Curriculum for the Bachelor Programme in Engineering in Information and Communication Technology

Applies to students who commenced studies in February 2017 or later

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Introduction

This curriculum applies to students who commenced studies in February 2017 or later.

The curriculum has been prepared in accordance with:
- Executive Order no. 1160 of 7 September 2016 on the Bachelor Programme in Engineering (Bekendtgørelse om diplomingeniøruddannelsen)
- Executive order no. 1064 of 30 June 2016 on tests in professionally-oriented programmes (Bekendtgørelse om prøver i erhvervsrettede videregående uddannelser)
- Executive Order no. 114 of 3 February 2015 on the Marking Scale and Other Forms of Assessment (Bekendtgørelse om karakterskala og anden bedømmelse)

Admission requirements for the programme:
A-level Mathematics, B-level Physics, B-level English
1) upper-secondary leaving exam or
2) qualifying exam for engineering studies

In case of discrepancies between the executive orders in force at any time and this curriculum, the executive orders shall take precedence.

Students are personally responsible for understanding the contents of this curriculum, which is accessible on the VIA University College website.

1 Objectives of the Programme

VIA Information and Communication Technology, Bachelor of Engineering (ICT), is a complete course of study that, in accordance with Chapter 1 of Executive Order no. 1160, qualifies students for national as well as international business functions in which they:
1) Implement technical research results as well as knowledge from information technology engineering and the natural sciences in practice through IT development assignments and by solving IT related problems.

2) Critically acquire new knowledge within relevant areas of information technology engineering.

3) Carry out various ICT Engineering related tasks on an independent basis.

4) Plan, realize and manage technical installations using information technology, including being able to take into account the social, financial, environmental and working environmental consequences of their solution.

5) Participate in management and collaborative situations with people from different educational and cultural backgrounds.

6) Become qualified to participate in further studies.

The ICT Programme at VIA University College is a vocational oriented course of study with emphasis on giving students the skills to act upon graduation as project managers with the ability to obtain an overview of new problem areas, describe these and realize solutions, both nationally and internationally.

The ICT Programme aims to be the integrating level between software development as seen in business and web solutions, and more traditional disciplines like electronics or data science. The main elements in the programme are illustrated in the diagram below:
The goal is to educate ICT Engineers and give them comprehensive insight into software, hardware and technological development as well as to ensure that they can communicate and work with other stakeholders in the industry.

ICT Engineers typically find employment in software houses, automation companies, large and medium-sized companies such as Software Engineers, R&D Managers, Software Developers and Solutions Architects.

The objectives of the programme are primarily achieved through:

- Interaction between theory and practice with focus on application-oriented and practical engineering work. Through the project work, there is also an emphasis on developing the student’s professional, methodological, communicative and personal skills.

- Collaboration with businesses and research environments in connection with the development and educational activities.

- Providing an international study environment, with all courses offered and taught in English for Danish and international students, with the possibility to carry out parts of the programme abroad.

- Active utilisation of the student’s internship as a means of exchanging knowledge and experience between the university college and the industry.

2 Programme structure and content

2.1 General information on programme structure and content

New students are admitted in August and February.

The programme requires 3½ years of full-time study and is divided into seven semesters, acquiring 210 ECTS points.¹

The programme includes:

- Compulsory courses and projects
- Compulsory workshops
- Specialisation courses
- Elective courses
- Internship
- A bachelor project

¹ ECTS (European Credit Transfer System)
To achieve the diploma of the programme the student must pass exams with a total of 210 ECTS points, have passed all compulsory elements of the programme, and must have been in internship.

The course of study is illustrated in the following table:

<table>
<thead>
<tr>
<th>Semester</th>
<th>Elective course</th>
<th>Compulsory specialisation course</th>
<th>Bachelor project within specialisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>7th semester</td>
<td>5 ECTS</td>
<td>5 ECTS</td>
<td>20 ECTS</td>
</tr>
<tr>
<td>6th semester</td>
<td>Compulsory joint courses 10 ECTS</td>
<td>Elective courses 15 ECTS</td>
<td>Compulsory specialisation course 5 ECTS</td>
</tr>
<tr>
<td>5th semester</td>
<td>Internship 30 ECTS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4th semester</td>
<td>Compulsory joint courses 15 ECTS</td>
<td>Compulsory specialisation courses 10 ECTS</td>
<td>Project within specialisation 5 ECTS</td>
</tr>
<tr>
<td>3rd semester</td>
<td>Compulsory joint courses 15 ECTS</td>
<td>Compulsory specialisation courses 10 ECTS</td>
<td>Project 5 ECTS</td>
</tr>
<tr>
<td>2nd semester</td>
<td>Compulsory joint courses 25 ECTS</td>
<td></td>
<td>Project 5 ECTS</td>
</tr>
<tr>
<td>1st semester</td>
<td>Compulsory joint courses 25 ECTS</td>
<td></td>
<td>Project 5 ECTS</td>
</tr>
</tbody>
</table>

Courses are offered in a relevant order, which means that some courses must be passed in order for the student to attend subsequent courses.

Courses have a scope of between 5 and 10 ECTS points, and projects have a scope of between 5 and 20 ECTS points. See appendix 1: Study plan. Students are only allowed to attend courses and projects summing up to maximum 35 ECTS per semester.

For each course or project, a description has been prepared with information on purpose, topics, prerequisites, assessment criteria, etc., which is available on the VIA University College website. Project guidelines have also been prepared along with course descriptions for the projects.
2.1.1 First semester
The aim of the 1st semester is to give the student profound knowledge and practical skills in object oriented programming and system development. Furthermore, the students learn about responsive web design, and they become familiar with the way of studying individually and in intercultural groups.

The semester is organised as a number of introductory courses and a semester project in which the students work in groups. The purpose of the semester project is to design, implement and document a single user software system given as a case scenario.

2.1.2 Second semester
The purpose of the 2nd semester is to gain an understanding of computer networking, database development and system development methods as well as to achieve programming skills to build client/server systems. From an educational perspective, the students learn to take more responsibility for their own education.

The semester is organised as a number of compulsory courses and a semester project in which the students work in groups. The purpose of the semester project is to develop a client/server system including documentation of the system and the development process.

2.1.3 Third and Fourth semester
The purpose of the compulsory courses on the 3rd and 4th semesters is to understand distributed systems in order to implement them. Other topics include basic computer architecture, algorithms and advanced data structures in C# programming language, and the .net platform. The semesters also include a course in engineering science and business which deals with how engineers work, the methods of engineering science, and the role of the engineer in society and business.

On the third semester, the student begins on one of the following specialisations:

- Cross Media
- Data Engineering
- Embedded Engineering

In the Cross Media specialisation, the students work on and with Mobile Applications and Serious Games which involves Unity, asset store, modelling and simulation as well as interfacing.

In the Data Engineering specialisation, emphasis is on Data Warehousing and Master Data Management. The specialization also focusses on Enterprise Resource Planning (ERP), business intelligence, data visualisation and analytics.

For the Embedded specialisation, focus is on basic electronics which will be prerequisites for Real-Time Programming. This involves understanding central concepts and characteristics about real-time and embedded programming, and to have knowledge about electronics used to interface micro-controllers to a number of sensors and actuators.

During the third semester the students work on a cross disciplinary project. At the end of the fourth semester, the students work on a project within their specialisation. Since
this project is the last semester project before the bachelor project, the students are expected to work more independently than on the previous semesters.

2.1.4 Fifth semester
In the fifth semester, the internship takes place, where the student gains insight into how engineering tasks are carried out in practice, including:
- gains experience in how the studied theory can be applied in practice
- develops good working habits and interpersonal skills
- strengthens analytical and creative skills in solving a given task
- develops a holistic sense through direct involvement in engineering assignments
- documents own experience and data in a structured manner.

See section 2.4 for more information.

2.1.5 Sixth semester
In the sixth semester, the student will have a course in programming paradigms, continue in the chosen specialisation, and attend elective courses. Furthermore, the student will begin bachelor project preparations.

2.1.6 Seventh semester
The seventh semester includes one or two elective courses and the bachelor project.

The purpose of the bachelor project is to evolve the student’s ability to solve a relevant ICT Engineering problem and document the solution. The bachelor project is typically a real life project made for a company and is made in groups of two or three students.

2.2 Compulsory courses and semester projects
The compulsory courses are conducted in semesters 1-4 and 6 of the programme. Class attendance in these courses is compulsory when required in the course descriptions.

Semesters 1-2 and 4 include a semester project with a scope of 5 ECTS points. During the third semester, the students work on a cross disciplinary project counting 5 ECTS points. The primary objective of the semester projects is to link the courses taught during that semester together to form a whole.

2.3 Compulsory workshops
Up to five compulsory workshop courses are incorporated into the programme. The workshop courses are of one week’s duration and are carried out during non-teaching study breaks or as an integrated part of and parallel to a compulsory course. They must be completed before commencing the internship.

Based on attendance, the workshop courses are assessed as approved/not approved and do not award any ECTS credits.

2.4 Internship
The internship covers one semester and awards 30 ECTS points. It takes place in the 5th semester in either the private or public sector in Denmark or abroad.
Students with relevant vocational training may, in special cases, apply for full or partial exemption from the internship period, cf. section 6 on the rules for transfer of awarded credits.

The first four semesters of the programme must be passed before commencing the internship unless exemption has been awarded to the student. An application for an exemption must be submitted in writing. Furthermore, all workshop courses must have been assessed as approved or awarded by credit transfer.

The internship is assessed with “Pass/Fail”.

The assessment of the internship is based on a report and feedback from the company.

2.5 Elective courses

Elective courses are offered on the 6th and 7th semesters. Descriptions of the elective courses can be found in the course catalogue.

Students may select one elective course offered by other programmes at VIA University College; however, this does not include courses with focus on topics from the student’s previous studies. Any courses offered by other programmes must be approved by the Head of Programme, VIA Information and Communication Technology.

It is not allowed to retake a course once it has been passed.

2.6 Bachelor project

Students prepare for the bachelor project in the 6th semester (5 ECTS points) and the project is carried out during the 7th semester (20 ECTS points).

For the bachelor project, the student must solve a major assignment in the field of ICT Engineering and document the skills to apply engineering theories and methodologies, cf. the objectives for the VIA Information and Communication Technology stated in section 1.

Before commencing work on the bachelor project (BPR1), the student must pass courses and projects awarded with at least 110 ECTS in the first four semesters as well as having completed the internship.

In order to attend the Bachelor Project exam, all other academic elements must be passed and approved.

See section 2.1.6 for more information.

2.7 Time limits

The entire programme must be completed no later than 5½ years after the commencement of studies (cf. Executive Order No. 1160, section 2, ss. 4).

The Head of Programme may, in special cases, grant exemption from the above time limits.
2.8 Admission Test
Fourteen days into the first semester, students must attend and pass an admission test in order to continue their studies at the ICT programme. Students, who do not attend the test, must attend a new test. Students who fail to attend both tests will be withdrawn from the programme.

2.9 Structure of the semester
A semester normally covers a total of eighteen weeks, with a fifteen-week teaching/project period and a three-week exam period. The number of courses varies, depending on the semester.

3 Exam types and assessments
The student has three attempts to pass each exam. A student is automatically registered for the exam upon registration for a course. It is not possible to cancel an exam registration.

The assessment types for courses and semester projects are stated in appendices 3 and 4.

3.1 Exam types
Different exam types are applied in order to ensure individual assessment and examination of the students. The exams are in the form of individual tests.

Assessments are based on the following types of exams:
1) Written exam
2) Oral exam
3) Oral exam with a project report, process report and joint oral presentation, followed by an individual examination and assessment
4) Approval of class participation, according to detailed criteria
5) Combinations of the exam types 1-4

The exam type for each course appears from the course description, as does the length of written exams.

3.2 External and internal exams
The assessment type for each course varies between internal and external exams.

For internal exams, the examiner is appointed by the institution (usually from among the teaching staff at VIA University College).

For external exams, the examiner is appointed by the Danish Ministry of Higher Education and Science.

As a whole, at least one third of the courses taken must be assessed at external exams.
3.3 Assessments and criteria for passing

The following assessment types are used:

1) Marks according to the 7-point grading scale
2) Pass/Fail
3) Approved/Not approved

In general, each course must be assessed separately. The exam may not be repeated if the student has earned the assessment 02 or higher on the 7-point grading scale, Pass or Approved. For assessment types, cf. Appendix 4 and 5.

1) Marks according to the 7-point grading scale:
This grading scale is used for courses or projects if a mark is required.

2) Pass/Fail:
The “Pass/Fail” assessment is used for internships.

3) Approved/Not approved:
The “Approved/Not approved” assessment is used for workshops and courses in which the exam type is the lecturer’s approval of the student’s class participation. The criteria for approval are stated in the course description for each course, and may include:

- Active involvement throughout the course
- Timely submission and approval of course work
- Exercises to be carried out, and timely submission and approval of reports
- Submission of home assignments, assessed to have an overall satisfactory level
- Results of internal tests

3.4 Examination language
The examination language is English.

3.5 Extended test time
If a student suffers from any disabilities he/she can apply for an extension of the test time. If a student needs extension, he/she must provide appropriate documentation.

Send the application for test time extension by email to the Programme Secretary who will assess the application, where relevant in cooperation with the lecturers, the Student Counsellor or the Head of Studies.

3.6 Registration
A student is automatically registered for exams when the student has been registered for a course. Upon failing an exam, the student is also automatically registered for the first coming exam in the course.

If a student has not met the requirements for being registered for the exam he/she cannot participate. Examples of requirements include compulsory hand-ins, attendance, etc. The criteria will appear from the course descriptions, curriculum, etc.
When a student has failed to meet the registration requirements for the same course twice, the student will automatically be registered for the re-exam, regardless of the fact that the exam registration requirements have not been met.

It is a student’s responsibility to check his/her transcript of records at any time. Contact the Programme Secretary in case of any questions.

3.7 Academic integrity
If a student violates the guidelines stated in the exam rules he/she risks being expelled from the exam. This shall apply if e.g.
- The student contacts another student during the exam regardless of him/her receiving or giving help
- A student uses aids not permitted
- A student disturbs the exam.

Plagiarism is handled as cheating.

In written exams a student must state that the answer has been made without wrongful help.

If a student is expelled from an exam none of his/her answers will be assessed.

Any doubts during or after an exam as to whether a student has copied the work of others or reused own work without stating the sources will be reported. If the suspicion is confirmed the answers will not be assessed but it will count as an exam attempt.

4 Repeating courses, re-exam options, deadlines and complaints

4.1 Repeating courses
In general, students are not allowed to repeat courses, but must study for the re-exam as independent studies. After two failed exam attempts, the student may apply to attend the course again.

4.2 Re-exam options
As a general rule, students may always contact the Student Counsellor if they fail an exam to get help with clarification of their study situation and information about re-exams.

Illness and other valid reasons for not attending the ordinary exam must be documented to the Programme Secretary.

Re-exams and make-up exams due to illness are normally offered in the subsequent re-exam period.

A re-examination for a course that is normally assessed at a written exam may be held as an oral exam.

4.2.1 Semester project exams
If the student fails the semester project exam, the examinee(s) must improve or make a new semester project and hand in at a stated deadline. A semester project re-exam will be conducted.
4.2.2 Students in their final semester

Re-exams in 7th semester courses are conducted within the same exam period as the ordinary exams.

4.3 Deadlines

Completion of the programme is subject to the following deadlines:
- All 1st and 2nd semester courses and projects must be passed no later than two years after commencement of studies.
- The entire programme must be passed no later than 5½ years after commencement of studies.

4.4 Complaints concerning exams

The student must submit complaints about decisions made by VIA University College concerning exams to the Head of Studies within two weeks after the exam, and for the written exams, two weeks after the assessment has been announced. Decisions concerning legal issues may be brought to the attention of the Danish Ministry of Higher Education and Science. The deadline for submission of complaints is two weeks from the day the complainant was informed of the decision.

5 Leave of absence

It is possible to apply for leave of absence from the study programme in accordance with order no. 1048 of 30 June 2016 on admission to bachelor programmes. All applications must be forwarded in writing to the Student Counsellor and will be assessed individually.

The following is applicable:
- Leave of absence cannot be granted until the exams of the first year have been passed (at least 60 ECTS credits)
- Leave of absence is usually granted for the entire semester (e.g. maternity leave and leave of illness may be exceptions)
- During leave of absence, the students are considered non-active as regards SU and the calculation of the study period
- Leave of absence may be granted for up to two semesters without reason
- In case of unusual circumstances, leave of absence may be granted for up to four semesters
- After completed leave of absence, the students will be admitted under the curriculum in effect.

6 Rules regarding transfer of awarded credits

Students who have passed study elements at other institutions of higher education must apply for credit transfer for those study elements that are relevant to the ICT programme.
6.1 Workshop traineeships
Students who have passed a relevant practice-oriented course of study of at least two years in duration are exempt from the compulsory workshops described in section 2.3.

Students who can document that they have obtained the requisite workshop-related qualifications and knowledge in another manner may also be granted exemption from the workshop requirement. Substantiated applications for exemption, incl. documentation of acquired workshop-related qualifications and knowledge, must be submitted to the Student Counsellor.

6.2 Internship
Students with relevant vocational training may, in special cases, apply for full or partial exemption from the internship period. Exemption is only possible if the student can document that he/she has acquired sufficient practical experience with engineering work. Substantiated applications for exemption, incl. documentation of relevant engineering work, must be submitted to the Student Counsellor.

6.3 AP degree in Computer Science or IT and Electronics
AP Graduates in Computer Science or IT and Electronics who meet the academic admission requirements of the programme may have parts of their studies transferred, up to 120 ECTS credits.

The courses and projects to be transferred are assessed on an individual basis by the Student Counsellor.

6.4 MSc (engineering) students
Students who have completed the first two years of an MSc (engineering) programme with relevant academic content may be awarded credit transfer for those years of study equalling the first four semesters of the ICT Programme, excluding the workshops. Students with other relevant study units from MSc (engineering) studies may be awarded credit transfer for these according to an assessment on an individual basis.

6.5 Studies abroad
Students, who according to agreement with VIA University College, have studied at an institution abroad, will be awarded a credit transfer for passed study elements according to an individual assessment.

7 Title and diploma
Graduates who have completed the programme according to the terms set out in the curriculum will hold the title Bachelor of Engineering in Information and Communication Technology.

For completed study programmes, VIA University College issues a diploma stating the title, including specialisation title, and the assessments earned for each course and project. The diploma also contains information on the topic of the bachelor project, as
well as the student’s academic background on which the graduate was admitted to the programme.

8 Exemptions

VIA University College may grant exemptions from any of the rules stated in this curriculum, which are set out solely by VIA University College, if the student can document any relevant special circumstances.

9 Validity of the curriculum

This Curriculum for the Bachelor Programme in Engineering in Information and Communication Technology applies to students who commenced studies in February 2017 or later.