usually based on a problem from the engineering profession, but it may also deal with a concrete sub-problem from a development project.

The idea of the Bachelor Project is to give the student an opportunity to apply the acquired knowledge independently in a larger project. The student must demonstrate the ability to apply engineering theories and methods within a specified subject as well as explain the results in a logical and coherent manner in both written and oral form.

e. Electronic workshop course

For students without relevant practical prerequisites, the study programme includes a five week workshop course. The purpose of the workshop course is to provide an understanding of electronic components and how electronic systems are built.

Business engineer

As part of the Bachelor of Engineering, 7th semester students have the opportunity to continue their studies with the specialisation 'Business Engineer' immediately after graduation (as an 8th semester). The specialisation adds 30 ECTS credits to the Bachelor of Engineering (i.e. a total of 240 ECTS credits). [For more information, see the academic regulations for the Business Engineer specialisation \(in Danish\).](#)

Teaching structure

The following teaching and working methods are used. Most often, it will be a combination of two or more of these:

Courses

The aim of a course is to provide the student with qualifications within a specific subject area. However, other academic elements may also be part of the course in order to ensure that the student obtains a general understanding of the course, including how each course is integrated.

Assignments

Assignments may vary from solving small problems to larger assignments used as a basis for approval or admission to an examination.

Projects

Projects include both academic activities and activities supporting learning, management and participation in project work as well as any other personal qualities.

The Bachelor Project

The Bachelor Project is prepared before 7th semester, cf. the study overview.

Electronic workshop course

Students who are admitted to the Bachelor of Engineering study programme without a relevant vocational education must attend a five week electronic workshop course during the study. This ensures that the students have the necessary practical skills in order to benefit as much as possible from the theoretical study.

Academic progression

Courses may occur progressively which means that qualifications in one or more subjects are obtained (and possibly required) through participation in specific courses in a predefined sequence.

Types of examinations and assessment

Examinations are used to continuously assess whether the student has achieved a satisfactory level of professional competencies within one or more courses or projects. When the student is enrolled in a course, s/he is automatically registered for the examination. In the detailed overview of the study programme (see Appendix 2), each course is described in terms of type of examination/assessment method, reexamination (second examination attempt) and assessment.

The following assessment methods are used:

- Written examination
- Oral examination
- Project examination

– Or a combination/combinations of these.

The assessment may be:

- One mark according to the Danish 7-step scale
- Passed/not passed
- Approved/not approved

To pass a subject, the student must obtain a mark of at least 02 or above or “passed”.

The following types of examination are used:

Ordinary examination

For students who have participated in the teaching. The examination takes place shortly following the teaching period. The student is automatically registered for this examination.

Reexamination (registration for a reexamination)

For students, who have used an attempt, but failed the previous ordinary examination. The student is automatically registered for this examination, with the exception of project examinations.

Make-up examination (reexamination due to illness)

For students who can document illness during an ordinary examination or reexamination.

Reexamination (complaints)

A reexamination following a complaint may be granted by Aarhus University, School of Engineering.

Registration for a reexamination

The possibility, if any, to register for a reexamination or resubmitting assignments for assessment is specified in the course descriptions (see the [course catalogue](#)).

Rules for attending classes and examinations

- General requirements:
 - Some courses may require other courses as prerequisites (stated in the course descriptions under 'Prerequisites'). A student is not allowed to attend the teaching or an examination in a course where prerequisite courses, if any, have not been passed.
- Specific requirements for each semester:
 - 1st semester: Current admission requirements
 - Engineering placement: The student must have passed 1st to 4th semester before a contract can be made
 - Bachelor Project: 1st to 5th semester must be passed.
- Exemptions:
 - If a student does not meet the above requirements, an exemption may be granted, describing the specific courses that the student must attend to graduate.

Marking

The evaluation is assessed by:

1. Examiner(s) only (internal)
2. Examiner(s) and an external examiner (external)

The examiner(s) is (are) typically the lecturer(s) associated with the course. An external examiner is a member of a corps of external examiners which has been approved by the Danish Ministry of Science, Innovation and Higher Education.

Deadlines

The following deadlines apply to complete the Electronic Design Engineer study programme:

- Before the end of the second year of study, all 1st semester courses must be passed
- To be actively studying, the student must attend at least one examination within 12 months
- The entire education must be completed within seven years after admission to the study programme.

If the above-mentioned deadlines are not met, the student is terminated from registration at Aarhus University. However, in special circumstances, Aarhus University, School of Engineering may grant exemption from the deadlines.

For more information, see the [Student Portal](#).

Requirements for passing the study programme

The Bachelor of Engineering study programme is passed when the student has completed and passed courses, project and placement (cf. the paragraph on [Study programme structure](#)), corresponding to at least 210 ECTS credits.

A student has three attempts to pass a course.

Internationalisation

The engineering placement, courses and the Bachelor Project may, after approval by the degree programme coordinator, take place in foreign companies or at engineering-relevant institutions.

Studying abroad must not prolong the period of study. In addition, the student must choose courses that, as regards to content, have not already been passed.

Students studying abroad are evaluated at the foreign institution. It is the student's responsibility to document that the course at the foreign institution is passed.

Exchange students

Incoming exchange students must fill in an online application form as well as a Learning Agreement confirming that the proposed programme of study at Aarhus University, School of Engineering can be approved by the sending institution as part of the education.

In order to attend a course in English, the following must be documented:

- Academic level (minimum two years of study at an equivalent study programme)
- English proficiency (TOEFL test with a minimum score of 550 or equivalent)
- Preliminary approval from the sending institution
- Completion of minimum one semester in English in order to be approved to register for the Bachelor Project.

Credit transfer

On the basis of concrete, individual applications, the Board of Studies may approve credit transfer for parts of the study programme. Courses passed at another educational institution may replace a concrete course at Aarhus University, School of Engineering. Apply for credit for a course [here](#).

Students with relevant engineering work experience may be granted credit transfer for the engineering placement by Aarhus University, School of Engineering.

In accordance with the Ministerial Order No. 527 of 21 June 2002, section 22, courses passed at other educational institutions may be eligible for credit transfer as part of the study programme.

Formal admission requirements must be fulfilled:

An upper secondary school, including mathematics at A-level, physics at B-level and chemistry at C-level.

Exemptions

Under special circumstances, the Board of Studies may exempt from the rules in the academic regulations provided that it does not conflict with the Danish Ministry of Science, Innovation and Higher Education's ministerial orders. For more information, see the [Student Portal](#).

Further education

The Bachelor of Engineering provides the opportunity to acquire a Master of Science in Engineering. Read more about the admission requirements [here](#).

Transitional regulations

Students enrolled in previous academic regulations are transferred to the current academic regulations based on an individual assessment of credit transfer.

List of documents referred to in the current academic regulations

Regulatory framework

The Bachelor of Engineering study programme is governed by the following ministerial orders (in Danish):

- [Ministerial Order No. 527 of 21 June 2002 on the Bachelor of Engineering](#)
- [Ministerial Order No. 214 of 21 February 2012 on Admission, Registration and Absence of Leave](#)
- [Ministerial Order No. 262 on the Grading Scale and Other Forms of Assessment](#)
- [Ministerial Order No. 684 of 7 June 2008 on i.a. Approval of the Professional Bachelor Study Programme](#)
- [Ministerial Order No. 1519 of 16 December 2013 on Tests and Examinations in Professionally-oriented Higher Education Programmes](#)

Rules and regulations for students (see Blackboard and the Student Portal)

On the Student Portal, students can find information about the rules laid down in the ministerial order as well as guidelines on examinations, etc.

Engineering placement

The engineering placement is described further in the course description (available in the course catalogue) and the contract form is available on the [Student Portal](#).

Course catalogue

The course catalogue provides descriptions of courses offered at Aarhus University, including contents, criteria for achieving objectives and type of examination, etc. For a list of the courses offered at Aarhus University, School of Engineering, click [here](#) (in Danish).

Appendix 1 contains a list of the courses in each semester.

Application procedure for specialisation

Bachelor Project

See the course description for more information about the Bachelor Project).

Appendix 1: Overview of the Electronic Design Engineer study programme

1st semester	2nd semester	3rd semester	4th semester	5th semester	6th semester	7th semester
PRO1 Project 1 5 ECTS Internal marking	PRO2 Project 2 5 ECTS Internal marking	PRO3 Project 3 5 ECTS Internal marking	PRO4 Project 4 5 ECTS Internal marking	PRO5 Project 5 (company project) 10 ECTS External marking	PLA1 Placement 30 ECTS	Bachelor Project 25 ECTS External marking
BSD1 Basic Software Development 1 5 ECTS Internal marking	BSD2 Basic Software Development 2 5 ECTS External marking	ESY1 Embedded Systems 1 <i>Systems engineering</i> <i>Low- and high-level software design</i> 10 ECTS Internal marking	ESY2 Embedded Systems 2 <i>Digital hardware design</i> <i>Device drivers</i> 10 ECTS External marking			
DEL1 Digital Electronics 1 5 ECTS Internal examiner	DEL2 Digital Electronics 2 5 ECTS Internal marking	ANA2 Analogue Electronics 2 5 ECTS External marking	DSE1 Dynamic Systems and EMC 1 5 ECTS External marking	Elective 5 ECTS Internal/external marking (see course description)		
ECA1 Electric Circuit Analysis 1 5 ECTS Internal marking	ANA1 Analogue Electronics 1 5 ECTS Internal marking	SWE1 Software Engineering 1 5 ECTS External marking	IDES1 Interaction Design for Embedded Systems 1 5 ECTS External marking	Elective 5 ECTS Internal/external marking (see course description)		
APS1 Applied Science 1 <i>Mathematics</i> <i>Physics</i> 10 ECTS Internal marking	APS2 Applied Science 2 <i>Mathematics</i> <i>Circuit analysis</i> <i>Physics</i> 10 ECTS External marking	DSP1 Digital Signal Processing 1 5 ECTS Internal marking	DSP2 Digital Signal Processing 2 5 ECTS External marking	TOS1 Theory of Science 1 5 ECTS Internal marking		