Computer Science

Curriculum 2016

ERHVERVS
AKADEMI
SYDVEST

Indholdsfortegnelse

1 Programme structure

		1st year	2nd year	3rd year
Core area:	Programming (40 ECTS)	30 ECTS	10 ECTS	
	System development (25 ECTS)	15 ECTS	10 ECTS	
	Technology (15 ECTS)	5 ECTS	10 ECTS	
	The company (10 ECTS)	10 ECTS		
[illegible]			30 ECTS	
[illegible]				15 ECTS
[illegible]				15 ECTS

2 Programme core areas and ECTS credits

The study programme consists of the following core areas:

- Programming (40 ECTS)
- System development (25 ECTS)
- Technology (15 ECTS)
- The company (10 ECTS)

A total of 90 ECTS credits

2.1 Programming

The purpose of the Programming core area is to contribute to qualifying students to efficiently and professionally create and implement IT systems with relevant qualities by using modern and up-to-date programming techniques and software construction tools.

ECTS credits

40 ECTS.

Learning outcomes

The students should have achieved knowledge of

- Specification of abstract data types;
- Criteria for program quality;
- Abstraction mechanisms in modern programming language; and
- Integration between heterogeneous components and platforms.

Skills

The students should be able to

- Specify and construct algorithms;
- Use the programming language to realise algorithms, design patterns, abstract data types, data structures, design models and user interfaces;
- Assess qualitative and quantitative algorithm and data structure properties;
- Use a modern integrated development tool, including version control system;
- Realise models in a database system and construct programs using a database interface;
- Design and construct programs as collaborating processes/threads;
- Develop applications based on a layered software architecture;
- Use software components/libraries;
- Draw up documentation in respect of current de facto standards in the profession;
- Use modern techniques and tools to conduct tests and quality assurance;

- Use techniques to construct programs that support multiple concurrent users;
- Design and construct programs based on collaborating processes in a distributed architecture;
- Construct programs that use contemporary network technologies;
- Use design patterns for distributed software architecture;
- Develop software components; and
- Develop web applications.

Competences

The students should be able to

- Act as professional programmers in development, integration and maintenance projects; and
- Acquire new skills within programming language, development tools, programming techniques and program design.

2.2 System development

Contents

The purpose of the System development core area is to contribute to qualifying students to efficiently and professionally participate in developing IT systems with relevant qualities.
Further, the core area is to contribute to qualifying the students to make new developments, developments from idea to running system as well as further development and integration of IT systems on a systematic basis using situational modern system development methods and techniques.

ECTS credits

25 ECTS.

Learning outcomes

- Graduates should have achieved knowledge ofthe role of experiments as part of or a supplement to the system development method; and
- the role of quality criteria in the system development process and the system's final design.

Skills

The students should be able to

- Model and design IT systems;
- Use a suitable software architecture;
- Document and communicate product and process – including traceability;
- Quality assure product and process;
- Use suitable design patterns;
- Involve users;
- Design situation-specific user interfaces and choose a process model and system development method;
- Work systematically on a project subject to a chosen system development method;
- Plan, assess, and regulate a project;
- Select and use suitable design patterns and components; and
- Design systems that are integrated with other systems.

Competences

The students should be able to

- Participate competently in a development project;
- Situationally adapt a system development method to a project;

- Participate competently in a development project;
- Acquire new process models and system development methods; and
- Reflect on and adapt processes and methods in practice.

2.3 Technology

Contents
The purpose of the Technology core area is to qualify students to contribute to the selection and application of technology in the context of system development and programming of distributed IT systems and provide students with basic knowledge of technology aspects.

ECTS credits
10 ECTS credits.

Learning outcomes
The students should have achieved knowledge of
- Facilities and construction of contemporary operating systems;
- Facilities and functions of contemporary database systems;
- Multiple-user issues;
- Principles of design and implementation of distributed systems; and
- Fundamental network concepts.

Skills
The students should be able to
- Use mechanisms for synchronisation of processes and threads;
- Use central security concepts and threats;
- Use virtualisation;
- Use services and programming interface for communication; and
- Apply common application protocols.

Competences
The students should be able to
- Acquire knowledge about new operating systems and database systems; and
- Reflect on choice of infrastructure in connection with development of distributed systems.

2.4 The Company

Contents
The purpose of the Company core area is to contribute to qualifying students to include relevant business aspects and business understanding in connection with system development.
Further, the core area is to contribute to qualifying students to work in a system development organisation and take part in development, continued development and integration of IT systems for various kinds of organisations.

ECTS credits
10 ECTS.

Learning outcomes
The students should have achieved knowledge of
- How IT can improve business processes and develop the business;
- Common systems in the company, including organisational concepts;
- The rationale behind IT investments; and

- IT security.

Skills
The students should be able to
- Analyse and model business processes;
- Participate in project work;
- Apply innovative methods while focusing on project work in practice-oriented development projects;
- Communicate internally and externally; and
- Participate in IT implementation and change management.

Competences
The students should be able to
- Participate in and see the connection between design of business processes and design of IT systems;
- Collaborate with representatives of the user organisation and the development organisation based on business understanding; and
- Acquire knowledge of new technology in a commercial perspective.

3 Compulsory educational components within the core programme areas
The programme's compulsory educational components are:
- Programming, System development, Technology and the Company (60 ECTS)
- Programming and Technology (20 ECTS)
- System development (10 ECTS)

A total of 90 ECTS credits

The three compulsory educational components are concluded with an exam.

3.1 Compulsory educational component: Programming, System development, Technology and the Company

Contents
This purpose of this first compulsory educational component is to contribute to qualifying the students to
- effectively and professionally create and implement IT systems with interfaces towards users and databases as well as master fundamental elements of the computer science profession;
- make new and further developments of small database-based systems from idea to running system on a systematic basis using a specific up-to-date method and associated system development tools;
- contribute to the selection and use of technology in the context of system development and programming of IT systems as well as acquire thorough knowledge of aspects of technology; and
- include relevant business aspects and business understanding in connection with system development and work in a system development organisation as well as take part in development, further development and integration of IT systems for various kinds of organisations.

ECTS credits
60 ECTS credits, distributed across:
- 30 ECTS from Programming
- 15 ECTS from System development

- ECTS from Technology
- 10 ECTS from the Company

Learning outcomes

The students should have achieved knowledge of

- Specification of abstract data types;
- Criteria for program quality; and
- Abstraction mechanisms in modern programming language.

Knowledge System development)

The students should have achieved knowledge of

- The role of experiments as part of or a supplement to the system development method; and
- The role of quality criteria in the system development process and the system's final design.

Knowledge (Technology)

The students should have achieved knowledge of

- Facilities and construction of contemporary operating systems;
- Facilities and functions of contemporary database systems; and
- Multiple-user issues.

Knowledge (The company)

The students should have achieved knowledge of

- How IT can improve business processes and develop the business;
- Common systems in the company, including organisational concepts;
- The rationale behind IT investments; and
- IT security.

Skills (Programming)

The students should be able to

- Specify and construct algorithms;
- Use the programming language to realise algorithms, design patterns, abstract data types, data structures, design models and user interfaces;
- Use a modern integrated development tool, including version control system;
- Realise models in a database system and construct programs using a database interface;
- Design and construct programs as collaborating processes/threads;
- Develop applications based on a layered software architecture;
- Use software components/libraries;
- Draw up documentation in respect of current de facto standards in the profession;
- Use modern techniques and tools to conduct tests and quality assurance; and
- Assess qualitative and quantitative algorithm and data structure properties.

Skills (System development)

The students should be able to

- Model and design IT systems;
- Use a suitable software architecture;
- Document and communicate product and process – including traceability;
- Quality assure product and process;
- Use suitable design patterns;
- Involve users; and
- Design user interfaces.

Skills (Technology)

The students should be able to

- Use mechanisms for synchronisation of processes and threads.

Skills (The company)
The students should be able to

- Analyse and model business processes;
- Participate in project work;
- Apply innovative methods while focusing on project work in practice-oriented development projects;
- Communicate internally and externally; and
- Participate in IT implementation and change management.

Competences (Programming)
The students should be able to

- Act as professional programmers in development and maintenance projects; and
- Acquire new skills within programming language, development tools, programming techniques and program design.

Competences (System development)
The students should be able to

- Participate competently in a development project; and
- Reflect on and adapt processes and methods in practice.

Competences (Technology)
The students should be able to

- Acquire knowledge about new operating systems and database systems.

Competences (The company)
The students should be able to

- Participate in and see the connection between design of business processes and design of IT systems;
- Collaborate with representatives of the user organisation and the development organisation based on business understanding; and
- Acquire knowledge of new technology in a commercial perspective.

The compulsory educational component is completed with an exam (1st-year exam).

Assessment
The exam is graded according to the 7-point grading scale and is worth 60 ECTS.

The learning outcomes for the educational component are the same as the learning outcomes for the exam.

See the institutional section of this Curriculum for exam form, exam procedure, etc.

3.2 Compulsory educational component: Programming and Technology

Contents
The purpose of this second compulsory educational component is to contribute to qualifying the students to

- Master more sophisticated elements in the computer science profession and realise distributed software systems; and
- Contribute to the selection and use of technology in the context of system development and programming of distributed IT systems as

well as give the students thorough knowledge of aspects of technology.

ECTS credits
20 ECTS credits, distributed across:
- 10 ECTS from Programming
- 10 ECTS from Technology

Learning outcomes
The students should have achieved knowledge of
- Integration between heterogeneous components and platforms.

Knowledge (technology)
The students should have achieved knowledge of
- Principles of design and implementation of distributed systems; and
- Fundamental network concepts.

Skills (programming)
The students should be able to
- Use techniques to construct programs that support multiple concurrent users;
- Design and construct programs based on collaborating processes in a distributed architecture;
- Construct programs that use contemporary network technologies;
- Use design patterns for distributed software architecture;
- Develop software components; and
- Develop web applications.

Skills (technology)
The students should be able to
- Include relevant technological aspects in the development of distributed systems, including:
- Central security concepts and threats;
- Use of virtualisation;
- Use of services and programming interface for communication; and
- Application of common application protocols.

Competences (programming)
The students should be able to
- Act as professional programmers in integration projects; and
- Acquire new skills within programming language, development tools, programming techniques and program design.

Competences (technology)
The students should be able to
- Reflect on choice of infrastructure in connection with development of distributed systems.
- The compulsory educational component is completed with an exam (Programming exam).

Assessment
The exam is graded according to the 7-point grading scale.

The learning outcomes for the educational component are the same as the learning outcomes for the exam.

See the institutional section of this Curriculum for exam form, exam procedure, etc.

3.3 Compulsory educational component: System development

Contents
The purpose of this third compulsory educational component is to contribute to qualifying the students to make new and further developments and integration of distributed IT systems on a systematic basis using situational modern system development methods and techniques.

ECTS credits
10 ECTS from the System development core area.

Learning outcomes
The students should have achieved knowledge of

- The role of quality criteria in the system development process and the final system design.

Skills
The students should be able to

- Choose a situation-specific process model and system development method;
- Work systematically on a project subject to a chosen system development method;
- Plan, assess and regulate a project;
- Document and communicate product and process – including ensure traceability;
- Select and use suitable design patterns and components; and
- Design systems that are integrated with other systems.

Competences
The students should be able to

- Situationally adapt a system development method to a project;
- Participate competently in a development project;
- Acquire new process models and system development methods; and
- Reflect on and adapt processes and methods in practice.

The compulsory educational component is completed with an exam.

Assessment
The exam is graded according to the 7-point grading scale.

The learning outcomes for the educational component are the same as the learning outcomes for the exam.

See the institutional section of this Curriculum for exam form, exam procedure, etc.

4 Number of exams in the compulsory educational components

Each of the three compulsory educational components is concluded with an exam. See an overview of the study programme exams in the "Overview of exams" paragraph.

Overview of ECTS credits across the core areas and the compulsory educational components

Core areas				
The company	10 ECTS			**10 ECTS**

10 ECTS				
System development 25 ECTS	15 ECTS		10 ECTS	**25 ECTS**
Programming 40 ECTS	30 ECTS	10 ECTS		**40 ECTS**
Technology 15 ECTS	5 ECTS	10 ECTS		**15 ECTS**
A total of 90 ECTS credits	**60 ECTS**	**20 ECTS**	**10 ECTS**	**A total of 90 ECTS credits**

5 Internship

Contents
Internship is organised in such a way that the students develop practical competences, in combination with the other parts of the programme. The purpose of the internship is to enable the students to use the study programme's methods, theories and tools by performing specific practical tasks and assignments within computer science.

ECTS credits
15 ECTS.

Learning outcomes
The students should have achieved knowledge of

- Day-to-day operations throughout the place of internship.

Skills
The students should be able to

- Use versatile technical and analytical working methods related to employment in the profession;
- Assess practice-oriented issues and set up solution proposals;
- Structure and plan day-to-day tasks in the profession; and
- Communicate practice-oriented issues and substantiated solution proposals.

Competences
The students should be able to

- Handle development-oriented, practical and discipline-specific situations in respect of the profession;
- Acquire new knowledge, skills and competences in respect of the profession; and
- Participate in discipline-specific and interdisciplinary collaboration with a professional approach.

The internship is concluded with an exam.

The learning outcomes for the educational component are the same as the learning outcomes for the exam.

See the institutional section of this Curriculum for exam form, exam procedure, etc.

6 The final exam project

ECTS credits
15 ECTS.

Final exam project requirements

The purpose of the final exam project is to document the students' understanding of practice and centrally applied theory and method in relation to a practice-oriented problem or issue based on a specific assignment within the field of the programme. The problem or issue, which must be central to the study programme and the profession, must be formulated by the students in the problem statement and research question, possibly in collaboration with a private or public company. The educational institution must approve the problem statement and research question.

A project report and perhaps a product are to be submitted.

The project report, which constitutes the written part of the exam, must as a minimum include:

- Cover page with title
- Table of contents
- Introduction, including problem statement and research question
- Main section
- Conclusion
- Reference list (incl. all sources referred to in the project).
- Appendices (include only appendices central to the report)

The project report may not exceed 20 standard pages + 20 standard pages per student.
Said pages are exclusive of cover page, table of contents, reference list and appendices. Appendices will not be assessed.
A standard page is 2,400 pages including spaces and footnotes.

Writing and spelling skills

Writing and spelling skills form part of the final exam project. The assessment is expressed as an overall assessment of the discipline-specific content as well as the students' writing and spelling skills.

Students who can document a relevant specific disability may apply for exemption from the requirement that writing and spelling skills are included in the assessment. The application is to be submitted to the study programme and directed to the attention of the programme director not later than four weeks before the exam is to be held.

Learning outcomes

The final exam project must substantiate that the students have reached the final level of the programme, cf. Annex 1 of Ministerial Order no. 975 of 19 October 2009 on the Academy Profession Degree Programme in Computer Science.

The goals for learning outcomes comprise the knowledge and competences that a graduated student of computer science must achieve during the education.

Knowledge

Graduates should have achieved knowledge of

- Common practices, theories and research methods for software development;
- Basic business conditions in relation to system development; and

- The technological concepts and the technological basing of IT systems in relation to programming, troubleshooting and initialisation.

Skills
Graduates should be able to

- Methodically identify IT-system requirements and assess the extent to which those requirements can be satisfied under the given circumstances;
- Use modern and up-to-date programming techniques and tools for software construction, including ensure the quality of the developed product;
- Document the performed work in such a way that the documentation is usable for the specified target group;
- Use the relevant knowledge for system development, programming and initialisation;
- Conduct systematic troubleshooting and correct errors in connection with IT systems;
- Assess practice-oriented IT issues as well as propose and select possible solutions; and
- Communicate practice-oriented issues and possible solutions to partners and users.

Competences
Graduates should be able to

- Contribute to the development of practice in software development;
- Participate in project work in a competent way;
- Take a professional approach to discipline-specific and interdisciplinary collaboration in software development;
- Participate in system development using modern methods, techniques and tools; and
- In a structured context acquire new knowledge, skills and competences in relation to the IT sector, including domain knowledge and technological knowledge as well as acquisition of new methods, techniques and tools.

Assessment
The exam is externally assessed and graded according to the 7-point grading scale.

The exam is made up of a project and an oral examination. One individual overall grade is given. The exam will not take place until the final internship exam and the other exams of the study programme have been passed.

See the institutional section of this Curriculum for exam form, exam procedure, etc.

7 Overview of exam
Overview of all examinations and their order

Exam:	150 ECTS distributed across the exams	Assessment

Academic aptitude examination, if any1	–	Pass/fail
1st year exam	60	7-point grading scale
Programming exam	20	7-point grading scale
System development exam	10	7-point grading scale
Elective component exam(s)2	30	7-point grading scale
Internship exam	15	7-point grading scale
Final degree project	15	7-point grading scale

8 Credit transfer

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

The students must provide information on completed educational components from another Danish or international further education and on employment assumed to result in credit transfer. In each case the educational institution approves credit transfer based on completed educational components and employment that match up to subjects, educational components and internship components. The decision is made based on a professional assessment.

8.1 Pre-approved credit transfer

The students can apply for pre-approved credit transfer. Upon pre-approval of a study period in Denmark or abroad the students must, after conclusion of their study, document the completed educational components of the approved study. In connection with the pre-approval the students must give their consent to the institution obtaining the necessary information following completed study.

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

8.2 Credit agreements

None.

9 Exemption

The institutions may grant exemption from these rules in this national section of the curriculum that are laid down solely by the institutions, when found substantiated in exceptional circumstances. The institutions cooperate on a uniform exemption practice.

10 Effective date and transition provisions

This national section of the curriculum enters into force on 1 September 2014 with effect for all students who are and will be registered for the study programme and for exams commenced on said date or thereafter.

Transition provisions, if any, for students registered before August 2014 are found in the institutional section.

1. An academic aptitude examination will be described in the national curriculum.
2. Elective components and exams are described in the institutional curriculum.

Institutional section 2016

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1 Exam Overview

Overview of examinations and time frame:

Time Frame	Exam	ECTS credits	Internal/External	National/ Local	Evaluation
2nd semester	1. First Year Examination Compulsory element: Programming, Systems Development, Technology and Business	60	External	National	7 – point grading scale
3rd semester	Programming Compulsory element: Programming and Technology	20	External	National	7 – point grading scale
	Systems Development Compulsory element: Systems Development	10	Internal	National	7 – point grading scale
4th semester	4. Specialisation	30	Internal	Local	7 – point grading scale
5th semester	5. Internship	15	Internal	National	7 – point grading scale
	6. Final exam project	15	External	National	7 – point grading scale

Information about time and place for the examinations will be posted on

2 Scope and criteria for examinations

2.1 First Year Examination – Examination in the compulsory educational element Programming, Systems Development, Technology and Business Understanding

Prerequisites for the exam, including compulsory participation

The following requirements apply:

- There are compulsory participation requirements that must be met in order to be qualified to dothe exam. These ten requirements are described on EASV SharePoint. Failure to meet these requirements without a valid reason (e.g. illness, maternity leave or exceptional circumstances) is considered to indicate a lack of academic activity and can lead to suspension of any state education

grant. Decisions on the consequences of lack of participation are made by the student counsellor in consultation with the head of department after meeting with the student in question, and will be based on an individual assessment.

- The written project, on which the examination and appraisal are based, is to:
  - Meet all formal requirements, cf. below, and
  - Be submitted on time, cf. examination schedule available on EASV SharePoint.

Note that

- If one or more of the participation requirements is not met, or
- The written project, which comprises the written part of the exam, is not submitted correctly the student will not be allowed to sit the exam, and one examination attempt will have been spent.

The examination

This examination is an external, oral group exam and is based on a written group project. Grading is according to the 7-point grading scale.

Groups are to consist of 2 – 4 students; any exception to this requirement is to be approved by the head of department.

The examination represents 60 ECTS.

One combined grade for the written report and the oral presentation is given.

The project is presented by the project group in the oral exam, the duration of which is max. 30 minutes. This is followed by an individual examination, lasting 30 minutes including grade evaluation, of each member of the group.

Formal requirements for the written project report

The following components should be included:

- Front page with title of the report
- Table of contents
- Introduction, including main issues, problem statement and approaches
- Conclusion (Remember to ensure correlation between the introduction and the conclusion. It should in principle be possible to understand the report without reading the background and analysis sections).
- Discussion, putting the findings into perspective
- Bibliography (including all sources referred to in the report)
- Appendices (including only those documents that are central to the report)

The project must be minimum 20 standard pages and a maximum of 40 standard pages.

A standard page is defined as 2400 characters, including spaces and footnotes, but excluding the front page, table of contents, bibliography and appendices. Appendices are not included in the grading evaluation.

Assessment criteria

The evaluation criteria for the examination are the learning objectives for the compulsory educational element Programming, Systems Development, Technology and Business Understanding offered during the 1st and 2nd semester

Learning objectives can be seen in the national section of the Curriculum.

Timing
The examination is held at the end of the 2nd semester. Further information regarding date and place as well as submission of the written group report can be found on EASV SharePoint.

The exam must be passed before the end of the first year of study if the student is to be allowed to continue in the program.

The head of department can grant the individual student exemption from the specified deadlines for passing the examination if this is justified by illness, maternity leave or exceptional circumstances.

Language
English/Danish

2.2 Examination in Programming – Examination in the compulsory educational element Programming and Technology

Prerequisites for exam, including compulsory participation
The following requirements apply:

- There are compulsory participation requirements that must be met in order to be qualified to sit the exam. These requirements are described at EASV SharePoint. Failure to meet these requirements without a valid reason (e.g. illness, maternity leave or exceptional circumstances) is considered to indicate a lack of academic activity and can lead to suspension of any state education grant. Decisions on the consequences of lack of participation are made by the student counsellor in consultation with the head of department after meeting with the student in question, and will be based on an individual assessment.
- In case of a written project it must be submitted on time, cf. examination schedule available on EASV SharePoint.

Note that
If one or more of the participation requirements is not met, or the written project, which comprises the written part of the exam, is not submitted correctly the student will not be allowed to sit the exam, and one examination attempt will have been spent.

The examination

This is an external oral examination.

The oral examination lasts for 40 minutes, including evaluation. One combined grade for the optional written report and the oral presentation is given.

The examination represents 20 ECTS

Assessment criteria

The evaluation criteria for the examination are the learning objectives for the compulsory educational element Programming and Technology offered during the 3rd semester of the education.

Learning objectives can be seen in the national section of the Curriculum.

Timing

The examination is held at the end of the 3rd semester. Further information regarding time and place can be found on EASV SharePoint.

Language

English/Danish

2.3 Examination in Systems Development – Examination in the compulsory educational element Systems Development

Prerequisites for the exam, including compulsory participation

The following requirements apply:

- There are compulsory participation requirements that must be met in order to be qualified to sit the exam. These requirements are described at EASV SharePoint. Failure to meet these requirements without a valid reason (e.g. illness, maternity leave or exceptional circumstances) is considered to indicate a lack of academic activity and can lead to suspension of any state education grant. Decisions on the consequences of lack of participation are made by the student counsellor in consultation with the head of department after meeting with the student in question, and will be based on an individual assessment.
- In case of a written project it must be submitted on time, cf. examination schedule available on EASV SharePoint.

Note that
If one or more of the participation requirements is not met, or
The written project, which comprises the written part of the exam, is not submitted correctly the student will not be allowed to sit the exam, and one examination attempt will have been spent.

The examination

This is an internal individual examination graded according to the 7-point grading scale.

Groups are to consist of 2 – 4 students; any exception to this requirement is to be approved by the head of department.

The examination represents 10 ECTS

One combined grade for the written report and the oral presentation is given.

The project is presented by the student in 15 minutes, followed by an examination dialogue. The entire exam lasts 30 minutes including grade evaluation.

Description of the tests and the formal requirements can be found on EASV SharePoint

Assessment criteria
The evaluation criteria for the examination are the learning objectives for the compulsory educational element Programming and Technology offered during the 2nd year of the education.

Learning objectives can be seen in the national section of the Curriculum.

Timing
The examination is held at the end of the 3rd semester. Further information regarding time and place can be found on EASV SharePoint.

Language
English/Danish

3 Elective educational elements

Contents
The elective educational elements give the student an opportunity to gain additional competences through specialisation within topics broadly related to the IT field.

A number of elective courses are offered each year. These courses, which are posted on EASV SharePoint, are created in close cooperation with the local business community and with input from both teachers and students.

Students can arrange their elective courses as a theoretical and/or practical educational process. Approval from the school must be gained.

ECTS credits
The elective elements account for a total of 30 ECTS credits. The various elements will be offered in multiples of 5 ECTS.

Learning objectives
The specific learning objectives for each elective are described in the subject description to be found on EASV SharePoint.

General learning objectives for the elective elements are as follows:

Knowledge
The student has knowledge about:
- Theory and practice in relation to the topics chosen
- Relevance of the topics chosen in relation to theory and practice within the IT-field

Skills
The student is able to:
- Select, describe and carry out literature search related to a self-selected IT-related issue
- Discuss societal aspects related to the chosen topics
- Evaluate issues and suggest solutions in relation to the topics chosen
- Communicate central results

Competences
The student is able to:

- Independently familiarize him-/herself with new topics within the theory and/or practice of the subject areas
- Put into perspective and relate the chosen topics to other subject areas within the education.

Timing
Electives are offered during the 4th semester of the education.

Prerequisites for the exam, including participation requirements
The following applies:

- Participation requirements can be linked to the examination in the form of submission of a synopsis. This will be specified on EASV SharePoint. Failure to meet this requirement without a valid reason (e.g. illness, maternity leave or exceptional circumstances) is considered to indicate a lack of academic activity and can lead to suspension of any state education grant. Decisions on the consequences of lack of participation are made by the student counsellor in consultation with the head of departmentafter meeting with the student in question, and will be based on an individual assessment.

Failure to meet the specified requirements means that the student is not allowed to sit the exam, and that one examination attempt has been spent.

Examinations
An internal oral examination, which can be based on a synopsis that is not included in the overall evaluation, is held in each elective element. Assessment is according to the 7-point grading scale.

Language
English/Danish

4 Internship

Requirements and expectations
The internship allows the student to work with relevant issues and gain knowledge about relevant job functions. The relation between theoretical learning and actual practice forms the basis for the student's objectives for the internship period.

Based on the learning objectives for the internship (see the national section of the Curriculum), the student, the internship company and the school supervisor collaborate to identify specific objectives for the internship period.

This then forms the basis for the orchestration of the student's work during the internship period.

The internship can be compared to a full-time job, with demands regarding working hours, work to be done, involvement and flexibility that correspond to those that a Computer Scientist graduate can expect to meet in his/her first job.

Prerequisites for the exam
The following requirements apply:

- Front page with student name, internship company, and internship period
- Preface
- Introduction, including main issues, problem statement and approaches
- Reflection of the learning outcome
- Description of specific jobs done during the internship
- Conclusion
- Appendix: Statement from the internship company and the students diary/internship log
- Bibliography (including all sources referred to in the report)
- Other Appendices (including only those documents that are central to the report)

The maximum number of pages is 10 standard pages. A standard page is defined as 2400 characters, including spaces and footnotes, but excluding the front page, table of contents, bibliography and appendices. Appendices are not included in the grading evaluation.

The presentation can be held via video conference. Timing can be seen in the semester plan on EASV SharePoint.

Note that failure to meet one or more of the above requirements means that the student will not be allowed to sit the exam, and that one examination attempt will have been spent.

The examination
This examination is an internal oral exam, based on the internship report. Evaluation is graded according to the 7-point grading scale.

The student presents relevant parts of the internship report in approximately 10 minutes, followed by an examination dialogue where all parts of the internship can be included. The exam lasts for 20 minutes including evaluation.

The examination represents 15 ECTS.

Assessment criteria
The evaluation criteria for the examination are based on the individual student's learning objectives which have been defined in a collaboration between the student, the school supervisor and the internship company prior to the start of the internship period, and which have been specified in the contract included in EASV's internship system (CRM).

Timing
The examination is held halfway through the 5th semester. Further information regarding time and place can be found on EASV SharePoint.

Language
English/Danish

5 Final examination project

Requirements regarding the final exam project as well as learning objectives can be found in the joint study section of the Curriculum for the Computer Science programme.

Prerequisites for the exam

The following requirements apply:

- The written report, on which the examination and appraisal are based, is to:
- Meet all formal requirements for the final exam project, cf. joint study section of the Curriculum, and
- Be submitted on time, cf. examination schedule available on EASV SharePoint.

Note that failure to submit the written project correctly means that the student will not be allowed to sit the exam, and that one examination attempt will have been spent.

The examination in the final project cannot be held until the internship exam and all other exams in the education have been passed.

The examination

This is an internal individual examination graded according to the 7-point grading scale.

Groups are to consist of 2 – 4 students; any exception to this requirement is to be approved by the head of department.

One combined grade for the written report and the oral presentation is given.

The project is presented by the student in 15 minutes, followed by an examination dialogue. The entire exam lasts 30 minutes including grade evaluation.

The project must fill at least 20 and maximum 40 standard pages. The maximum number of pages required increases by 20 standard pages for each student participating in the group.

The final exam project represents 15 ECTS.

Assessment criteria

The evaluation criteria for the examination are based on the learning objectives for the final project in the national section of the Curriculum.

Timing

The examination is held at the end of the 5th semester. Further information regarding time and place can be found on EASV SharePoint.

Language

English/Danish

6 Educational elements completed abroad

The student can – with prior approval – obtain credit for any of the educational elements that have been taken abroad. In such cases the student must, after completion of his/her studies abroad, document the educational elements that have been taken. In connection with prior approval, the student must agree that the school is entitled to secure any necessary information about the educational elements.

With prior acceptance of credits, the specific educational element will be considered as being completed if the student has passed the course according to existing and relevant rules for the Computer Science education.

7 Teaching methods

Teaching in the Computer Science degree programme is conducted as a dynamic and interactive process, where focus in placed on active participation by the students, and where both students and instructors contribute constructively to the learning process. The individual student is expected to be responsible for his or her own learning.

To ensure optimal and professional learning, as well as the personal development of the individual student, teaching in the programme makes use of a variety of teaching methods. Emphasis is placed on dialogue, discussion and project work, with instruction methods ranging from classroom teaching to interdisciplinary cases, thematised assignments and teamwork. Visiting lecturers and company visits are also arranged.

Teaching form
Teaching is based on applied theory and relevant business practice, i.e. general problems and issues in the IT industry.

Topics and themes are selected which cover issues relevant for different types of businesses, with focus on the challenges presented by a changing environment, ongoing developments and increasing internationalisation.

Instruction will focus on work and learning methods that enhance the student’s abilities to work independently, collaborate with others and think innovatively – using classroom teaching, project work in groups, and individual assignments as central teaching forms. The student is involved in the planning of the course and is encouraged to make use of teamwork, interactive learning and creative thinking.

8 Credits for elective educational elements
Any elective educational element that has been passed is considered to be equivalent to the corresponding educational element offered by other educational institutions offering the Computer Science or other education.

The student is to apply for prior approval if credit is wished for educational elements that are not included in the Computer Science education.

9 Participation requirements
To facilitate the teaching forms used, students are required to participate actively in relevant activities, including the submission and presentation of assignments and projects.

Participation requirements can also be a stipulation or prerequisite for examinations. Attendance can also be compulsory for certain of the elements in the course.

Participation and attendance requirements that are prerequisites for an examination can be found in the examination specifications of the individual course.

10 Criteria for evaluating student activity

Enrolment can be terminated for students who have not participated actively in their studies during a consecutive period of at least one year. Active participation is defined as follows:
Within the last 12 calendar months the student has:

- Participated in at least two different examinations
- Passed at least one examination
- Lived up to the participation requirements for the education, including group work, joint projects, distance learning, etc. as can be seen in the description of participation requirements and submission of reports described for the examinations.
- Submitted the assignments, reports, etc. which are a prerequisite for an examination in accordance with the Curriculum, with a trustworthy content. This includes not having submitted material for which others have copyright.
- Attended activities with compulsory attendance as specified in the Curriculum.

Failure to meet one or more of the above criteria can lead to termination of the student's enrolment in the education.

Periods in which the student is not active due to leave of absence, maternity leave, adoption, documented illness or military service are not included in the above. The student must, if so required, supply documentation for such conditions.

Exemption can be granted from the above requisites in the case of exceptional circumstances.
Applications for exemption are to be sent to the head of department.

Prior to termination of enrolment in the education, the student is to be sent a written notice that points out the above-mentioned rules. This notice also specifies that the student has 14 days in which to submit documentation for periods with a lack of student activity that the student claims should not lead to expulsion, and specifies as well a deadline for seeking exemption.

If the student has not reacted within this period of time, he/she is expelled from the education.

If the student requests that he/she not be expelled, this request will have a delaying effect until the head of departmenthas decided upon the matter.

The student is entitled to submit a complaint to the head of departmentabout a decision that has been made two weeks at the latest after being informed of the decision. This complaint will have a delaying effect. If the head of departmentmaintains the decision, the student can complain to the Ministry of Education within two weeks after receiving the complaint, as far as legal issues are involved.

Rules about the examinations in which the student according to the Examination Order must have participated and passed prior to the end of

the 2nd semester, as well as rules about deadlines for completing the education as specified the Educational Order, will still apply.

11 Language

English is the language used in the international Computer Science programme. Skills in other languages are not required.

11.1 Examinations

Examinations are to be submitted/presented in understandable English or Danish.
Students with other native languages can seek exemption from the fact that formulation and spelling skills can influence the evaluation of the final examination project or any exam for which the Curriculum specifies that such skills are included in the evaluation. Application for exemption should be sent to the head of departmentat least four weeks prior to the examination.

12 Re-examinations

12.1 Re-examinations due to illness

A student who has not been able to sit an examination due to documented illness or other unforeseen circumstance is given the opportunity to sit a re-examination as quickly as possible. In the case of an examination taking place at the end of the last examination period, the student is given the opportunity to sit the examination in the same examination period or immediately thereafter.

This examination can be identical to the next ordinary examination. It is the student’s responsibility to investigate when the re-examination will be held.

Information about time and place for these re-examinations can be found on EASV SharePoint.

Illness must be documented by a medical certificate received by the institution three days at the latest after the examination has been conducted. A student who becomes acutely ill during an examination must document that he/she has been ill on the day in question.

If illness is not documented according to the above rules, the examination will count as one examination attempt spent by the student.

Any costs for the medical certificate are the responsibility of the student.

12.2 Re-examinations due to failing or non-attendance

By not passing or by not attending the examination, the student is automatically registered to sit the re- examination, provided that the student has not spent all three examination attempts. The re-examination can be identical with the next ordinary examination.

It is the student’s responsibility to investigate when the re-examination will be held. Information about time and place for these re-examinations can be found on EASV SharePoint.

Exemption from the above can be given in the case of extraordinary conditions, including documented disability.

13 Use of aids

Any rules for restrictions in the use of aids will be made clear in the specifications for the individual examination.

14 Special examination conditions

The student can apply for special examination conditions when warranted by physical or mental impairment. The application should be submitted to the head of departmentat least four weeks prior to the date of the examination. An exemption from this deadline can be given in the case of suddenly occurring health issues.

The application must be accompanied by a medical certificate, a statement from e.g. a body dealing with speech, hearing or sight impairment or dyslexia, or other forms of documentation certifying serious health issues or relevant functional impairment.

15 Cheating offences in exams

When submitting written material the student certifies by his/her signature that the material has been produced without undue assistance.

15.1 Using one's own work and that of others – plagiarism

Cheating in exams through plagiarism comprises instances where a written answer appears to be completely or partially produced personally by the student him-/herself, but:

- Comprises identical or almost identical rendering of the wording or work of others, without clearly identifying this using quotation marks, italics, indentation or other clear indications stating the source of the material, cf. the educational institution's requirements to written work on EASV SharePoint.
- Comprises major pieces of text with choice of words or formulations so close to that of another piece of writing that it is possible to determine through comparison that the text could not have been written without using the source in question
- Comprises the use of words or ideas of others without giving reference to the source in an appropriate manner
- Re-uses text and/or central ideas from the student's own previously assessed answers (self- plagiarism) without observing the provisions laid down in items 1 and 3 above.

15.2 Disciplinary procedures for cheating offences and disruptive behaviour during exams

A student who sits an exam and who beyond doubt during the exam

- Receives unauthorised help
- Helps another student answer a question in the exam
- Uses unauthorised materials and aid, or
- Exhibits disruptive behaviour

can be expelled from the exam by the head of department or whoever the head of department authorises to do so, or the examiners can agree to expel the student from the exam while it is taking place. In such cases

the justification of the action is to be evaluated in connection with the subsequent decision.

If the disruptive behaviour is of a less serious nature, the educational institution will initially issue a warning.

15.3 Presumed cheating at an exam, including plagiarism during and after the exam

If during or after an exam it is believed that a student

- Has received or given unauthorised help
- Has presented the work of another person as his/her own (plagiarism), or
- Has used his/her own previously assessed work or parts thereof without referring to it (plagiarism)

this will be reported to the head of the degree programme.

15.4 Investigation of cheating offences in exams, including plagiarism

Postponement of the exam

If the cheating offence concerns suspected plagiarism in a written report and/or answer that is to be used in the assessment of a subsequent oral exam, the head of department postpones the exam, unless the issue can be investigated prior to the date set for the exam.

Form and content of the report

Reporting must be made without undue delay. The report must be accompanied by a written description of the breach, containing information that can identify the individual(s)s reported on, as well as a brief summary of and documentation substantiating the case. In the event of repeated offences for one or more of the persons involved, this must be stated.

When reporting on plagiarism, the plagiarised parts must be marked with clear reference to the sources of plagiarism. Similarly, the plagiarised text must be marked in the source text.

Involving the student: hearing of the party/parties

The head of department decides whether the hearing of the student is to be oral, in writing, or a combination thereof.

For the oral hearing, the student is summoned to a clarifying interview, in which documentation substantiating the suspected cheating in the exam is presented to the student and in which the student is asked to present his/her point of view. The student has the right to be accompanied by a person of his/her own choice.

For the written hearing, the documentation substantiating the presumed cheating in the exam is sent to the student with a request for a written response to the accusation

15.5 Penalties for cheating offences and disruptive behaviour during exams

If clarification of the issue confirms the presumed cheating offence, and the action has influenced or would influence the exam assessment, the head of department will expel the student from the exam.

In less serious cases, a warning is first given.

In more serious cases, the head of department can expel the student for short or long periods of time. In such cases the student receives a written warning to the effect that repeated offences could lead to permanent expulsion.

Expulsion according to the above terms will lead to cancellation of any grade that may have been granted for the exam in question, and the exam will count as one attempt.

The student cannot sit a re-examination and cannot sit the exam again until an exam is scheduled on ordinary terms as part of the degree programme.

During the period of expulsion the student is not allowed to attend classes or sit exams.

15.6 Appeals

Decisions concerning expulsion due to a cheating offence at an exam, and that an attempt at an exam has been used, are final and cannot be appealed to a higher administrative authority.

Appeals concerning legal aspects (such as incapacity, hearings, appeal instructions, correct or incorrect interpretation of the Examination Order etc.) can be brought before the Danish Agency for Higher Education and Educational Support. The complaint is forwarded to the educational institution in question, for the attention of the head of the degree programme. The head makes a statement on which the appellant must be given an opportunity to comment, normally within one week. The educational institution forwards the appeal, the statement and any comments that the appellant may have made to the Danish Agency for Higher Education and Educational Support.

Appeals must reach the educational institution no later than two weeks from the day that the appellant was notified of the decision, cf. Section 51 of the Examination Order.

16 Complaints about examinations and appeal decisions

16.1 Complaints about exams

We recommend that the student ask the student counsellor for information about complaint procedures and guidance on how to prepare a complaint.

The rules governing complaints about exams can be found in Section 10 of the Examination Order. The Examination Order differentiates between two types of complaints:

- Complaints about the scope of the exam, the examination procedure itself and/or the assessment made
- Complaints about legal matters

These two types of complaints are dealt with differently.

16.1.1 Complaints about the scope of the exam, the exam procedure and/or the assessment

The examinee can submit a written and substantiated complaint within two weeks after the assessment of the exam has been communicated in the usual way. The complaint can cover:

- The scope of the examination, including questions asked, assignments, etc. as well the examinations relation to the objectives and requirements of the programme
- The examination procedure
- The assessment

Complaints may be submitted about all examinations – written, oral and combinations hereof, as well as practical exams.

Complaints are to be sent to the head of the degree programme.

The complaint is sent immediately to the original examiners, i.e. the internal examiner and the external examiner for the examination in question. Their statement of response forms the basis for the institution's decision regarding academic issues. Two weeks are normally allowed for this response.

As soon as the examiners' response is available, the student issuing the complaint is given an opportunity to comment on the statements, normally with a one-week deadline.

The institution makes its decision based on the academic opinion of the examiners and the complainant's comments hereto.

The decision is to be communicated in writing and can:

- Offer the possibility of a new assessment (re-assessment). This applies to written exams only.
- Offer the possibility of a new exam (re-examination) with new examiners, or
- Reject the complaint

If the decision is to offer a re-assessment or re-examination, the head of departmentappoints new examiners. Re-assessment applies only to written exams for which material is available, as the new examiners cannot make a (re-)assessment of an oral examination and because the notes made by the original examiners are personal and cannot be disclosed.

If the decision is to offer reassessment or re-examination, the complainant must be informed of the fact that the re-assessment or re-examination may lead to a lower grade.

The student must accept the offer within a period of two weeks after the decision has been communicated. Acceptance can thereafter not be cancelled. If the student does not accept the offer within this period of time, there will be no re-assessment or re-examination.

The re-assessment or re-examination must take place as quickly as possible.
In the case of re-assessment, all documentation shall be provided to the new examiners – the assignment, the answer, the complaint, the

evaluations made by the original examiners – together with the complainant's comments and the educational institute's decisions.

The new examiners notify the educational institution of the outcome of their re-assessment and enclose a written statement that specifies the assessment and the reasons for it. Re-assessments may result in a lower grade.

If the decision is to offer re-assessment or re-examination, the decision applies to all students whose examination suffers from the same defects as those referred to in the complaint. The complaint is sent to the head of department two weeks (14 calendar days) at the latest after the assessment of the exam concerned has been communicated. If the due date is on a public holiday, the due date will be the fist workday following the public holiday.

Exemption from this deadline can be given in the event of exceptional circumstances.

Appeals and complaints about appeal decisions
The complainant can submit the educational institution's decision to an appeals panel. The activities of the appeals panel are governed by the Public Administrations Act, which also incudes issues of incapacity and confidentiality.

The appeal is to be sent to the head of the degree programme.

The appeal must be submitted two weeks at the latest after the decision has been communicated to the student. The same requirements as above for complaints (in writing, stating reasons, etc.) also apply to appeals.

The appeals panel consists of two authorised external examiners appointed by the chairman of the external examiners, a lecturer authorised to conduct examinations, and a student studying the subject area (the degree programme), both of which are appointed by the head of the degree programme.

The appeals panel makes decisions based on the material used by the educational institution in making its decision and the student's appeal, with reasons stated.

The appeals panel can:
- Offer the possibility of a new assessment with new examiners. This applies to written exams only.
- Offer the possibility of a new exam with new examiners, or
- Reject the appeal

If the decision is to offer reassessment or re-examination, the complainant must be informed of the fact that the re-assessment or re-examination may lead to a lower grade.

The student must accept the offer within a period of two weeks after the decision has been communicated. Acceptance can thereafter not be cancelled. If the student does not accept the offer within this period of time, there will be no re-assessment or re-examination.

The re-assessment or re-examination must take place as quickly as possible.

In the case of re-assessment, all documentation shall be provided to the appeals panel – the assignment, the answer, the complaint, the evaluations made by the original examiners – together with the complainant's comments and the educational institute's decisions.

The appeals panel must make its decision two months at the latest (in the case of spring semester exams three months) after the submission of the appeal.

The decision of the appeals panel is final, which means that the case cannot be brought before a higher administrative authority as far as the academic part of the complaint is concerned.

16.1.2 Complaints about legal matters

Complaints about legal aspects of decisions made by examiners in connection with re-assessments or re- examinations or in connection with decisions made by the appeals panel can be brought before the educational institution. The deadline for submitting such complaints is two weeks from the day the decision has been communicated to the complainant.

Complaints about legal aspects of decisions made by the institution according to the rules laid down by the Examination Order (e.g. incapacity, hearings, correct or incorrect interpretation of the Examination Order) can be submitted to the educational institution. The institution issues a statement and the complainant is normally given one week in which to respond with his/her comments. The institution forwards the complaint, the statement and any comments the complainant may have to the Danish Agency for Higher Education and Educational Support.

Complaints must be submitted to the educational institution at the latest two weeks (14 calendar days) after the day on which the decision has been communicated to the complainant.

17 Exemptions

The institute can grant exemptions from rules in this institution-specific section of the Curriculum in cases where such exemption is justified due to exceptional circumstances. The institutions offering this education cooperate to ensure a uniform exemption practice.

18 Effective date and transition period

The institution-specific section of the Curriculum is effective from 1 September 2015 and applies to all students who initiate their studies at EASV by 1 September 2015 or later.
Current students at the Academy will complete their studies according to the Curriculum valid at the initiation of their studies.

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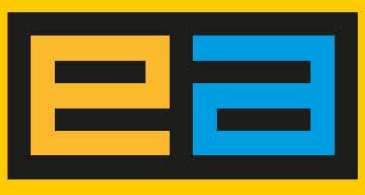

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