Curriculum part 3 - 2014

Elective Elements AP Degree in Computer Science

Datamatikeruddannelsen

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1.   Elective Elements

In the 4th semester, the programme offers a number of elective elements that are composed so that together they account for 30 ECTS.

The purpose of the elective elements is to offer students the opportunity of an individual study profile through academic immersion. The electives can be planned by the individual institution offering the programme. Students may also follow electives at other institutions provided that they pay for their own transportation, overnight accommodation, etc.

To be able to continually offer current electives, the choice of electives is changed regularly. All new electives are regularly uploaded on fronter.

2.   Programming Languages

Extent: 10 ECTS

Contents
This module will qualify the student to learn and evaluate new programming languages based on his or hers previous knowledge. The student will see new and old concepts, to understand how programming languages have been and will be developed.

The module will cover three programming languages. In the autumn semester of 2014 this will be C, C++ and a programming language that will be chosen by the students. This could be e.g. Javascript, Python, Go, Ruby, ML, F#.

Learning objectives

Knowledge and understanding
The student will gain knowledge about:

- Concepts in historical programming languages
- Concepts in modern programming languages
- How programming languages have evolved

Skills
The student will get the skills to:

- Read and write short programmes in the programming languages covered
- Evaluate concepts in programming languages for efficiency, readability, security and maintenance

Competencies
The student will learn to:

- Learn new programming languages
- Choose a programming language for an assignment

3.   .NET and C#

Extent: 10 ECTS

Contents
The purpose of this course is to enable the student to develop .NET applications in the C# language using the Visual Studio IDE, and to provide the student with knowledge of the most important parts of the .NET framework.

Learning objectives

Knowledge and understanding
The student will gain knowledge about:

- The C# language and its features
- ADO.NET and the Entity Framework
- Windows applications using WPF
- Web applications using Webforms and the MVC framework
- WCF (the communications framework)

Skills
The student will get the skills to:

- Program Windows applications using WPF
- Program Web applications using ASP.NET and MVC
- Use .NET's database features to access databases
- Use .NET's thread features to program applications with multiple threads

Competencies
The student will learn to:

- Develop Windows applications in C# using .NET
- Develop Web applications using .NET
- Use the .NET framework

Examination
This course is examined as part of the Specialisation exam. The Specialisation exam consists of a course work resulting in one project report containing parts from all the student's elective courses. The course work is an individual task for each student, resulting in a grade from the 7-point grading scale.

4.   iOS Programming for Java Programmers

Extent: 10 ECTS

Contents
The purpose of this module is to qualify the student to be able to use the programming language swift, use the framework cocoa touch and code in the ide Xcode. The student will after the module be able to (1)program apps for the iPhone and the iPad (2) use design patterns according to the specs in the cocoa touch framework and last (3) be able to use different hardware related libraries to communicate with the devices gos, gyro camera etc.

Learning objectives

Knowledge and understanding
The student will gain knowledge about:

- The language SWIFT
- Cocoa Touch Framework
- MVC designpattern
- Segues
- CoreData database layer
- GUI, events, delegates
- Validating of input, regular expressions
- Automatic testing
- Threads
- Deployment and installation
- Blocks

Skills
The student will get the skills to:

- Design and program apps for iOS devices with graphical user elements
- Apply patterns to support efficient and agile integration with the underlying
- Use JSON and webservices
- Use underlying databases
- Test and debug applications

Competencies
The student will learn to:

- Work with and choose between different development environments and languages
- Choose between different technologies for selecting the correct persistence layer
- Evaluate the need for different graphical user interfaces
- Acquire knowledge about the development and standards on the iOS platform

Examination
Project