Curriculum for the Master of Science Programme in Information Technology at the IT University of Copenhagen, Software Development

Curriculum of 1 June 2015

Content

Background

Background

This curriculum for the Master of Science Programme in Information Technology, Software Development, has been drawn up by the Board of Studies ITU at the IT University of Copenhagen (henceforth referred to as the IT University).The curriculum has been drawn up in compliance with the current legislation governing bachelor's and master's (Candidatus) programmes at the universities.

Students enrolled in the above MSc study programmes with study start from autumn of 2015 study according to this curriculum.

Chapter 1

Programme Title and Objectives

Programme Title

Section 1. A student, who has completed the programme, has the right to use the title candidatus/candidate informationis technologiae (cand.it.) i softwareudvikling.

Subsection 2. The title in English is Master of Science (MSc) in Information Technology, Software Development.

Programme Objectives

Section 2. The purpose of the Master of Science Programme in Information Technology is to provide students with the scientific qualifications to identify, formulate, solve and reflect on complex problems relating to information technology.

Subsection 2. The programme prioritises the student's ability to assess, apply and develop the underlying technology as well as the scientific theories, methods and tools upon which it is based.

Subsection 3. The student must have the ability to independently initiate and carry out collaborative work in professional and multidisciplinary settings. Furthermore, the student must have the ability to engage in global and distributed interaction, drawing on research-based perspectives.

Subsection 4. On the background of the student's preceding bachelor's programme, the programme provides the student with the qualifications to define his or her own academic profile within the field of information technology and to take independent responsibility for his or her own professional development and specialisation.

Subsection 5. Within the framework of the programme, the student can acquire the requisite individual qualifications for specialised posts in business and industry as well as for research training programmes (PhD programme) in information technology.

Objectives for Learning Output

Section 3 The graduate will develop *knowledge and understanding of*:

- general concepts of programming languages
- analysis of software performance in theory and practice
- principles of software design, modelling and software architecture

Each graduate obtains specialised knowledge at international research level in at least one of the above areas, depending on the selected specialisation module.

Subsection 2. The graduate will develop the following *skills*:

- The graduate can use a modern programming platform to implement software.
- The graduate can manage, plan and participate in fundamental processes and practices of software development, such as requirements analysis, architecting, implementing, tuning, validating and documenting software.
- The graduate can follow good practice in quality assurance to create reliable and secure software.

Subsection 3. The graduate will develop the following *competences*:

- The graduate can write well-documented software that meets customer requirements.
- The graduate can collaborate with others in complex and changing contexts, for example in international and industrial projects, using processes, methods and tools that support such collaboration to design and develop high-quality software.

Subsection 4. Additional track specific *competences* for graduates are:

Design track:

- The graduate can exploit their non-software domain knowledge (obtained during their undergraduate studies) with newly obtained software development expertise to design domain-specific application software.
- The graduate can work with customers, end-users and other business stakeholders on designing and developing software solutions meeting the business requirements.

Advanced Computing track:

- The graduate can evaluate, customize, design and develop software tools and technologies.
- The graduate can apply, adapt and evaluate software development methods.

Chapter 2

Programme Structure, Content and Programme Language

Programme Structure

Section 4. The Master of Science programme requires passes in study activities corresponding to 120 ECTS points consisting of a mandatory backbone, a specialization, optional modules and a master's thesis.

Subsection 2. The study activities of the programme are composed of modules corresponding to 90 ECTS points and a concluding master's thesis corresponding to 30 ECTS points.

Subsection 3. Graphic overview of the Design track and Advanced Computing track programme structure is found at the IT University's online Study Guide.

Programme Content

Section 5. The mandatory backbone of the MSc study programme Software Development and Technology, the *Design track*, consists of modules corresponding to 45 ECTS points within the first three terms.

Subsection 2. The specialization of the MSc study programme consists of modules corresponding of 22.5 ECTS points within the first three terms.

Subsection 3. The optional modules of the MSc study programme correspond to 22.5 ECTS points within the first three terms.

Subsection 4. The mandatory backbone of the *Design track* consists of the following three modules:

1. Programming (22.5 ECTS)
The module focuses on introductory programming concepts and practical experience, including imperative object-oriented programming and introductory database design.

2. Foundations (15 ECTS)
The module focuses on the foundations of software development, such as algorithms, data structures and discrete mathematics.

3. Software Engineering (7.5 ECTS)
The module focuses on software development methods for assuring quality.

Section 6. The mandatory backbone of the MSc study programme Software Development and Technology, the *Advanced Computing track*, consists of modules corresponding to 30 ECTS points within in the first two terms.

Subsection 2. The specialisation of the MSc study programme consists of modules corresponding to 22.5 ECTS points within the first 3 terms.

Subsection 3. The optional modules of the MSc study programme correspond to 37.5 ECTS points within the first three terms.

Subsection 4. The mandatory backbone of the Advanced Computing track consists of the following module:

1. Software Design (30 ECTS)
The module focuses on advanced techniques and methods for designing and implementing drawn from both computer science and software engineering research, for example model-driven development, problem solution techniques, programming languages, project organization and software architecture.

Programme Language

Section 7. The MSc Software Development study programme is conducted in English.

Chapter 3

General Rules and Miscellaneous Regulation

Section 8. Furthermore, please refer to the IT University's rules and regulation, appendix to this curriculum.

Chapter 4

Date of Commencement and Transitional Regulations

Section 9. This curriculum comes into force 1 September 2015 and applies to all students admitted to the programme from autumn 2015.

Subsection 2. Students, who are enrolled under previous curriculums, may apply to the Board of Studies ITU to complete the programme under the present curriculum if this can be done within a maximum of 120 ECTS point.

Subsection 3. When a new curriculum is published, or in the event of significant changes to this curriculum, transitional regulations will be set out in the curriculum as appendix.

Approved by the Board of Studies ITU 12 June 2015

Approved by Vice Chancellor Mads Tofte 19 August 2015