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Erhvervsakademi og
Professionshøjskole

CURRICULUM for the IT Technology Programme

National part, revised 01/05/2018

Approved: 15/8/2018

Signed: Programme Director

Signed: Rector

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The national part of the curriculum for the Academy Profession Degree Programme in IT Technology (IT-teknolog AK) is issued pursuant to section 18, article 1 of the Executive Order on Technical and Commercial Academy Profession Degree Programmes and Professional Bachelor's Degree Programmes.

This national part is supplemented by **the institutional part of the curriculum**, which is set by the individual institution offering the programme.

It has been prepared by the programme network for the Academy Profession Degree Programme in IT Technology and approved by each provider's Board – or by its Rector acting on authority – after taking advice from the programme committee and chief examiner for the programme at the institutions.

1 Learning outcome objectives of the programme

Knowledge

The graduate possesses knowledge and understanding of:

- communications and interface equipment generally and as applied in embedded and network-based solutions;
- programming in both embedded and network-based solutions, and the use of algorithms and design patterns to ensure effective interaction of hardware, networks and software;
- innovative problem-solving methods, project management of technical projects, businesses in general and their organization;
- customer requirements, quality and resource management and the advice and consultancy function in the solution of technical problems;
- technologies in the broad sense, and particularly as regards networks, servers, components and electronics;
- security in networks and in connection with data handling, so as to understand how secure integrated solutions are designed;
- basic aspects of technologies including operating systems, protocols, signal handling and the use of components;
- sustainability in IT solutions, and how it can be incorporated in IT-based solutions.

Skills

The graduate is able to:

- evaluate technical solutions according to business and customer requirements;
- communicate and document tasks and solutions;
- use tools and equipment in the design, development and testing of both hardware and software;
- communicate orally and in writing in the field of network technology and embedded systems;
- use innovative, customer requirement-focused methods to ensure effective solutions involving hardware, networks and software;
- use technology and tools to design, implement, test and quality-assure secure, sustainable solutions.

Competencies

The graduate is able to:

- manage the interaction between hardware, software and networks in integrated solutions;
- independently undertake the planning and quality assurance of the graduate's own technical tasks;
- in a structured setting, acquire new knowledge, skills and competencies in the subject area;
- take part in practice-oriented development processes;
- undertake customer assignments so as to translate customer requirements into secure solutions;
- in a structured setting, acquire skills and new competencies in the understanding of businesses and customers' use of IT;
- undertake analysis, needs assessment, design, implementation and testing of secure, sustainable solutions in the field of network-based and integrated technologies.

2 The programme includes four national subject components

2.1 Network Technology

Content

The subject component includes network and server technologies, operating systems, network security and communications, including protocols and services. The subject area also includes the design and use of networks and network-based/cloud solutions. The work is generally concerned with the design, development, testing, documentation and communication of secure, sustainable solutions.

Learning objectives for Network Technology

Knowledge

The student possesses knowledge and understanding of:

- network and server technologies in general, and the difference between physical and virtual technologies;
- operating systems and the differences between different systems;
- data handling, including security;
- network security, including different products;
- communication protocols and their application on different architectures.

Skills

The student is able to:

- use network technology and hardware in the design, planning and implementation of complex, secure, sustainable network solutions;
- use network technology and services for the administration, operation and monitoring of complex network solutions;
- communicate and document network tasks and solutions;
- use tools and equipment in the design, development and testing of the solutions.

Competencies

The student is able to:

- undertake analysis, needs assessment, design, development and testing of secure network solutions;
- undertake planning and quality assurance of the student's own network and server technology-related tasks;
- acquire new knowledge, skills and competencies in the field of network and server technologies;
- take part in practice-oriented development processes.

ECTS rating

The Network Technology subject component carries 18 ECTS credits.

2.2 Embedded Systems

Content

The subject component includes signal handling, component technology, communications, Internet of Things technologies, protocols, interfacing, selection and use of embedded systems and components in integrated solutions.

The subject area is generally concerned with the design, development, testing, documentation and communication of secure, sustainable solutions.

Learning objectives for Embedded Systems

Knowledge

The student possesses knowledge and understanding of:

- communications and interface equipment in general, and how it is applied in selected solutions;
- electronic modules in overview, and how selected modules are constructed;

- protocols, including communication protocols, their structure and what the differences and application options are;
- Internet of Things technologies, their structure in general and selected solutions in more detail;
- technical mathematics applied to the subject area as needed to understand electronics and/or communications;
- operating systems, their characteristics and uses;
- signal handling in a general sense, and how it is used and incorporated in solutions.

Skills

The student is able to:

- select, adapt and apply embedded systems and components in secure, sustainable solutions;
- construct and use test systems;
- document and communicate tasks and solutions using embedded components and systems.

Competencies

The student is able to:

- undertake analysis, needs analysis, design, development and testing of secure embedded and sustainable solutions;
- undertake analysis, diagnosis, testing and maintenance of the technology involved in work with electronic systems, taking account of financial, environmental and quality requirements;
- acquire new knowledge, skills and competencies in the subject area.

ECTS rating

The Embedded Systems subject component carries 18 ECTS credits.

2.3 Programming

Content

The subject area includes fundamentals of programming, the use of environments and data handling, as well as design, development, testing and documentation of solutions.

Learning objectives for Programming

Knowledge

The student possesses knowledge and understanding of:

- programming techniques in languages of different types;
- algorithms and design patterns in general and in respect of the selected programming languages.

Skills

The student is able to:

- use tools and equipment in the design, development and testing of programs;
- document, communicate and support programming-related solutions in respect of internal and customer-facing relationships.

Competencies

The student is able to:

- acquire skills and new knowledge in the field of programming;
- take part in practice-oriented development processes;
- undertake design, development and testing of major solutions in interdisciplinary collaboration.

ECTS rating

The Programming subject component carries 14 ECTS credits.

2.4 Project Management and Business Understanding

Content

The subject element includes innovation, project management, finance, quality and resource management, the advice and consultancy function, documentation and communication.

Learning objectives for Project Management and Business Understanding

Knowledge

The student possesses knowledge and understanding of:

- what innovation is and how innovative methods are used in problem solving;

- project management of IT development projects;
- how a business is organized, including which sections direct the business and how its economy can be described overall;
- quality and resource management as part of a development project and as part of the management of the maintenance of IT operations;
- The advice and consultancy function, when an IT specialist is called upon to understand and meet customer requirements.

Skills

The student is able to:

- communicate orally and in writing with both professionals and customers;
- use innovative customer requirement-focused problem-solving methods.

Competencies

The student is able to:

- undertake customer assignments so as to translate customer requirements into secure solutions;
- undertake planning, manage the student's own technical tasks and take part in projects;
- in a structured setting, acquire skills and new competencies in the understanding of businesses and customers' use of IT.

ECTS rating

The Project Management and Business Understanding subject component carries 10 ECTS credits.

2.5 Number of examinations in the national subject components

The national subject components in Year 1 of the programme amount to 60 ECTS credits (at least 45 ECTS credits out of the overall rating of the national subject elements of the programme), of which at least 45 ECTS credits belong to the examination or examinations constituting the Year 1 test.

There is also an externally examined test in the final examination project. For the number of tests in the placement, please see section 3.

For a general overview of all examinations in the programme, please see the institutional part of the curriculum, as the national subject components described in this curriculum may be examined together with subject elements set out in the institutional part of the curriculum.

3 Internship

The internship is organized so that, in combination with the other parts of the programme, it helps the student to develop practical competencies. The internship aims to enable the student to apply the methods, theories and tools of the programme through the solution of specific practical tasks involving network technology and/or integrated solutions.

Learning objectives for the internship

Knowledge

The student possesses knowledge and understanding of:

- the most important professional methods and technologies used in embedded systems and network solutions in a specific business setting.

Skills

The student is able to:

- use a variety of technical and analytical work methods associated with employment in the industry;
- evaluate practice-oriented problems and the range of possible solutions;
- structure and plan day-to-day work assignments in the profession;
- communicate practice-oriented problems and justifiable proposed solutions

Competencies

The student is able to:

- manage development-oriented practical and professional situations related to the industry, and to the placement host company in particular;
- acquire new knowledge, skills and competencies related to the industry;
- take part in professional and interdisciplinary collaboration with a professional approach.

ECTS rating

The internship carries 15 ECTS credits.

Number of examinations

The internship concludes with one examination.

4 Requirements for the final examination project

The learning objectives for the final examination project are identical to the learning objectives of the programme set out above in section 1.

The final examination project shall demonstrate the student's understanding of practice and key applied theory and method in relation to a practice-oriented problem based on a specific task within the scope of the programme. The problem, which must be key to the programme and to the industry, shall be formulated by the student, in collaboration with a private- or public-sector business if appropriate. The problem shall be approved by the institution.

The project report, which constitutes the written part of the examination, shall contain at a minimum, the following:

- front page including title;
- list of contents;
- introduction, including presentation of the problem, problem statement and angles of approach;
- background, theory, method and analysis, including a description of and justification for the choice of any empirical data,¹ in response to the problem statement;
- conclusion (remember that there must be a connection between the introduction and the conclusion; it must be possible in principle to understand these two sections without reading the background and analysis sections);
- contextualization;
- bibliography (including all sources referenced in the project);
- annexes (include only annexes essential to the report).

The final examination project shall be at least 15 and at most 20 standard pages in length. For each additional student taking part in the final project, this shall be increased by at least 10 and at most 20 standard pages.

¹ 'Empirical data is material that is the object of investigation and which may be referenced (observations, data, statements, texts, sources)', Rienecker L. & Jørgensen P.S., 2005 *Den gode opgave – opgaveskrivning på videregående uddannelser* (The Good Assignment: Assignment Writing on Higher Education Courses), 3rd ed. Frederiksberg: Samfundslitteratur.

Size of group	Minimum	Maximum
1 student	15 pages	20 pages
2 students	25 pages	40 pages
3 students	35 pages	60 pages

The title page, list of contents, bibliography and annexes do not count towards the required number of pages. Annexes are not assessed.

A standard page means 2,400/x characters including spaces and footnotes.

The final examination project test

The examination project concludes the programme in the final semester, when all preceding examinations have been passed.

ECTS rating

The final project carries 15 ECTS credits.

Examination format

The examination is an externally examined oral and written test, with an overall individual mark awarded on the 7-point scale for the written project and the oral presentation.

5 Transferable credit regulations

Successfully completed programme components are equivalent to the corresponding programme components at other educational institutions offering the programme.

The student has an obligation to declare completed programme components from another Danish or foreign higher education programme, or employment, that may be assumed to bear transferable credit.

The educational institution approves credit in each individual case on the basis of completed programme components and employment comparable with subjects, programme elements or placement elements.

The decision will be made on the basis of a professional assessment.

In the event of prior approval of a study visit in Denmark or abroad, the student has an obligation, after the study visit has ended, to provide evidence of the programme components completed during the approved study visit.

When prior approval is sought, the student shall give consent that the institution may collect the necessary information after the study visit has ended.

Upon approval in accordance with the above, the programme component shall be regarded as completed, provided that it has been passed according to the regulations governing the programme in question.

6 Entry into force and transitional arrangements

This national part of the curriculum enters into force on 01/08/2018 and shall be in effect for students enrolling after 01/08/2018.

CURRICULUM for the IT Technology Programme

Institution part, revised 14/06/2018

Approved: 22/8/2018

Signed: Programme Director



Signed: Rector



Institution part

Overview of programme components

Semester	Subject components (national and local, including electives)	ECTS
Semester 1	National subject component: Network Technology, part 1	9 ECTS
Semester 1	National subject component: Embedded Systems, part 1	9 ECTS
Semester 1	National subject component: Programming, part 1	7 ECTS
Semester 1	National subject component: Project Management and Business Understanding, part 1	5 ECTS
Semester 2	National subject component: Network Technology, part 2	9 ECTS
Semester 2	National subject component: Embedded Systems, part 2	9 ECTS
Semester 2	National subject component: Programming, part 2	7 ECTS
Semester 2	National subject component: Project Management and Business Understanding, part 2	5 ECTS
Semester 3	Local subject component 1: ITT Project A+B ITT Project A - 5 ECTS ITT Project B - 5 ECTS	10 ECTS
Semester 3	Local subject component 2: Elective based on regional requirements – see elective subject catalogue on the current LMS system (Fronter/ItsLearning)	20 ECTS
Semester 4	Placement	15 ECTS
Semester 4	Final project	15 CTS

1 Local subject components

The local components of the programme consist of study activities equivalent to 30 ECTS credits.

Local subject component 1: ITT Project A + B, each carrying 5 ECTS for a total of 10 ECTS credits.

Local subject component 2: in Semester 3, students choose from the available electives, 20 ECTS credits in total. Please see the available electives in the elective subject catalogue on the LMS.

The projects in Semester 3 may be business projects related to the elective subjects.

1.1 Local subject component A: ITT Project A

Content

The subject component shall enable the student to gain skills and acquire new knowledge in project management of IT Technology-related projects. The student follows a given project management model, preferably based on a business project.

Learning objectives for ITT Project A

Knowledge

The student possesses knowledge and understanding of:

- a project management model relevant to development projects in IT;
- a systems development method relevant to development projects in IT.

Skills

The student is able to:

- apply a project management method to development projects in IT;
- apply knowledge, methods and tools to the design, development and testing of products or systems;
- integrate technologies from elective subjects in a development project.

Competencies

The student is able to:

- manage the interaction between given technologies in integrated solutions;
- carry out planning and quality management of the student's own technical tasks;

- in a structured setting, acquire new knowledge, skills and competencies in specific sub-areas.

ECTS rating

The ITT Project A subject component carries 5 ECTS credits.

1.2 Local subject component 1B: ITT Project B

Content

The subject component shall enable the student to gain skills and acquire new knowledge in project management of IT Technology-related projects. The student selects and applies a given project management model, preferably based on a business project.

Learning objectives for ITT Project B

Knowledge

The student possesses knowledge and understanding of:

- different project management methods in IT development;
- systems development methods.

Skills

The student is able to:

- independently select and apply a project management method to development projects in IT;
- independently apply knowledge, methods and tools to the design, development and testing of products or systems;
- independently integrate technologies from electives.

Competencies

The student is able to:

- manage the interaction between hardware, software and networks in integrated solutions;
- independently undertake the planning and quality assurance of the student's own technical tasks;
- in a structured setting, acquire new knowledge, skills and competencies in the subject area.

ECTS rating

The ITT Project B subject component carries 5 ECTS credits.

1.3 Local subject component 2: elective based on regional requirements

Content

For the current range of programme component options, i.e. electives, including learning objectives and examination formats, please see the Elective Subject Catalogue, which is available on the current LMS (Fronter/ItsLearning).

ECTS rating

The subject component carries 20 ECTS credits.

2 Tests and examinations

2.1 General examination regulations

For all general examination regulations, please see the *Regulations for the Conduct of Examinations on Full-Time Programmes at UCL University College*, available on ucl.dk, and the Executive Order on Examinations on Vocational Higher Education Programmes and Executive Order on Marking Scales and Other Assessment Schemes on retsinformation.dk.

Embarking on a programme element, semester etc. also constitutes enrolment on the appropriate examinations. De-enrolment is not possible.

2.2 Examination of programme components

An overview of tests and examinations on the programme is shown below. The requirements for and details of the individual tests, including the examination period, formalities and the use of aids, are published in the **Catalogue of Examinations** on the current LMS (Learning Management System).

The student may be examined in multiple programme components at the same examination, and each individual examination will appear with a combined mark on the examination

certificate. See also the table below, if required, for when the examinations take place.

Semester	Title of examination (internal/external)	Programme component	ECTS	How shown on examination certificate
Semester 1	Semester 1 Project Examination	All	30	7-point scale
Semester 2	Year 1 Examination	All	30	7-point scale
Semester 3	Semester 3 Project Examination A	ITT Project A	5	7-point scale
	Semester 3 Project Examination B	ITT Project B	5	7-point scale
	Elective 1	Elective	5	Pass/fail
	Elective 2	Elective	5	Pass/fail
	Elective 3	Elective	5	Pass/fail
	Elective 4	Elective	5	Pass/fail
Semester 4	Internship Examination	Internship	15	7-point scale
	Final Examination Project	Project paper	15	7-point scale

2.3 Other requirements regarding completion of activities

In addition to the above-mentioned examinations, there are a number of requirements on the programme regarding completion of compulsory activities, which the student must meet in order to sit the examination and continue the programme; see the Executive Order on Examinations, section 10 and section 5, article 3.

2.3.1 Compulsory learning activities: attendance requirement and submission of work

It is a requirement of several programme components that the student shall have completed a number of compulsory learning activities in order to sit the examination. Should the compulsory learning activities not have been completed, the student may not sit the examination and will have used up one examination attempt. The student will automatically be enrolled on the next examination, and must still meet the conditions in order to sit the examination.

The compulsory learning activities vary from one programme component to another, and may for example consist of an attendance requirement, presentations or submission of work. The compulsory learning activities on the IT Technology programme are described as examination entry requirements and are set out in the Catalogue of Examinations on the current LMS (Learning Management System).

2.3.2 The Academic attitude examination

In accordance with Section 10 of the Executive Order on Examinations, a student must pass the Academic attitude examination in order to continue on the programme.

Academic attitude examination
When held: the Academic attitude examination takes place no more than two months after the start of the programme.
Format: The Academic attitude examination is described in the Catalogue of Examinations.
Assessment: Pass/fail.
Entry requirements: none.
Consequences of a 'fail' result: should the test not be passed at the first attempt, the student shall be entitled to a resit of the examination, which shall take place no more than three months after the beginning of the programme. Should the resit not be passed, the student may not continue on the programme and will be disenrolled in accordance with section 10 of the Executive Order on Examinations.
Special considerations applicable to the Academic attitude examination: in accordance with section 10, article 4 of the Order on Examinations, the Academic attitude examination is not subject to the regulations on complaints about examinations. UCL University College may waive the deadlines laid down for passing the Academic attitude examination in the case of an individual student where this is justified by illness, maternity or unusual circumstances. Evidence must be supplied of such circumstances.

2.3.3 Study activity requirements: the Year 1 test

On Academy Profession Degree programmes and Professional Bachelor's Degree programmes, the test or tests that the student must, in accordance with the Executive Order or the curriculum, take part in before the end of the first academic year following commencement of study (the Year 1 examination) must be passed before the end of the student's second academic year following commencement of study in order for the student to continue the programme.

Note that the Year 1 test described in this section consists, not of an examination, but of a requirement that all first-year examinations shall be passed before the end of the first academic year.

Consequence of failure to pass the Year 1 test

Should a student not pass the examinations in the relevant programme components, the student will be disenrolled from the programme in accordance with section 8, article 1 of the Order on Examinations and section 37, article 1, point 4 of the Order on Access.

2.4 Use of aids

All aids are permitted by default unless otherwise laid down in the Catalogue of Examinations.

2.5 Language of examination

The language of examination is the same as the language of instruction on the individual programme components, i.e. either Danish or English. In Danish-language examinations, tests may be taken in Swedish or Norwegian unless the purpose of the test is to demonstrate the student's Danish skills; see section 18 of the Order on Examinations.

Should the University College have decided to conduct all or part of the programme with instruction in English in view of classes being attended by both Danish and international students, it shall be permissible to sit the examination in Danish unless one of the objectives of the subject is to demonstrate foreign language skills.

3 Other programme regulations

3.1 Teaching and working formats

Several different teaching and working formats are in use at UCL University College. These include lectures, casework, business projects, minor assignments, practical and theoretical exercises, laboratory work, oral presentations, homework, excursions etc.

Instruction may also be topic-based or divided into different subjects. The aim of the work formats is that, through the approach selected by the programme, students should acquire

knowledge, skills and competencies in the core areas of the programme, and that the student should also apply these in accordance with the learning objectives of the programme.

Further details of the course of study, i.e. objectives, content, structure, working formats etc., may be found in the Lecture Plans available on the current LMS (Learning Management System).

3.2 Differentiated instruction

Differentiated instruction is used to the extent relevant.

3.3 Language of study

IT Technology is an English-language programme, and all instruction is therefore offered in English. In individual cases, it may be possible to take elective programme components in Danish, and it will also be possible to go on placement with a Danish-speaking company.

3.4 Regulations on the conduct of the placement

Requirements applicable to the parties involved

The placement host company shall make a contact person available to the student during the placement.

In collaboration with the student, the contact person shall draw up a placement agreement stating which tasks the student will work on during the placement. The tasks must confirm to the placement learning objectives.

In the organization of the placement, account shall be taken of the student's pre-requisites and prior abilities. The placement agreement shall be forwarded to the educational institution for approval.

For IT Technology, UCL University College has appointed a number of placement supervisors, one of whom shall act as coaching partner to the student throughout the placement, and shall also act as examiner in respect of the placement report.

When the placement is over, UCL University College shall prepare an electronic evaluation of the placement, with the participation of both the student and the company.

3.5 Spelling and clarity of expression

Whichever language the project report is written in, the student's spelling ability and clarity of expression shall be taken into account in the marking of the final project, but with most weight attached to the academic content, in accordance with section 35, article 4 of the Order on Examinations,

3.6 Study visit

The programme does not include a compulsory study visit.

However, a study visit abroad is conducted as part of the programme in Semester 3. Further details and conditions of the study visit are described in the document 'Study Visit', available on the current LMS (Learning Management System).

3.7 Waiver regulations

UCL University College may waive anything laid down in this curriculum by the institution(s) alone if this is justified by special circumstances.

A student must apply for a waiver and provide evidence of the special circumstances causing the need for it. UCL University College will consider the case and give notice of its decision when available. Regulations regarding waivers and how to apply for them are set out in more detail on the UCL University College website, ucl.dk.

3.8 Leave of absence

It is possible to apply for leave of absence from the programme on such grounds as maternity, adoption or military call-up. UCL University College cannot grant a student leave of absence until the person concerned has passed the examinations following the first academic year on an Academy Profession Degree programme or a Professional Bachelor's Degree programme, or has completed the first half-year of study on a self-contained top-up programme (Professional Bachelor).

Detailed regulations regarding leave of absence and how to apply for it may be found on the UCL University College website, ucl.dk.

UCL University College may waive these regulations if special circumstances apply.