Competence Profile

MSc in Computer Science and Engineering

A graduate from the Technical University of Denmark (DTU) has a research-based education at a high technological level that qualifies the graduate to take on specialized business functions and participate in scientific development. The MSc in Engineering degree also gives access to further education within research, in particular a PhD study.

The infrastructure of modern society is based on information technology. IT forms an integral part of our everyday lives and today no enterprise is possible without computers and communication equipment. The program in Computer Science and Engineering considers the design and use of computing components, software or hardware, to solve technical problems in an efficient and competitive way. The program focuses on understanding and selecting abstractions that make the development of IT solutions from current and future components possible. MSc graduates can model, analyze, design, implement and validate complex IT systems based on theoretically and technologically well-founded methods, tools and techniques. They typically find employment in a very broad range of companies and organizations in the area of IT, electronics and communications.

The aim of the Computer Science and Engineering program is to educate highly qualified engineers capable of developing complex computer systems. The disciplines of computer science, computer engineering, mathematics, logic, systems engineering and project management are central to the program.

The program offers great freedom of choice while the MSc thesis provides in-depth knowledge of a particular area of Computer Science and Engineering, enabling the graduate to provide solutions to complicated problems involving information technology.

The graduate

KNOWLEDGE ("Viden")

- has general knowledge of key aspects of computer science and engineering (02205, 02220, 02223, 02239, 02242, 02249, 02285, 02291, Thesis)
- has extensive technological expertise within a specific area and knowledge of current trends and opportunities within this area (02205, 02220, 02223, 02239, 02242, 02249, 02285, 02291, Thesis)
- has a solid understanding of teamwork processes in relation to computer-based solutions (02205, 02220, 02223, 02239, 02242, 02249, 02285, 02291)

SKILLS ("Færdigheder")

- has a clear professional profile which includes elements of current research at an international level, and has the ability to use this knowledge in developing new ideas and solving problems (02220, 02223, 02239, 02242, 02249, 02285, 02291, Thesis)
- has the ability to apply obtained basic qualifications on modelling and abstraction, on one or more professional areas (02205, 02220, 02223, 02239, 02242, 02249, 02285, 02291, Thesis)
- is experienced in abstract mathematical thinking and can apply theory to solve practical problems (02220, 02239, 02242, 02249, 02285, 02291, Thesis)
- has the ability to combine technological expertise with knowledge of economics, management, organization and project work, and is able to examine technological problems and solutions in a business and societal perspective (02205, 42435, 42490)
- is proficient in both oral and written communication, and is able to present professional results in a convincing manner (02220, 02223, 02239, 02242, 02249, 02285, 02291, 42435, 42490, Thesis)
- can identify and evaluate a relevant business idea or challenge using appropriate technical, legal or economic notions and tools, while taking present and future technologies into consideration (42435, 42490)

COMPETENCE ("Kompetence")

- has the ability to assess and delimit complex issues, put them into a broad professional context, and, on this basis, propose relevant courses of action (02220, 02223, 02239, 02242, 02249, 02285, 02291, 42490, Thesis)
- has a thorough understanding of how elements of a technological problem interact and is able to develop relevant models, systems and processes to solve the problem in question using creative analysis and modelling (02220, 02223, 02239, 02249, 02285, 02291, Thesis)
- commands problem solving at a high level, primarily through project-related approaches, and is able to handle all phases of a project, including the drafting of project timelines, design and solution proposals, and documentation (02285, 42435, Thesis)
- can use and assess technological solutions, while applying principles of ethics and sustainability where appropriate (02205, 02220, 02223, 02239, 02242, 02249, 02285, 02291, Thesis)
- can analyze, model and communicate complex IT-related situations in a comprehensible way by using notations at the right level of abstraction (02205, 02220, 02223, 02239, 02242, 02249, 02285, 02291, 42490, Thesis)
- can design, implement and optimize computer systems that are subject to different constraints, for example, restrictions on the use of time, memory, energy and other resources (02205, 02220, 02223, 02239, 02242, 02249, 02285, Thesis)
- can apply methods for dealing with complexity in computer science and engineering, such as abstraction, simulation and verification, and is conversant with a variety of computational models and techniques (02205, 02223, 02239, 02242, 02249, 02285, 02291, Thesis)
- can use existing and emerging hardware or software technologies to create IT solutions and improve such technologies (02239, 02242, 02249, 02285, Thesis)