

## **Curriculum for the Master of Science Programme in Computer Science at the IT University of Copenhagen**

Curriculum of 1 August 2018

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### **Background**

This curriculum for the Master of Science Programme in Computer Science, has been drawn up by the Board of Studies 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 2018 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/candidata scientiarum (cand.scient.) i datalogi.

*Subsection 2.* The title in English is Master of Science (MSc) in Computer Science.

### *Programme Objectives*

**Section 2.** The purpose of this programme is to provide students with the scientific qualifications to identify, formulate, solve and reflect on complex problems relating to computer science.

*Subsection 2.* The programme prioritises the student's ability to assess, apply and develop the underlying technology and 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 computer science 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, industry, the public sector, and for research training programmes (PhD programme) in computer science.

### *Objectives for Learning Output*

**Section 3** The graduate will develop research based *knowledge and understanding of, and will be able to reflect on:*

- concepts of programming languages
- analysis of software performance and correctness in theory and practice
- principles of software design and modelling and its applications to real-world scenarios
- principles of software security

Each graduate obtains specialised knowledge and understanding at highest international research level in the selected specialisation area.

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

- The graduate can master a modern programming platform to implement software.
- The graduate can use, assess and develop fundamental processes and practices of software development, such as requirements analysis, architecting, implementing, tuning, validating and documenting software.
- The graduate is able to communicate and discuss the acquired knowledge with both academic peers and non-specialists.

Each graduate obtains specialised skills at highest international research level in the selected specialisation area.

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

- The graduate can evaluate and customise software tools and technologies that are complex and unpredictable, and design and develop new solutions.
- The graduate can independently initiate and implement collaboration with others in complex, inter-disciplinary and changing contexts, for example, in international and industrial projects.
- The graduate can independently take responsibility for own professional development and specialisation.

Each graduate obtains specialised competences at highest international research level in the selected specialisation area.

## 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 comprising a mandatory backbone, specialisation modules, 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.* A visualisation of the programme structure is available at the IT University's online Study Guide.

#### *Programme Content*

**Section 5.** The mandatory backbone of the MSc study programme in Computer Science consists of modules corresponding to 45 ECTS points within the first three terms.

The content of the mandatory backbone focuses on advanced techniques and methods for designing, implementing, and maintaining software, drawn from both computer science and software engineering research. In detail, modules contain techniques for designing and implementing efficient and correct software for modern IT systems, including concurrent and parallel software, aspects of information security, advanced features of programming languages, and project organisation in heterogeneous working environments.

*Subsection 2.* The choice of a specialisation is mandatory. A specialisation comprises modules corresponding to 22.5 ECTS points within the second and the third term.

*Subsection 3.* The optional modules comprises 22.5 ECTS points within the second term.

#### *Programme Language*

**Section 7.** The MSc Computer Science 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 2018 and applies to all students admitted to the programme from autumn 2018.

*Subsection 2.* 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 24 August 2017

Approved by Vice Chancellor Mads Tofte 2 January 2018

