Admission requirements for the M.Sc. Software Engineering program at Poznan University of Technology

According to the program of the studies a successful candidate:

Knowledge

- has extensive and in-depth knowledge of mathematics useful for formulating and solving complex tasks in the field of computer science, e.g., logic programming; formal software specification and verification; as well as tasks in the area of physics, fundamentals of electrical engineering, fundamentals of electronics, and fundamentals of control engineering
- has extensive and in-depth knowledge of physics useful for formulating and solving complex tasks in the field of computer science, e.g., computer graphics and physics simulation in computer games
- has well-established theoretical knowledge regarding algorithms and computational complexity, computer systems architecture, operating systems, networking technologies, programming languages and paradigms, graphics and human-computer interaction, artificial intelligence, databases, software engineering, decision support, and embedded systems
- has knowledge regarding trends and the most important new developments in computer science and related disciplines
- has knowledge related to professional ethics and responsibilities; understands the threats related to electronic crime; understands the nature of mission-critical systems
- is familiar with the fundamental concepts of economics related to IT investments and IT/software projects, such as return on investment, fixed costs and variable costs, financial risk, revenue and profit, profit and cash flow
- has basic knowledge regarding management and running a business
- has basic knowledge related to quality management, including basic knowledge of ISO 9000 standards
- has basic knowledge regarding patents, copyright law and related rights, and the Act on Protection of Personal Data
- knows the general principles of starting and development of forms of individual entrepreneurship
- has a basic understanding of knowledge and technology transfer in respect to IT solutions

Skills

- is able to acquire, combine, interpret and evaluate information from literature, databases and other information sources (in mother tongue and English); draw conclusions, and formulate opinions based on it.
- is able to communicate in mother tongue and English, using different techniques in professional and other environments, also with the use of IT tools
- is able to prepare and give an oral presentation in mother tongue and English regarding specific computer science problems
- is able to use Information and Communication Technologies that are commonly employed in IT projects
- is able to plan and conduct experiments - including measurements and computer simulations; and is able to analyze and interpret their outcomes
- is able to conduct risk analysis of an IT project
- is prepared to work in industrial environment and is able to work in accordance with the safety rules related to the profession of IT specialist
- is able to correctly apply at least one software effort estimation method
- is able to assess computational complexity of algorithms and problems
- is able to develop an object-oriented model of a simple software system (e.g., in UML notation)
- is able to assess software architecture from the perspective of non-functional requirements
- is able to effectively participate in software inspections
- is able to systematically execute functional tests
- is able to prepare use-case-based functional requirements specifications
- is able to formulate non-functional requirements for selected quality characteristics (categories)
- is able to choose appropriate programming language and use it to solve a particular task

Attitude

- understands that knowledge and skills related to computer science quickly become obsolete
- is able to inspire and organize self-education of others
- knows the possibilities of further education (PhD studies; postgraduate studies; courses and certification examinations offered by universities, companies, and professional associations)
- knows examples and understands the causes of the failures of IT systems that have led to major financial or social losses, or caused damage to health or even death
- is able to collaborate and cooperate in a team performing different roles
- is able to correctly assign priorities to own tasks and tasks performed by others
- is able to correctly identify and resolve dilemmas associated with the profession
- is able to think and act in an entrepreneurial way
- is aware of the social role of technical university graduates, and especially understands the need of informing the society (especially through mass-media) about new developments in engineering and other areas; attempts to present the information and opinions in a commonly-understood way, from different points of view