



The MSc Programme in Computer Science

The Department of Computer Science at the University of Copenhagen was established 1970 and represents more than 40 years of research and education in Information Technology and Computer Science. The MSc in Computer Science offers you a comprehensive education in both theoretical and practical Computer Science.



There are many good reasons why you should study Computer Science in Copenhagen – such as the research based teaching, the highly international atmosphere and the challenging study environment. Almost 30% of our MSc students are international – as the programme is part of the KU COME initiative. Moreover, the Department holds a solid position in international academic ranking lists – and offers very good career possibilities to our graduates whether in industry or research.

You will obtain proficiency in basic computer science subjects and get the opportunity to become part of the Department's research environment, working with topics such as domain specific programming language, medical imaging, game development or design of new user interfaces. You may consider to continue as a PhD student within one of the Department's three research groups or at another top level university.



The Copenhagen Master of Excellence Programme (COME)

Computer Science has been included as one of 8 specially designated master educations under the Copenhagen Master of Excellence Programme (COME) emphasis on:

- High quality in teaching, all teachers are certified in English
- Broad recruitment nationally and internationally
- Clear profiles of the various specialisations designed for various career paths.



Course Content

The Master Programme in Computer Science contains 4 compulsory courses common to all competence profiles as well as a number of optional courses and elements. The compulsory course elements are:

- 1) Advanced Programming
- 2) Principles of Computer Systems Design
- 3) Statistical Methods for Machine Learning, and
- 4) Advanced Algorithms and Data Structures.

Career Prospects and Competence Profiles

To facilitate the students' choice of specialisations within the master programme and to match their career expectations, the concept of **competence profiles** has been introduced.

By 2011/2012 the programme is composed of one general and six specialised profiles:

1. General Computer Science (GCS) (common to all)
2. Software Development (SD)
3. Programming Languages and Systems (PLS)
4. Computational and Mathematical Modelling (CMM)
5. Computer Science Innovation (CSI)
6. Digital Interactive Entertainment (DIE)
7. Algorithms and data structures (ADS)



Competence profiles offered by the Department of Computer Science



1. General computer science (GCS) (common to all students)

Graduates in general computer science can combine relevant knowledge of computer science to analyze a problem and evaluate previous attempts of solving the specific problem and related problems.

2. Software Development (SD)

Graduates with a competence profile in SD will have fundamental competencies in respect to software development, i.e. the various activities involved in preparing the production of software and information systems that are effective, useful and satisfactory for their users - both in the context of an organization and in the context of day-to-day life. Software development covers investigation of new needs in collaboration with users, software development, modification and reuse of software components, maintenance of systems and the technical and, especially, the organisational implementation of new software products and information systems.



3. Programming Languages and Systems (PLS)

Graduates with a PLS competence profile have knowledge of fundamental models of computing, their expressiveness and limitations, and how to capture them as (fundamental) programming languages. They learn how to implement programming languages efficiently on modern computer architectures, how to express their semantics with mathematical precision, and how to operationalize logical and mathematical methods to process programs for various purposes with safe and predictable results.



4. Computational and Mathematical Modelling (CSM)

This specialisation is focused on problems and applications with a foundation in measured observations or laws of Nature. For instance, measurements obtained from images, movies, medical data, satellites, motion capture data and models such as Newtonian mechanics etc. Mathematical and computational modelling of natural phenomena are most often data driven or method driven work processes. The students master both.



5. Computer Science Innovation (CSI)

Candidates with a CSI profile will have the ability to combine theory with practice / business (from research to invoice), and will obtain practical experience with entrepreneurship achieved through accomplishment of a business project. Examples of practical courses: IPR rights, Accounting and bookkeeping, Microeconomics, Marketing and Sales, "Pitching", Project presentation technique, Understanding of funding, Innovation Processes.

6. Digital Interactive Entertainment (DIE)

Digital interactive entertainment is about creating interactive applications for end-users or creating the tools (middle-ware/engines) for creating the interactive applications. Good programming skills, good ability to work together, and the ability to find creative solutions that work are at the core of the specialization.



6. Algorithms and Data Structures (ADS)

Graduates with this profile will have extensive and in-depth knowledge of fundamental algorithms, approximation algorithms, heuristics and data structures applicable to a wide range of computational problems. They will be able to argue about the correctness and complexity of algorithms. They will become familiar with general algorithmic paradigms and they will be able to apply various types of data structures to new problems. Graduates with this profile will be able to participate in software development projects. They will be able to present their results in accordance with requirements for publications in international journals.

Further information

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