



Information and Communication Technology

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Study plan for third-cycle subject

Subject title

Informations- och kommunikationsteknik (Information and Communication Technology)

Subject description and programme outcomes

Scientific field

The third-cycle subject spans the whole area of Information and Communication Technology ranging over Electronic Components, Circuits and Systems, Networks to Services and User Experience from the academic fields Information Technology, Computer Science, and Electrical & Electronic Engineering.

Description of possible specialisation

1. Communication Systems
2. Electronic Systems
3. Integrated Devices and Circuits
4. Software and Computer Systems

Specification of how the programme outcomes are to be achieved

Objectives for Degree of Licentiate

The objectives for a Degree of Licentiate are stated below, with examples of how these aims can be achieved completely or partly:

Knowledge and understanding

1. Demonstrate knowledge and understanding in the field of research including current specialist knowledge in a limited area of this field as well as specialised knowledge of research methodology in general and the methods of the specific field of research in particular.

- By taking a collection of courses in Information and Communication Technology focused on the doctoral student's main field of research.
- By writing a monograph dissertation or a compilation dissertation with articles that have been published in conferences or journals within the field of research.
- By actively participating in seminars, workshops, conferences, and other research activities.

- This objective is covered by a mandatory course in research methodology and ethics (IL3606 The Art of Doctoral Research or equivalent).

Competence and skills

2. Demonstrate the ability to identify and formulate issues with scholarly precision critically, autonomously and creatively, and to plan and use appropriate methods to undertake a limited piece of research and other qualified tasks within predetermined time frames in order to contribute to the formation of knowledge as well as to evaluate this work.

- By writing as part of a paper or dissertation a review of related work that includes analytical (what is the essence of related work) elements.
- By conducting a careful literature review in the doctoral student's field of research.
- By independently identifying and formulating projects or special tasks aligned with the student's doctoral studies.
- By preparing a licentiate proposal that critically reflects on the doctoral student's own progress towards their licentiate defence.
- This objective is partly covered by a mandatory course in research methodology and ethics (IL3606 The Art of Doctoral Research or equivalent).

3. Demonstrate the ability in both national and international contexts to present and discuss research and research findings in speech and writing and in dialogue with the academic community and society in general.

- By presenting the doctoral student's work in the context of both national and international venues such as seminars, workshops and conferences.
- By presenting a licentiate proposal that demonstrates the doctoral student's own progress.
- By participating in poster competitions or presentations of a popular science nature. Venues are created for these activities by the doctoral workshops co-organised by the doctoral programme, for example through the course ID3015 Presenting Popular Science Posters.
- This objective is partly covered by a mandatory course in research methodology and ethics (IL3606 The Art of Doctoral Research or equivalent).

4. Demonstrate the skills required to participate autonomously in research and development work and to work autonomously in some other qualified capacity.

- By planning and conducting own research starting together with the supervisors but then being driven independently.

Judgement and approach

5. Demonstrate the ability to make assessments of ethical aspects of his or her own research.

- By demonstrating knowledge of ethical standards (for example by applying standard definitions of professional ethics from IEEE and ACM to the doctoral students' own research work).
- This objective is partly covered by a mandatory course in research methodology and ethics (IL3606 The Art of Doctoral Research or equivalent).

6. Demonstrate insight into the possibilities and limitations of research, its role in society and the responsibility of the individual for how it is used.

- This objective is partly covered by a mandatory course in research methodology and ethics (IL3606 The Art of Doctoral Research or equivalent).
- By demonstrating in the dissertation a critical discussion of contributions and limitations as well as impact on society of the doctoral student's research.

7. Demonstrate the ability to identify the personal need for further knowledge and take responsibility for his or her ongoing learning.

- By a careful reflection on future work included in the doctoral student's dissertation.

Objectives for Degree of Doctor

The objectives for a Degree of Doctor are stated below, with examples of how these aims can be achieved completely or partly:

Knowledge and understanding

1. Demonstrate broad knowledge and systematic understanding of the research field as well as up-to-date specialised knowledge in a limited area of this field.

- By taking a collection of courses in Information and Communication Technology focused on both topics within and outside of the doctoral student's main field of research.
- By writing a monograph dissertation or a compilation dissertation with articles that have been published in conferences or journals within the research area or areas where Information and Communication Technology plays an important role.
- By actively participating in seminars, workshops, conferences, and other research activities.
- The main supervisor is responsible to ensure that the accumulated research output of the doctoral student has both sufficient breadth and depth.

2. Demonstrate familiarity with research methodology in general and the methods of the specific field of research in particular.

- This objective is covered by a mandatory course in research methodology and ethics (IL3606 The Art of Doctoral Research or equivalent).

Competence and skills

3. Demonstrate the capacity for scholarly analysis and synthesis as well as to review and assess new and complex phenomena, issues and situations autonomously and critically.

- By writing as part of a paper or dissertation a review of related work that includes both analytical (what is the essence of related work) and synthetical (what is the structure and the combinations not already manifest in related work) elements.
- The discussion part of the dissertation where questions are elevated to a level of overview.
- By participating in the review of workshops, conferences or journal articles.

4. Demonstrate the ability to identify and formulate issues with scholarly precision critically, autonomously and creatively, and to plan and use appropriate methods to undertake research and other qualified tasks within predetermined time frames and to review and evaluate such work.

- By conducting a careful literature review in the doctoral student's research field and neighbouring fields and identify which research questions are still open.
- By independently identifying and formulating projects or special tasks aligned with the student's doctoral studies.
- By preparing a licentiate and PhD proposal that critically reflects on the doctoral student's own progress towards his or her licentiate thesis seminar and public defence of doctoral thesis.
- By participating in the review of workshops, conferences or journal articles.
- This objective is partly covered by a mandatory course in research methodology and ethics (IL3606 The Art of Doctoral Research or equivalent).

5. Demonstrate through a dissertation the ability to make a significant contribution to the formation of knowledge through his or her own research.

- By writing a dissertation.

6. Demonstrate the ability in both national and international contexts to present and discuss research and research findings authoritatively in speech and writing and in dialogue with the academic community and society in general.

- By presenting the doctoral student's work in the context of both national and international venues, such as seminars, workshops and conferences.
- By presenting a licentiate and PhD proposal that demonstrates the doctoral student's own progress.
- By participating in poster competitions or presentations of a popular science nature. Venues are created for these activities by the doctoral workshops co-organised by the doctoral programme, see for example the course ID3015 Presenting Popular Science Posters.
- This objective is partially covered by a mandatory course in research methodology and ethics (IL3606 The Art of Doctoral Research or equivalent).

7. Demonstrate the ability to identify the need for further knowledge.

- By a careful reflection on future work included in the doctoral student's dissertation.
- By contributing in writing research grant proposals where new research questions are being identified and presented.

8. Demonstrate the capacity to contribute to social development and support the learning of others both through research and education and in some other qualified professional capacity.

- By contributing to education and workshops with external parties.
- By contributing to the supervision of degree projects at first and second cycle level.
- By supporting fellow doctoral students in their academic development.
- By reasoning about the impact of the doctoral student's own research on the society.
- By participating in a basic course on communication and teaching.

Judgement and approach

9. Demonstrate intellectual autonomy and disciplinary rectitude as well as the ability to make assessments of research ethics.

- By planning and conducting own research starting together with the supervisors but then being driven independently.
- By demonstrating knowledge on ethical standards (for example, by applying standard definitions of professional ethics from IEEE and ACM to the doctoral student's own research work).
- This objective is partially covered by a mandatory course in research methodology and ethics (IL3606 The Art of Doctoral Research or equivalent).

10. Demonstrate specialised insight into the possibilities and limitations of research, its role in society and the responsibility of the individual for how it is used.

- This objective is partially covered by a mandatory course in research methodology and ethics (IL3606 The Art of Doctoral Research or equivalent).
- By demonstrating in the dissertation a critical discussion of contributions and limitations as well as impact on society of the doctoral student's research.

Sustainability

An additional objective for third-cycle education that leads to the Degree of Licentiate and Degree of Doctor in accordance with KTH's regulations relates to sustainable development. This is captured in the following objective:

- Demonstrate that doctoral student can contribute to the sustainable development of society after graduation.

- Critically reflect on the impact of the doctoral student's own research results on the sustainable development of society. This can be addressed in the doctoral workshop.

As mentioned before, part of the learning outcomes are examined by a mandatory course in research methodology. This course is further discussed in the course part of the respective specialisation.

Communication Systems

Description of the specialisation

Communication Systems is concerned with advanced wired and wireless telecommunication systems, and related techno-economic issues. The main focus is on design and architecture of next generation networks and services.

Current research

Research specializations include optical transport networks, frequency spectrum management, energy efficient networks, user experience and networks for highly reliable and time-critical services, as well as business models for future infrastructures and services. The research is largely applied and conducted in close cooperation with industry. The aim is to promote research that leads to innovation that contributes to improving people's quality of living and producing jobs in Sweden.

Programme structure

Third-cycle education consists of courses and a dissertation. The relevant number of ECTS credits for each part and the total number of ECTS credits is as defined in KTH's regulations.

For a Degree of Doctor, the number of ECTS credits for the course part must be at least 60 ECTS credits and the number of ECTS credits for the dissertation must be at most 180 ECTS credits.

For a Degree of Licentiate, the number of ECTS credits for the course part must be at least 30 ECTS credits and the number of ECTS credits for the dissertation must be at most 90 ECTS credits.

When a student is admitted to third-cycle education, the student will have a main supervisor and at least one assistant supervisor. An assistant supervisor should hold a Degree of Doctor and the main supervisor should hold a docent title or be employed as a professor. Supervisors should have strong connections to KTH and the main supervisor should be employed at least 20% by KTH. It is recommended that at least one of the supervisors has taken a course in research supervision. All supervisors are encouraged to participate in a course in research supervision, for example LH207V Doctoral Supervision. No supervisor should supervise more than ten doctoral students.

The individual study plan (ISP) must be updated at least once a year in agreement between supervisors and doctoral student. The yearly revision normally happens during spring and autumn for all doctoral students, centrally coordinated at the School of Information and Communication Technology.

Courses included in doctoral education must conform to KTH's regulations as to their level and amount of ECTS credits.

Doctoral students must contribute to the academic activities at KTH and the school by actively attending seminars, workshops (including workshops dedicated to doctoral students), and should normally give one presentation per year at a suitable forum.

Compulsory and recommended courses

A 7.5 ECTS credit course in research methodology is mandatory. It is recommended that a student takes the course IL3606 The Art of Doctoral Research, or equivalent. The mandatory course covers the following topics:

- Starting out in research: a general introduction and general research methodology. The topic should correspond to 3 credits.
- Writing and presentation skills for doctoral students. The topic should correspond to 3 credits.
- Research ethics: the main aspects of research ethics. The topic should correspond to 1.5 credits.

The requirement for these mandatory topics can be waived by the main supervisor, provided the respective topics are included and sufficiently documented in earlier education on the second-cycle level. However, in this case the credits cannot be accredited towards the Degree of Doctor. Doctoral students are recommended to take this mandatory course as early as possible in their doctoral education, typically in their first year of doctoral studies.

It is recommended that all doctoral students take a basic course in communication and teaching of around 3 credits, for example LH3000 Basic Communication and Teaching. While this course is mandatory for all doctoral students involved in education at KTH, even externally employed doctoral students and students with a scholarship are encouraged to take a respective course.

Doctoral students within this specialisation are recommended to take the following courses early in their doctoral studies:

- IK3507 Statistical Problems in Simulation
- IK3505 Wireless Access Protocols
- IK3617 Probability and Stochastic Processes for Engineering Applications
- IV3000 Philosophy of Science

Recommended research proficiency courses

- FLH3000 Basic Communication and Teaching 3.0 hp. recommended
- FIL3606 The Art of Doctoral Research 7.5 hp. recommended
- FIK3507 Statistical Problems in Simulation 6.0 hp. recommended
- FIK3505 Wireless Access Protocols 7.5 hp. recommended
- FIK3617 Probability and Stochastic Processes for Engineering Applications 9.0 hp. recommended
- FIV3000 Philosophy of Science 7.5 hp. recommended

Thesis

The dissertation is mandatory and must follow KTH's regulations.

Electronic Systems

Description of the specialisation

The specialisation Electronic Systems focuses on the design of advanced electronic, embedded and cyber-physical systems. These systems use different technologies, spanning from radio electronics and digital hardware to embedded software. The main research focus is on methods and tools for design automation and on architectures for future cyber-physical systems and systems-of-systems.

Current research

Current research includes the following areas: Formal design methods, tools and architectures for the design of mixed-criticality multiprocessor systems; interconnection networks for manycore embedded and cyber-physical systems; brainlike computing for autonomous cyber-physical systems and big-data analytics; massively parallel reconfigurable architectures; hardware security. Most of the research is conducted with national and international partners and in close cooperation between academia and industry.

Programme structure

Third-cycle education consists of courses and a dissertation. The relevant number of ECTS credits for each part and the total number of ECTS credits is as defined in KTH's regulations.

For a Degree of Doctor, the number of ECTS credits for the course part must be at least 60 ECTS credits and the number of ECTS credits for the dissertation must be at most 180 ECTS credits.

For a Degree of Licentiate, the number of ECTS credits for the course part must be at least 30 ECTS credits and the number of ECTS credits for the dissertation must be at most 90 ECTS credits.

When a student is admitted to third-cycle education, the student will have a main supervisor and at least one assistant supervisor. An assistant supervisor should hold a Degree of Doctor and the main supervisor should hold a docent title or be employed as a professor. Supervisors should have strong connections to KTH and the main supervisor should be employed at least 20% by KTH. It is recommended that at least one of the supervisors has taken a course in research supervision. All supervisors are encouraged to participate in a course in research supervision, for example LH207V Doctoral Supervision. No supervisor should supervise more than ten doctoral students.

The individual study plan (ISP) must be updated at least once a year in agreement between supervisors and doctoral student. The yearly revision normally happens during spring and autumn for all doctoral students, centrally coordinated at the School of Information and Communication Technology.

Courses included in doctoral education must conform to KTH's regulations as to their level and amount of ECTS credits.

Doctoral students must contribute to the academic activities at KTH and the school by actively attending seminars, workshops (including workshops dedicated to doctoral students), and should normally give one presentation per year at a suitable forum.

Compulsory and recommended courses

A 7.5 ECTS credit course in research methodology is mandatory. It is recommended that a student takes the course IL3606 The Art of Doctoral Research, or equivalent. The mandatory course covers the following topics:

- Starting out in research: a general introduction and general research methodology. The topic should correspond to 3 credits.
- Writing and presentation skills for doctoral students. The topic should correspond to 3 credits.
- Research ethics: the main aspects of research ethics. The topic should correspond to 1.5 credits.

The requirement for these mandatory topics can be waived by the main supervisor, provided the respective topics are included and sufficiently documented in earlier education on the second-cycle level. However, in this case the credits cannot be accredited towards the Degree of Doctor. Doctoral students are recommended to take this mandatory course as early as possible in their doctoral education, typically in their first year of doctoral studies.

It is recommended that all doctoral students take a basic course in communication and teaching of around 3 credits, for example LH3000 Basic Communication and Teaching. While this course is mandatory for all doctoral students involved in education at KTH, even externally employed doctoral students and students with a scholarship are encouraged to take a respective course.

Doctoral students within this specialisation are recommended to take the following courses early in their doctoral studies:

- IL3008 Embedded Software
- IL3009 Advanced Topics in Embedded System Design
- IL3013 Network Calculus

Recommended in-depth courses

- FIL3009 Advanced Topics in Embedded System Design 7.5 hp. recommended

Recommended research proficiency courses

- FIL3008 Embedded Software 7.5 hp. recommended
- FLH3000 Basic Communication and Teaching 3.0 hp. recommended
- FIL3606 The Art of Doctoral Research 7.5 hp. recommended
- FIL3013 Network Calculus 7.5 hp. recommended

Thesis

The dissertation is mandatory and must follow KTH's regulations.

Integrated Devices and Circuits

Description of the specialisation

The main focus of the research area Integrated Devices and Circuits is experimental research on nano-/micro-electronic and solid state devices and circuits, including device physics, modelling, process integration. The research also focuses on circuit design and system development, as well as the application of such devices in fabricated integrated circuits, utilizing state-of-the art in-house and foundry technologies. The area also includes theory, analysis, design, methodologies, tools, and implementation of circuits and systems.

Current research

We conduct experimental research on devices for future integrated circuits. This covers devices for digital and analog electronics as well as integrated sensors. Our focus is to integrate new materials and device concepts on a silicon based platform to augment the integrated circuit technology. The research is focused on graphene, SiGe, SiC and III-V technologies in combination with established silicon technology and novel metals and oxides. Devices in these materials are used in circuit applications such as sensor arrays, photonic emitters and detectors, high temperature electronics and high voltage switching.

We also perform research on CMOS ultra-low power and high performance circuits and systems for various applications, including biomedical and internet-of-everything devices. Our main focus is on RF, analog and mixed-signal circuits and systems using micro-/nanometer CMOS technologies. The

solid experimental base distinguishes the research, with one of the leading university cleanrooms in Europe. The Electrum Laboratory has excellent facilities- fundamental to accomplish advanced device structures- and will be developed to fulfill future project goals.

Programme structure

Third-cycle education consists of courses and a dissertation. The relevant number of ECTS credits for each part and the total number of ECTS credits is as defined in KTH's regulations.

For a Degree of Doctor, the number of ECTS credits for the course part must be at least 60 ECTS credits and the number of ECTS credits for the dissertation must be at most 180 ECTS credits.

For a Degree of Licentiate, the number of ECTS credits for the course part must be at least 30 ECTS credits and the number of ECTS credits for the dissertation must be at most 90 ECTS credits.

When a student is admitted to third-cycle education, the student will have a main supervisor and at least one assistant supervisor. An assistant supervisor should hold a Degree of Doctor and the main supervisor should hold a docent title or be employed as a professor. Supervisors should have strong connections to KTH and the main supervisor should be employed at least 20% by KTH. It is recommended that at least one of the supervisors has taken a course in research supervision. All supervisors are encouraged to participate in a course in research supervision, for example LH207V Doctoral Supervision. No supervisor should supervise more than ten doctoral students.

The individual study plan (ISP) must be updated at least once a year in agreement between supervisors and doctoral student. The yearly revision normally happens during spring and autumn for all doctoral students, centrally coordinated at the School of Information and Communication Technology.

Courses included in doctoral education must conform to KTH's regulations as to their level and amount of ECTS credits.

Doctoral students must contribute to the academic activities at KTH and the school by actively attending seminars, workshops (including workshops dedicated to doctoral students), and should normally give one presentation per year at a suitable forum.

Compulsory and recommended courses

A 7.5 ECTS credit course in research methodology is mandatory. It is recommended that a student takes the course IL3606 The Art of Doctoral Research, or equivalent. The mandatory course covers the following topics:

- Starting out in research: a general introduction and general research methodology. The topic should correspond to 3 credits.
- Writing and presentation skills for doctoral students. The topic should correspond to 3 credits.
- Research ethics: the main aspects of research ethics. The topic should correspond to 1.5 credits.

The requirement for these mandatory topics can be waived by the main supervisor, provided the respective topics are included and sufficiently documented in earlier education on the second-cycle level. However, in this case the credits cannot be accredited towards the Degree of Doctor. Doctoral students are recommended to take this mandatory course as early as possible in their doctoral education, typically in their first year of doctoral studies.

It is recommended that all doctoral students take a basic course in communication and teaching of around 3 credits, for example LH3000 Basic Communication and Teaching. While this course is mandatory for all doctoral students involved in education at KTH, even externally employed doctoral students and students with a scholarship are encouraged to take a respective course.

Doctoral students within this specialisation are recommended to take the following courses early in their doctoral studies:

- IL3602 Advanced Topics in Mixed-Mode Design
- IH3603 Semiconductor Electrical Characterization
- IH3604 Silicon Carbide Electronics
- IL3603 Low Power Analog and Mixed-Signal ICs
- IH3610 Simulation of Semiconductor Devices
- IL3601 Systematic Design of High Performance Analog Circuits

Recommended in-depth courses

- FIL3602 Advanced Topics in Mixed-Mode Design 7.5 hp. recommended

Recommended research proficiency courses

- FLH3000 Basic Communication and Teaching 3.0 hp. recommended
- FIH3610 Simulation of Semiconductor Devices 7.5 hp. recommended
- FIH3604 Silicon Carbide Electronics 7.5 hp. recommended
- FIH3603 Semiconductor Electrical Characterization 7.5 hp. recommended
- FIL3603 Low Power Analog and Mixed-Signal ICs 7.5 hp. recommended
- FIL3601 Systematic Design of High Performance Analog Circuits 7.5 hp. recommended
- FIL3606 The Art of Doctoral Research 7.5 hp. recommended

Thesis

The dissertation is mandatory and must follow KTH's regulations.

Software and Computer Systems

Description of the specialisation

The main focus of the research area Software and Computer Systems is the fundamental principles of engineering and analysis of Software and Computer Systems and Services.

Current research

The research in Software and Computer Systems is structured into four main areas:

- **Distributed Computing.** The area focuses on systems and tools to design reliable, high performance, and cost effective, software systems in large scale networks. This includes systems for cloud computing, service computing, and social networks.
- **Model-Based Computing.** The area focuses on computer science aspects of programs and models, including model and programming language theory, compilers, formal semantics, constraint programming, real-time systems, and combinatorial optimization. Current research explores various kinds of models, including equation-based models, learning machines, self-organization, non-linear representation, norm-regulated systems and weak constraint models, general constraint models, timed models, and probabilistic models.
- **Software Development and Artificial Intelligence.** The area focuses on methods for software systems development. This includes development of computation models for data analysis system, trust and privacy aspects of social network systems, systems for mobile crowdsensing of smart devices and artificial intelligence methods in software and application development. Application areas are related to healthcare, smart cities and industrial processes automation.
- **Data Science Systems.** The research is currently in a build-up phase. Research in this area explores topics close to some relevant application areas, and also connects the other

research areas. For instance, Data Science Systems are constructed by distributed systems, and modeled as learning systems or autonomous artificially intelligent systems.

Programme structure

Third-cycle education consists of courses and a dissertation. The relevant number of ECTS credits for each part and the total number of ECTS credits is as defined in KTH's regulations.

For a Degree of Doctor, the number of ECTS credits for the course part must be at least 60 ECTS credits and the number of ECTS credits for the dissertation must be at most 180 ECTS credits.

For a Degree of Licentiate, the number of ECTS credits for the course part must be at least 30 ECTS credits and the number of ECTS credits for the dissertation must be at most 90 ECTS credits.

When a student is admitted to third-cycle education, the student will have a main supervisor and at least one assistant supervisor. An assistant supervisor should hold a Degree of Doctor and the main supervisor should hold a docent title or be employed as a professor. Supervisors should have strong connections to KTH and the main supervisor should be employed at least 20% by KTH. It is recommended that at least one of the supervisors has taken a course in research supervision. All supervisors are encouraged to participate in a course in research supervision, for example LH207V Doctoral Supervision. No supervisor should supervise more than ten doctoral students.

The individual study plan (ISP) must be updated at least once a year in agreement between supervisors and doctoral student. The yearly revision normally happens during spring and autumn for all doctoral students, centrally coordinated at the School of Information and Communication Technology.

Courses included in doctoral education must conform to KTH's regulations as to their level and amount of ECTS credits.

Doctoral students must contribute to the academic activities at KTH and the school by actively attending seminars, workshops (including workshops dedicated to doctoral students), and should normally give one presentation per year at a suitable forum.

Compulsory and recommended courses

A 7.5 ECTS credit course in research methodology is mandatory. It is recommended that a student takes the course IL3606 The Art of Doctoral Research, or equivalent. The mandatory course covers the following topics:

- Starting out in research: a general introduction and general research methodology. The topic should correspond to 3 credits.
- Writing and presentation skills for doctoral students. The topic should correspond to 3 credits.
- Research ethics: the main aspects of research ethics. The topic should correspond to 1.5 credits.

The requirement for these mandatory topics can be waived by the main supervisor, provided the respective topics are included and sufficiently documented in earlier education on the second-cycle level. However, in this case the credits cannot be accredited towards the Degree of Doctor. Doctoral students are recommended to take this mandatory course as early as possible in their doctoral education, typically in their first year of doctoral studies.

It is recommended that all doctoral students take a basic course in communication and teaching of around 3 credits, for example LH3000 Basic Communication and Teaching. While this course is mandatory for all doctoral students involved in education at KTH, even externally employed doctoral students and students with a scholarship are encouraged to take a respective course.

Doctoral students within this specialisation are recommended to take the following courses early in their doctoral studies:

- ID3008 Advanced Topics in Distributed Systems
- ID3006 Compilers and Execution Environments
- IK3616 Learning Machines
- IK3620 Types, Semantics, and Programming Languages
- IV3000 Philosophy of Science
- ID3005 Constraint Programming

Recommended in-depth courses

- FID3008 Advanced Topics in Distributed Systems 7.5 hp. recommended

Recommended research proficiency courses

- FIL3606 The Art of Doctoral Research 7.5 hp. recommended
- FLH3000 Basic Communication and Teaching 3.0 hp. recommended
- FID3006 Compilers and Execution Environments 7.5 hp. recommended
- FIK3620 Types, Semantics, and Programming Languages 7.5 hp. recommended
- FIK3616 Learning Machines 7.5 hp. recommended
- FIV3000 Philosophy of Science 7.5 hp. recommended
- FID3005 Constraint Programming 7.5 hp. recommended

Thesis

The dissertation is mandatory and must follow KTH's regulations.

Entry requirements and selection

General and special admission requirements and prior knowledge

Eligibility for and admission to the third-cycle subject is according to KTH's regulations.

Additionally, it is required that a student to be admitted must have documented proficiency in English.

Selection rules and procedures

Selection is made in accordance with KTH's regulations

The programme's degrees and examinations

Degree of Licentiate and Degree of Doctor (PhD)

Issued in accordance with KTH's regulations.

The programme's examinations

All students are strongly encouraged to present a licentiate proposal after having completed around 30% of their doctoral studies. In case a student admitted for a doctoral degree does not also obtain a licentiate degree, the student must present in a public seminar their current progress after having completed around 50% of doctoral studies. All doctoral students admitted for a doctoral degree must present a PhD proposal after having completed around 80% of doctoral studies.

The licentiate proposal should include concrete plans for the contents and structure of the licentiate thesis as well as information on how these plans can be completed to ensure the quality of the licentiate thesis. It is recommended that the advance reviewer for the licentiate thesis is involved already at the licentiate proposal to ensure that proposals on improvements that have been brought up at the licentiate proposal are implemented in the final licentiate thesis.

The PhD proposal should include concrete plans for the contents and structure of the doctoral thesis as well as information about how these plans can be completed to ensure the quality of the thesis. It is recommended that the advance reviewer for the thesis is involved already at the presentation of the PhD proposal to ensure that proposals on improvements that have been brought up in the PhD proposal are implemented in the final thesis.
