AALBORG UNIVERSITET

CURRICULUM FOR THE BACHELOR OF SCIENCE (BSC) PROGRAMME IN ELECTRONICS AND COMPUTER ENGINEERING 2014

BACHELOR OF SCIENCE (BSC) IN ENGINEERING
ESBJERG

Curriculum for the Bachelor of Science (BSc) Programme in Electronics and Computer Engineering 2014

Link to this studyline

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§ 1: PREFACE

Pursuant to Act 367 of May 22, 2013 on Universities (the University Act) with subsequent changes, the following curriculum for the Bachelor's programme in Electronics and Computer Engineering is established. The programme also follows the Joint Programme Regulations and the Examination Policies and Procedures for the Faculty of Engineering and Science.

§ 2: BASIS IN MINISTERIAL ORDERS

The Bachelor's programme is organised in accordance with the Ministry of Science, Innovation and Higher Education's Order no. 814 of June 29, 2010 on Bachelor's and Master's Programmes at Universities (the Ministerial Order of the Study Programmes) and Ministerial Order no. 666 of June 24, 2012 on University Examinations (the Examination Order) with subsequent changes. Further reference is made to Ministerial Order no. 1487 of December 16, 2013 (the Admission Order) and Ministerial Order no. 250 of March 15, 2007 (the Grading Scale Order) with subsequent changes.

§ 3: CAMPUS

The programme is offered in Esbjerg.

§ 4: FACULTY AFFILIATION

The Bachelor's programme falls under the The Faculty of Engineering and Science, Aalborg University.

§ 5: STUDY BOARD AFFILIATION

The Bachelor's programme falls under the Study Board of Study Board of Build, Energy, Electronics and Mechanics in Esbjerg

§ 6: AFFILIATION TO CORPS OF EXTERNAL EXAMINERS

The Bachelor's programme is affiliated to the nationwide engineering examiners corps: Ingeniøruddannelsernes landsdækkende censorkorps.

§ 7: ADMISSION REQUIREMENTS

Admission to the Bachelor's programme in Electronics and Computer Engineering requires an upper secondary education.

The programme's specific requirements are: English B, Mathematics A and Physics B or Geoscience A according to admission notice. All subjects must be passed.

§ 8: THE PROGRAMME TITLE IN DANISH AND ENGLISH

The Bachelor's programme entitles the graduate to the Danish designation: Bachelor (BSc) i teknisk videnskab (elektronik og datateknik). The English designation is: Bachelor of Science (BSc) in Engineering (Electronics and Computer Engineering).

§ 9: PROGRAMME SPECIFICATIONS IN ECTS CREDITS

The Bachelor's programme is a 3-year, research-based, full-time study programme. The programme is set to 180 ECTS credits.

§ 10: RULES CONCERNING CREDIT TRANSFER (MERIT), INCLUDING THE POSSIBILITY FOR CHOICE OF MODULES THAT ARE PART OF ANOTHER PROGRAMME AT A UNIVERSITY IN DENMARK OR ABROAD

The Study Board can approve that passed programme elements from other educational programmes at the same level replaces programme elements within this programme (credit transfer).

Furthermore, the Study Board can, upon application, approve that parts of this programme is completed at another university or a further education institution in Denmark or abroad (pre-approval of credit transfer).

The Study Board's decisions regarding credit transfer are based on an academic assessment.

§ 11: EXEMPTIONS

The Study Board's possibilities to grant exemption, including exemption to further examination attempts and special examination conditions, are stated in the Examination Policies and Procedures published at this website: https://www.studieservice.aau.dk/regler-vejledninger

§ 12: RULES FOR EXAMINATIONS

The rules for examinations are stated in the Examination Policies and Procedures published at this website: https://www.studieservice.aau.dk/regler-vejledninger

§ 13: RULES CONCERNING WRITTEN WORK, INCLUDING THE BACHELOR'S PROJECT

In the assessment of all written work, regardless of the language it is written in, weight is also given to the student's formulation and spelling ability, in addition to the academic content. Orthographic and grammatical correctness as well as stylistic proficiency are taken as a basis for the evaluation of language performance. Language performance must always be included as an independent dimension of the total evaluation. However, no examination can be assessed as 'Pass' on the basis of good language performance alone; similarly, an examination normally cannot be assessed as 'Fail' on the basis of poor language performance alone.

The Study Board can grant exemption from this in special cases (e.g., dyslexia or a native language other than Danish).

The Bachelor's project must include an English summary. If the project is written in English, the summary can be in Danish. The summary is included in the evaluation of the project as a whole.

§ 14: REQUIREMENTS REGARDING THE READING OF TEXTS IN A FOREIGN LANGUAGE

It is assumed that the student can read academic texts in his or her native language as well as in English and use reference works etc. in other European languages.

§ 15: COMPETENCE PROFILE ON THE DIPLOMA

The following competence profile will appear on the diploma:

A graduate of the Bachelor's programme has competencies acquired through an educational programme that has taken place in a research environment.

A graduate of the Bachelor's programme has fundamental knowledge of and insight into his/her subject's methods and scientific foundation. These properties qualify the graduate of the Bachelor's programme for further education in a relevant Master's programme as well as for employment on the basis of the educational programme

§ 16: COMPETENCE PROFILE OF THE PROGRAMME

The graduate of the Bachelor's programme:

Knowledge

- Has knowledge of and insight into fundamental theories, methods and practical subjects within the field of Electronics and Computer Engineering
- Is able to understand and reflect upon theories, methods and practical subjects within the field
- Has a firm grasp of the mathematical and programming foundations of the field
- Can analyse, design, implement, test and document micro-processor-based systems
- Has knowledge of the interaction between electronic and physical systems, including feedback mechanisms, electronic circuits, automation and control systems, and signal processing
- Has insight into techniques and methods for real-time acquisition, storage and processing of complex information
- Has insight into analysis, design and test methods for feedback control and digital signal processing

Skills

- Can utilize up-to-date scientific methods, tools and techniques to analyse and solve complex problems in the field of Electronics and Computer Engineering
- Can evaluate and compare theoretical and practical problems, as well as describe and select relevant solution strategies
- Is able to implement such solution strategies and evaluate them in a systematic manner
- Is able to present problems and solution strategies within the field of Electronics and Computer Engineering, in writing as well as orally, to specialists as well as non-specialists, including external parties, users, etc.

Competences

- Is able to handle complex situations that arise in research and/or development-related environments, such as university studies and/or engineering workplaces
- Is able to develop and test hardware and software for embedded systems in a broad systems-oriented context
- Can work independently as well as in collaboration with others, both within and across technical fields, in an efficient and professional manner
- Is able to identify his/her own learning needs and structure his/her own learning in various learning environments

§ 17: STRUCTURE AND CONTENTS OF THE PROGRAMME

The programme is structured in modules and organised as a problem-based study. A module is a programme element or a group of programme elements, which aims to give students a set of professional skills within a fixed time frame specified in ECTS credits, and concluding with one or more examinations within specific exam periods. The examinations are defined in the curriculum.

The programme is based on a combination of academic, problem-oriented and interdisciplinary approaches and organised based on the following work and evaluation methods that combine skills and reflection:

- lectures
- classroom instruction
- project work
- work shops
- exercises (individually and in groups)
- teacher feedback
- reflection
- portfolio work

Rules concerning the progress of the Bachelor’s programme

The student must participate in all first year examinations by the end of the first year of study in the Bachelor's programme, in order to be able to continue the programme. The first year of study must be passed by the end of the second year of study, in order that the student can continue his/her Bachelor's programme.

In special cases, however, there may be exemption from the above if the student has been on a leave of absence. Leave is granted during first year of study only in the event of maternity, adoption, military service, UN service or where there are exceptional circumstances.

Rules concerning the completion of the Bachelor’s programme

The Bachelor’s programme must be completed no later than six years after it was begun.

§ 18: OVERVIEW OF THE PROGRAMME

All modules are assessed through individual grading according to the 7-point grading scale or Passed/Not passed. All modules are assessed by external assessment (an external examiner) or by internal assessment (an additional examiner or no additional examiner).

Offered as: 1-professional						
Module name	Course type	ECTS	Applied grading scale	Evaluation method	Assessment method	Language
1 SEMESTER						
Technological Project Work	Project	5	Passed/Not Passed	Internal examination	Oral exam based on a project	English
Monitoring & Programming	Project	10	7-point grading scale	Internal examination	Oral exam based on a project	English
Imperative Programming	Course	5	Passed/Not Passed	Internal examination	Written and oral exam	English
Problem-based Learning in Science, Technology and Society	Course	5	Passed/Not Passed	Internal examination	Written exam	Danish and English
Calculus	Course	5	7-point grading scale	Internal examination	Written or oral exam	Danish and English
2 SEMESTER						
Analog Instrumentation	Project	15	7-point grading scale	External examination	Oral exam based on a project	English
Linear Algebra	Course	5	7-point grading scale	Internal examination	Written or oral exam	Danish and English
Basic Electrical Engineering	Course	5	7-point grading scale	Internal examination	Written exam	English
Digital Design & Sensors	Course	5	Passed/Not Passed	Internal examination	Written or oral exam	English
3 SEMESTER						
Micro Processor Based Systems	Project	15	7-point grading scale	External examination	Oral exam based on a project	English
AC-Circuits & Electro Physics	Course	5	7-point grading scale	Internal examination	Written or oral exam	English
Advanced Calculus	Course	5	7-point grading scale	Internal examination	Written exam	English
Micro Processors & Programming	Course	5	Passed/Not Passed	Internal examination	Written or oral exam	English
4 SEMESTER						
Control Engineering	Project	15	7-point grading scale	Internal examination	Oral exam based on a project	English
Modelling and Simulation	Course	5	7-point grading scale	Internal examination	Written or oral exam	English
Control Theory	Course	5	7-point grading scale	Internal examination	Written or oral exam	English
Power Electronics and Networks	Course	5	7-point grading scale	Internal examination	Written and oral exam	English
5 SEMESTER						
Elective Projects 5th Semester One project must be chosen	Project	15				
Numerical Methods	Course	5	7-point grading scale	Internal examination	Oral exam	English

Signal Processing	Course	5	Passed/Not Passed	Internal examination	Written or oral exam	English
Real-time Embedded Systems	Course	5	Passed/Not Passed	Internal examination	Written or oral exam	English
6 SEMESTER						
Elective Projects 6th Semester One project must be chosen	Project	20				
Introduction to Probability Theory and Statistics	Course	5	Passed/Not Passed	Internal examination	Written or oral exam	English
Matrix Computation and Convex Optimization	Course	5	Passed/Not Passed	Internal examination	Written or oral exam	English

Elective Projects 5th Semester One project must be chosen						
Module name	Course type	ECTS	Applied grading scale	Evaluation Method	Assessment method	Language
Automation	Project	15	7-point grading scale	External examination	Oral exam based on a project	English
Digital Filtering	Project	15	7-point grading scale	External examination	Oral exam based on a project	English

Elective Projects 6th Semester One project must be chosen						
Module name	Course type	ECTS	Applied grading scale	Evaluation Method	Assessment method	Language
BSc Project (Automation and Control)	Project	20	7-point grading scale	External examination	Oral exam based on a project	English
BSc Project (Embedded Real-Time Signal Processing)	Project	20	7-point grading scale	External examination	Oral exam based on a project	English

Throughout the semesters students will at an increasing abstraction level be introduced to relevant theories and scientific methods. Scientific theory and scientific methods in general are included in the course Problem based learning in science, technology and society. Moreover, the students develop their skills in this area in their project work, where they will apply scientific methods in practice and reflect on their application.

Special project process

In the 3rd, 4th and 5th semesters, the student can upon application, design an educational programme where the project work is replaced by other study activities; cf. the Framework Provisions section 9.3.1

§ 19: ADDITIONAL INFORMATION

The current version of the study curriculum is published on the Aalborg University website for study curricula.

§ 20: COMMENCEMENT AND TRANSITIONAL RULES

The curriculum is approved by the Dean of the Faculty of Engineeering and Science and enters into force as of 1 September 2014.

Students who wish to complete their studies under the previous curriculum from 2011 must conclude their education by the summer examination period 2016 at the latest, since examinations under the previous curriculum are not offered after this time.

In accordance with the Joint Programme Regulations of the Faculty of Engineering and Science at Aalborg University, the curriculum must be revised no later than 5 years after its entry into force.

§ 21: AMENDMENTS TO THE CURRICULUM AND REGULATIONS

Minor editorial changes have been made in connection with the digitisation of the study curriculum.

Version 2 September 2017: Geoscience A has been added in § 7.