

Programme Syllabus:

International Master's Programme in Computer Engineering, 120 credits

General data

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| Code | TDAAA |
| Cycle | Second cycle |
| Ref no | MIUN 2007/124 |
| Credits | 120 |
| Answerable department | Information Systems and Technology |
| Answerable faculty | Faculty of Science, Technology and Media |
| Established | 2017-07-18 |
| Date of change | 2022-08-11 |
| Version valid from | 2022-07-01 |

Aim

The overall goal of the programme is to provide the student with cutting-edge knowledge in the area of information technology, appropriate for research and advanced development in high-technology companies, regionally, nationally, and internationally.

Programme objectives

OUTCOMES ACCORDING TO THE HIGHER EDUCATION ORDINANCE FOR A MASTER'S DEGREE (TWO YEARS)

Knowledge and understanding

For a Degree of Master students must

- demonstrate knowledge and understanding in their main field of study, including both broad knowledge in the field and substantially deeper knowledge of certain parts of the field, together with deeper insight into current research and development work; and

- demonstrate deeper methodological knowledge in their main field of study.

Skills and abilities

For a Degree of Master students must

- demonstrate an ability to critically and systematically integrate knowledge and to analyse, assess and deal with complex phenomena, issues and situations, even when limited information is available;
- demonstrate an ability to critically, independently and creatively identify and formulate issues and to plan and, using appropriate methods, carry out advanced tasks within specified time limits, so as to contribute to the development of knowledge and to evaluate this work;
- demonstrate an ability to clearly present and discuss their conclusions and the knowledge and arguments behind them, in dialogue with different groups, orally and in writing, in national and international contexts; and - demonstrate the skill required to participate in research and development work or to work independently in other advanced contexts.

Judgement and approach

For a Degree of Master students must

- demonstrate an ability to make assessments in their main field of study, taking into account relevant scientific, social and ethical aspects, and demonstrate an awareness of ethical aspects of research and development work;
- demonstrate insight into the potential and limitations of science, its role in society and people's responsibility for how it is used; and
- demonstrate an ability to identify their need of further knowledge and to take responsibility for developing their knowledge.

SPECIFIC OUTCOMES FOR THE INTERNATIONAL MASTER'S PROGRAMME IN COMPUTER ENGINEERING

After the completion of the programme the student should

- Show thorough understanding of current research and development within the computer engineering area.
- Demonstrate familiarity with development trends and current applications.
- Show high proficiency in mathematical modeling and stochastic simulation of algorithms, protocols, and systems within the area of IP-based computer networks, wireless communication, and multimedia communication.
- Show basic proficiency in software and hardware implementation of algorithms and protocols.
- Show high proficiency in explaining and justifying several important Machine Learning methods. Demonstrate good skills in all aspects of extraction of knowledge from data.
- Show high proficiency in analyzing the technical performance of distributed systems and advanced web services, e.g. regarding security, accessibility,

scalability, response time, error proneness, reusability, and language efficiency.

- demonstrate advanced skills in simulation, modelling and analysis of algorithms and systems

Content

Computer Engineering MA:

Advanced topics, 6 credits

Applied Optimization, 6 credits

Data mining, 6 credits

Distributed Algorithms, 6 credits

Distributed Systems, 6 credits

Networked Embedded Systems and Real-time Applications, 6 credits

Network Security, 6 credits

Probability and Random Processes, 6 credits

Performance Analysis and Simulation of Communication Systems, 6 credits

TCP/IP Internetworking, 6 credits

Wireless Communication, 6 credits

Visualization, 6 credits

Quantitative Research and Development, 6 credits

Two elective courses, totaling 12 credits

Final Project, 30 credits

Entry requirements

Degree of Bachelor (at least 180 credits), Degree of Bachelor of Science in Computer or Electrical Engineering (at least 180 credits), or equivalent, with at least 30 credits in Mathematics/Applied Mathematics, including courses in probability theory and statistics and discrete mathematics, and 60 credits in Computer Engineering including 15 credits in an object oriented programming language.

English course 6 from Swedish Upper Secondary School (Gymnasium) or the equivalent.

Description of programme

The programme is offered as full time studies, during two years.

Selection rules and procedures

The selection process is in accordance with the Higher Education Ordinance and the local order of admission.

Programme with restricted admissions

Specific entry requirements for each course within the program are listed in the respective syllabus. In order to be able to read the second year, it is also required that the student attained at least 45 credits at year-end 2 at the beginning of grade 2. Students who do not meet these requirements should contact the program department for assistance with planning.

Teaching and examination

Teaching and examination procedures are stated in the syllabus of each course. The language used is English.

Title of qualification

Degree of Master of Arts/Science (120 credits)

Teknologie masterexamen med huvudområdet datateknik, translated into Degree of Master of Science (120 credits) with a major in Computer Engineering.

Other information

There is a possibility for changes concerning the time, name, content, level and distribution of the points within the courses during the time the programme is running.