

Curriculum

for

**Academy Profession Degree in Computer
Science**

2008 – 2009

THE BUSINESS ACADEMY South West

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1 The Academy Profession Degree in Computer Science

1.1 Introduction

The Academy Profession Degree in Computer Science is a practice-oriented, full-time educational 2,5-year programme offering a combination of IT-disciplines and business modules. The programme is based on the Datamatiker Programme established in Denmark in 1986 to meet the demands from the business sector for improved theoretical knowledge and a broad practical profile within information technology.

Over the years this short-cycle advanced computer programme has been constantly updated to meet the ambitious professional and business related needs. The overall objectives require a well-planned and organisationally coherent curriculum providing students with time for independent achievement and professional concentration.

The curriculum is based on three general perspectives, i.e. overall orientation, problem oriented project teaching and management orientation.

The holistic approach is achieved by having relatively few but comprehensive modules and by using interdisciplinary assessment forms. It is important to stress that the teachers collaborate on organising the tuition and planning projects and examinations in the second and fourth semesters.

The basis for the curriculum is:

- 1 Order no. 623 June 28, 2004, issued by the Danish Ministry of Education on the Academy Profession Degree in Computer Sciences.
- 2 Order no. 1021 of November, 2000, on Examinations at certain further educations.

2 Course Structure

The duration of the course is 2 years and 6 months incl. examinations. The table below shows how modules are placed during the educational course:

1. semester	2. semester	3. semester	4. semester	5. semester
Software-construction 25 ECTS	Computer Architecture and Operative Systems 10 ECTS	Computer Network and Distributed Systems 10 ECTS	Specialisation 20 ECTS	Traineeship 15 ECTS
Information Technology in Organisations 15 ECTS		Software Architecture and Distributed Programming 15 ECTS		
Software Design 10 ECTS		System Development Methods 15 ECTS		Main project 15 ECTS

The programme consists of a common part of 150 ECTS

The common part is divided into four subject areas:

- The business enterprise** – e.g. financial management, organisation and environmental management
- Systems development** – e.g. analysis, design, project management and computer tools
- Programming** – e.g. algorithms and data structures, programming languages and database programming
- Technology** – e.g. safety, computer architecture, distributed systems and network.

The individual part consists of the elective modules of the 4th semester and the diploma project module of the 5th semester.

3 Main Themes

Main theme of the 1st and 2nd semesters is the development of computerised systems in a business-oriented perspective, with progression as to extent a technical complexity.

The fundamental theme of the 3rd and 4th semester is distributed systems. Network and Distributed Systems, System Development and Methodologies and Distributed Programming are integrated through a joint project with

project guidance as a teaching method.

4th semester gives the opportunity of specialisation.

In the 5th semester the student develops a Diploma Project in co-operation with a company. The starting point is a specific assignment set by the company.

3.1 ECTS Credits

The course provides a total of 150 ECTS points in the European Credit Transfer System

	ECTS Credits
Compulsory subjects:	
• Software Construction	25
• Software Design	10
• IT in Business Organisations	15
• Computer Architectures and Operating Systems	10
• Software Architectures and Distributed Programmes	15
• Computer Network and Distributed Systems	10
• Systems Development Methodologies	15
Specialised part:	
• Elective Modules	20
• Main project	15
	Total 150

It is a full-time course and the student must expect a workload corresponding to a normal full-time job, i.e. approx. 840 hours per semester excluding holidays. The student's workload is on the average a minimum of 47 hours a week.

3.2 Methodology

Depending on the subject, the teaching methodology varies considerably, i.e. from classic classroom teaching, open discussions, seminars, problem-solving sessions, theoretical exercises, practical lab work (with the lecturer as tutor), and group work on to larger project work with individual counselling. A teachers' team is attached to each group of students.

The exams vary from individual written/oral exams to project exams where the groups present and discuss their project.

4 Subjects

4.1 Software Construction

Term	Year 1, Semester 1 + 2, Spring/Fall
Pre-requisites	None
ECTS Credit Points	25
Teaching/Learning	Lectures, cases, projects and interactive classroom tutorials
Student Workload:	

Aim

The aim of the subject is to qualify the student to efficiently be able to implement systems with relevant qualities. Software Construction has close relations to the subjects Software Design and Computer Architectures and Operating Systems.

Indicative Contents

General:

Mathematics

Programming: Algorithms Templates and techniques Programming language theory Data structures and abstract data types Programming language Programme quality Programming for Database Systems Quality of Programs and Reusability

Assessment

A joint project examination for the essential of the subjects of year 1.

4.2 Software Design

Term	Year 1, Semester 1 + 2, Spring/Fall
Pre-requisites	None
ECTS Credit Points	10

Teaching/Learning	Lectures, cases, projects and interactive classroom tutorials
Student Workload:	

Aim

The aim of the subject is to qualify the student to keep up with the latest developments and integration of IT-systems of different types on systematic basis by using a specific modern method and attached systems development tools. The student should be able to secure that the proper IT-systems with relevant qualities will be developed efficiently and ties the other subjects of the 1st year together.

Indicative Contents

General: Communication Development of technology

Systems development: Modelling Method Pre-Analysis Analysis Design Project work Computer based tools Experiments System quality

Assessment

A joint project examination for the essential of the subjects of year 1.

4.3 IT in Business Organisations

Term	Year 1, Semester 1 + 2, Spring/Fall
Pre-requisites	None
ECTS Credit Points	15
Teaching/Learning	Lectures, cases, projects and interactive classroom tutorials
Student Workload:	

Aim

The aim of the subject is to qualify the student to involve relevant business aspects and business agreement in connection with systems development. The subject area should qualify the student to work in a systems development organization and participate in the latest development and integration of IT-systems of different types of organizations.

Indicative Contents

The Business: Organisation and IT security IT-Development/-investment Frame systems for Business Management Business strategies

Assessment

A joint project examination for the essential of the subjects of year 1.

4.4 Computer Architecture and Operating Systems

Term	Year 1, Semester 2, Spring/Fall
Pre-requisites	None
ECTS Credit Points	10
Teaching/Learning	Lectures, cases and interactive classroom tutorials
Student Workload:	

Aim

The aim of the subject is to qualify the student to be able to contribute to the selection and use of technology in connection with systems development and programming of IT-systems. And give the student a basic knowledge of technological aspects.

Indicative Contents

In general: Mathematics Technological Development

Technology: Storage Management Databases Processes Computer Architecture

Assessment

Joint project examination with essential subjects from year 1.

4.5 Software Architectures and Distributed Programmes

Term	Year 2, Semester 3, Spring/Fall
Pre-requisites	Software Construction
ECTS Credit Points	15

Teaching/Learning	Lectures, cases, projects and interactive classroom tutorials
Student Workload:	

Aim

The aim of the subject is to qualify the student to implement distributed systems with relevant qualities. The subject is a central qualification and has close relations to the other compulsory subjects of the 2nd year.

Indicative Contents

Programming: Algorithms Data structures Programming Language Distributed Programming Concurrent Programming Language Theory Data structures and abstract data types Software Architecture

Systems Development:
Design

Technology: Processes Computer Architecture Distributed Systems

Assessment

Oral Exam

4.6 Computer Network and Distributed Systems

Term	Year 2, Semester 3, Spring/Fall
Pre-requisites	Computer Architectures and Operating Systems
ECTS Credit Points	10
Teaching/Learning	Lectures, cases, projects and interactive classroom tutorials
Student Workload:	

Aim

The aim of the subject is to qualify the student to be able to contribute to the selection and use of technology in connection with systems development and programming of distributed IT-systems and give the student a basic knowledge of technological aspects.

Indicative Contents

In general: Mathematics Technological Development

The Company: Investment in
Technology

Technology: Security Processes Computer Architecture Distributed Systems Networks Standard Servers
Databases

Assessment

Oral exam after 3rd semester

4.7 Systems Development Methodologies

Term	Year 2, Semester 3 + 4, Spring/Fall
Pre-requisites	Software Design
ECTS Credit Points	15
Teaching/Learning	Lectures, cases, projects and interactive classroom tutorials
Student Workload:	

Aim

The aim of the subject is to qualify the student to keep up with the latest developments and integration of IT-systems of different types on a systematic basis by using a specific modern method and systems development tools. The student should be able to secure that the proper IT-systems with relevant qualities will be developed efficiently and ties the other subjects of the 2nd year together.

Indicative Contents

In general:
Innovation

Systems development: Systems development methods Project Work Computer based tools Prototyping Modelling

The Company:
Strategies

Assessment

Joint project examination with essential subjects of Systems Development.

4.8 Elective Modules

Term	Year 2, Semester 4, Spring/Fall
Pre-requisites	Semesters 1, 2 and 3
ECTS Credit Points	20
Teaching/Learning	Lectures, cases, projects and interactive classroom tutorials
Student Workload:	

Aim

The aim of the subject is to give the student a possibility to gain an individual profile specialising in a subject which broadly relates to the subject areas of the Academy Profession Degree in Computer Science, thus demonstrating that he/she can apply technology, theory, methods, areas of applied IT, new trends, etc.

Objectives

- 1 The student is able to work in a theoretical and methodical way with the chosen subject
- 2 The student is able to evaluate, argue for, reason about and in a critical way put into perspective the development within the specific area covered by the chosen subject
- 3 The student is capable of using and evaluating techniques, tools and models related to the chosen subject
- 4 The student is able to individually search for, find, evaluate and study literature of relevance to the subject

Indicative Contents

In general:

A number of modules are offered at the beginning of each semester. The contents and the names of the modules change at the same speed as the development within the IT- sector. Examples of the modules to choose from are:

- Wireless and PDA
- Cisco CCNA
- IT security
- .Net and C#
- Microsoft Certifications

5 Main project Aim

That the student, in completion of the Academy Profession Degree in Computer Science, gets the possibility of preparing a complex problem as a solution to a concrete task within the field of computers in co-operation with a company

Objective

That the student, in writing as well as orally, can document the capability of carrying out a solution to a problem, analytically and systematically, and combine theory and practice in a broad coherent, professional perspective.

6 Assessment Plan

The Academy Profession Degree in Computer Science provides seven examinations and one Diploma project examination. These examinations are distributed throughout the course by applying different tests adapted to the forms and contents of the modules in question.

The student has to take the following examinations:

After year 1:

- A joint project examination for the essential of the subjects of year 1.

After 3rd Semester:

- Oral examination in the Programming subject area and the subject Computer Networks and Distributed Systems

After 4th Semester:

- Joint project examination in Systems Development subject area.
- Examination in the student's optional subject.

After 5th Semester:

- Diploma Project examination.

Ordinary examinations are held each year in January and June. Diploma Project examinations take place in April and in November. Supplementary examinations due to e.g. illness are held in January/February and August each year.

Examinations may be changed in accordance with college regulations.

7 Types of Examination

If an assignment implies that the student should design a usable programme, the documentation necessary for testing this programme should be enclosed in a form that is machine-readable. This documentation must comply with specific guidelines. Furthermore, the student might be asked to demonstrate the programme to a teacher.

7.1 Project Examination

The project examination may include a group of usually three students. The examination is based on a project developed by the student, and the bibliographies of the students accepted by the teachers.

To take part in the project examination the student must have handed in a written project and a bibliography accepted by the counsellor in accordance with the guidelines of the school.

The project is evaluated holistically based on the objectives of the subject. It is not demanded that all topics of the module are covered in the project, but the individual examination may include all titles of the bibliography, which should cover the subject.

One mark is given to each student based on an overall evaluation of the project, the presentation and the individual examination.

If the student does not obtain the mark 6, he or she may take a new examination on the same topic and the same bibliography as previously. The student may choose whether the project should be included completely or partly as a basis of the new examination.

7.2 Oral Examination

The oral examination is individual on the basis of one question, which the student draws in connection with the examination. The question included in the examination must cover the subject or the subjects in a broad sense. Each student must be able to choose between at least four examination questions.

The examination is conducted as a conversation between the student, the examiner and the external examiner.

One mark is given based on an overall evaluation of the student's performance compared with the objective of the subject.

7.3 Written Examination

The written examination is individual and is based on examination papers elaborated by the school. The examination takes four hours and all written materials are allowed.

One mark is given, based on an overall assessment of the student's performance compared with the objective of the subject.

7.4 Elective Module Examination

Elective exams consist of an individual oral exam of 30 minutes' duration.

The point of departure is the elective coursework, which may be performed by an individual or by two students. The examination takes the form of a presentation of a selected subject within the coursework area followed by a dialogue on the basis of the presentation – however, other elective modules may be used for the dialogue if relevant.

The coursework documentation or synopsis has the purpose of describing briefly and precisely what the student has been engaged in during the coursework. The documentation performed is not part of the basis for evaluation, but solely functions as an orientation giving the examiner and the external examiner an impression of the work performed.