Competence profile for MSc in Computer Science and Engineering

Competence Profile (MSc)

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. A master's degree in Engineering also gives access to further education within research (e.g. research positions or a PhD).

General competences (MSc)

An MSc from DTU

- has a solid understanding of and a firm base of knowledge in natural sciences and technological principles, possesses comprehensive knowledge within a given subject area, and is familiar with the current development trends and opportunities within the academic area
- can identify and reflect on technical scientific issues and understand the interaction between the various components of an issue
- can, based on a clear academic profile, apply elements of current research at international level to develop ideas and solve problems
- has insight into and understanding of the internal interaction between the various engineering domains and other competencies in connection with solving specific engineering problems
- possesses knowledge about sustainability, innovation and entrepreneurship
- masters technical scientific methodologies, theories and tools, and has the capacity to take a holistic view of and delimit a complex, open issue, put it into a broader academic and societal perspective and, on this basis, propose a variety of possible actions
- can, via analysis and modelling, develop relevant models, systems and processes for solving technological problems
- can communicate and mediate research-based knowledge both orally and in writing
- can discuss technological issues with various types of stakeholder
- is familiar with and can seek out leading international research within his/her specialist area
- masters technical problem-solving at a high level through project work, and has the capacity to work with and manage all phases of a project — including preparation of timetables, design, solution and documentation
- can work independently and reflect on own learning, academic development and specialization
- can independently combine his/her technological knowledge with knowledge about business, management, organization and project work
PROFESSIONAL COMPETENCE OBJECTIVES (MSc)
The MSc program in Computer Science and Engineering

The graduate

- has general knowledge of key aspects of computer science and engineering
- has extensive technological expertise within a specific area and knowledge of current trends and opportunities within this area
- has a solid understanding of teamwork processes in relation to computer-based solutions
- 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
- the ability to apply obtained basic qualifications on modelling and abstraction, on one or more professional areas
- is experienced in abstract mathematical thinking and can apply theory to solve practical problems
- 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
- is proficient in both oral and written communication, and is able to present professional results in a convincing manner
- 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
- can use and assess technological solutions, while applying principles of ethics and sustainability where appropriate
- can analyze, model and communicate complex IT related situations in a comprehensible way by using notations at the right level of abstraction
- 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
- 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
- can use existing and emerging hardware or software technologies to create IT solutions and improve such technologies
- 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
- 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
- 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
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- can analyze, model and communicate complex IT related situations in a comprehensible way by using notations at the right level of abstraction
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Facts about DTU

The Technical University of Denmark (DTU) is one of the largest Northern European research and education institutions in the engineering field. DTU educates more than 750 Masters and 300 Bachelors of Engineering and 150 PhDs a year. On January 2007 DTU merged with 5 sectorial research institutions becoming a broad-based technical university and center of excellence. The university has more than 6,000 students and over 4100 employees. DTU offers a 3½-year business-oriented Bachelor of Engineering, a 3-year Bachelor of Science in Engineering and a 2-year Master of Science in Engineering, MSc Eng. DTU also offers a 2-year Master of Science and Technology (MSc Techn) for Bachelors of Science and a Bachelor and Master’s program in Food Science in collaboration with the University of Copenhagen.