



Welcome to the 2-year Master Program on Information and Network Engineering

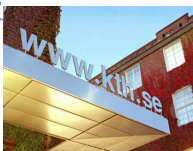
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Welcome to KTH!

- **KTH**, the Royal Institute of Technology
Excellence in Education, Research and Entrepreneurship





Welcome to Stockholm!



Welcome to Sweden!





Agenda

- Presentation round
 - Name
 - Your bachelor: Where and what
 - Work (if any)
- Mixed Information
- Introduction to the course EQ2222
- Walk around campus, socializing

Ask questions, at any time!



KTH—Five Schools, Countless Opportunities

- School of Architecture and the Built Environment
- School of Chemistry, Biotechnology and Health
- **School of Electrical Engineering and Computer Science**
- School of Engineering Science
- School of Industrial Engineering and Management



School of EECS - Research areas

- Decision and Control Systems
- **Information science and engineering**
- Micro and nanosystems
- Robotics, perception, and learning
- Speech, music and hearing
- Electric power and energy systems
- Electromagnetic engineering
- Electronics
- Fusion plasma physics
- Space and plasma physics
- Communication systems
- Computational science and technology
- **Network and systems engineering**
- Software and computer system
- Theoretical computer science
- Media technology and interaction design



Faculty at Information Science and Engineering Division

Professors

- Mikael Skoglund (head)
- Mats Bengtsson
- James Gross
- Joakim Jaldén
- Magnus Jansson
- Tobias Oechtering

Associate Professors

- Saikat Chatterjee
- Markus Flierl
- Ragnar Thobaben
- Ming Xiao

Adjunct Faculty

- Bo Göransson (Ericsson)
- Zhibo Pang (ABB)





Research at Information Science and Engineering (ISE) Division



Wireless Networks



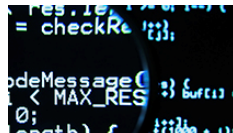
Information & coding



Processing & learning



Multimedia comms.



Privacy and security



Intelligent transport.



Positioning & navigation



ISE, Central (Basic) Research Questions

Fundamental limits in communication, processing, and learning


- What are the fundamental limits in communication, processing, and learning?

Algorithms for efficient communication, processing, and learning

- Which communications, processing, and learning strategies allow for an efficient and (close-to) optimal utilization of resources in achieving their task?



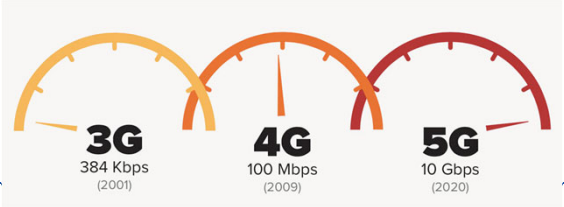
Security, privacy, and trust


- How and under which conditions can we guarantee security, privacy, and trust by design of communications, processing, and learning techniques?



ISE Research Areas

- **Multimedia**
 - Sound/video coding/representation/analysis/synthesis
 - Mobile visual search/3D tele-immersive communication
 - Visual computing and communication
- **Wireless networks**
 - future infrastructure, M2M, cognitive radio, sensor and actuator networks, mmW, wireless caching
- **Physical-Layer Technologies**
 - Wireless transmission/coding/algorithms/protocols/resource optimization
- **Biomedical data analysis**
 - Model based machine learning for automated analysis
 - Image and signal processing, bioinformatics, predictive health care
- **Academic Fields**
 - Algorithms/protocols
 - Coding
 - Communication theory
 - Compression
 - Control theory
 - Information theory
 - Machine learning
 - Networking/systems
 - Signal processing

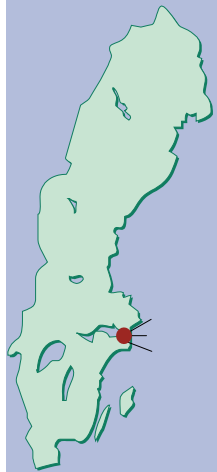


Research at Network and Systems Engineering Department

- Communication Networks
- Opportunistic Networks
- Cyber Physical Systems Security
- Optimization Theory
- Distributed Systems
- Privacy
- Game Theory
- Product Development
- Internet of Things
- Project Management
- Management of Technology
- Quality Management
- Mobile Communications
- Security
- Mobile Edge Computing
- Stochastic Modeling
- Network Analytics
- Wireless Communications
- Networking
- Network Systems Management



KTH Campuses in Stockholm



KTH Campus Valhallavägen



KTH Syd, Campus Telge



KTH IT University, Kista



KTH Campus – in Stockholm City (most courses)

Like a small town in the middle of a big city, the KTH Campus offers a student clinic, a newly built library, the Info-Center, a sports centre, a housing agency, the President's Administration and much more. There are also cafés and restaurants as well as the student union building Nymble.



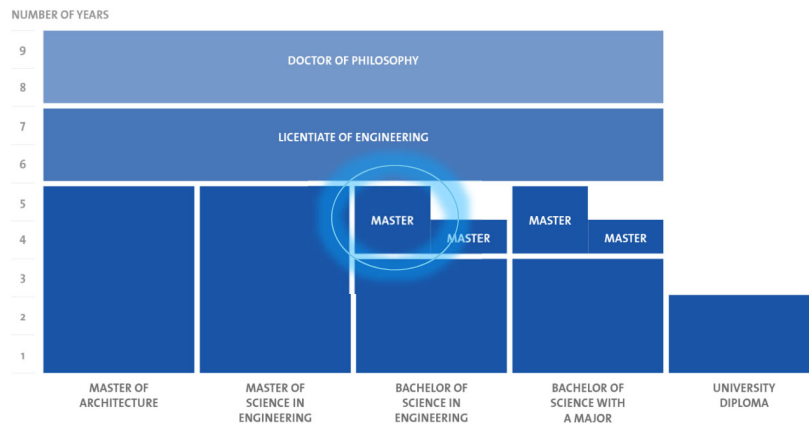


KTH Kista (some elective courses)

KTH Kista is Sweden's leading IT campus. Located in the middle of Kista, one of the world's leading high-tech centres for IT and communications, the campus hosts more than 5,000 students from KTH and Stockholm University.



Structure of Education at KTH





Degrees at KTH

- *Master of Science with a major in ...* (teknologie magister i ...)
 - The Information&Network Engineering Master program degree:
 - **Master of Science with a major in Electrical Engineering. Specialization in Information and Network Engineering.**
 - ...
 - The Swedish Engineering degree (civilingenjör)
 - 5 years (300 cu's) of full-time studies
 - Degree translates into "M.Sc. in Engineering"
 - BSc+MSc! Explicit Bachelor's degree is optional
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The Information&Network Engineering Master Program (TINNM)

- 2 years (3 semesters coursework, 1 sem. thesis)
 - Four study tracks:
 - Communications Engineering
 - Information Engineering
 - Multimedia Processing and Analysis
 - Networked Systems
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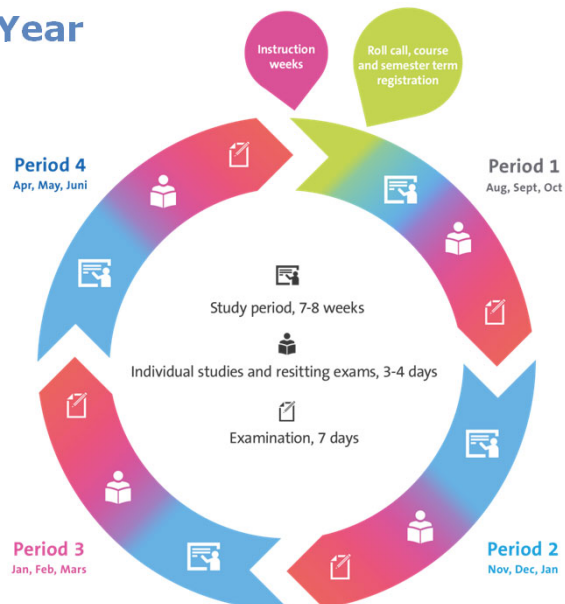
Curriculum, Degree Requirements

- 90 cr.u. (completed) courses + 30 cr.u. degree project
- 5 compulsory courses (4 for students from KTH "CELTE" BSc program)
- Fulfil requirements of **at least one** of the 4 study tracks
- Strongly recommended: 6-15 cr.u. non-technical courses
- Detailed information on Internet:
www.kth.se/social/program/tinnm/
 easiest accessible through your KTH menu.



The Academic Year

- Academic year divided into 4 quarters/periods ("perioder")
- Credit units ("poäng"):
 1 week = 1.5 cr.
 1 quarter = 15 cr.
 1 semester = 30 cr.





Organization of Teaching

- **Voluntary:** Lectures, Tutorials, Help Sessions, (Homework), ...
 - **Mandatory:** Exams, Labs, Projects, (Homework),...
 - **Exams:** Usually written. The ECTS grading system is used.
Passing grades: **A** (highest grade), **B**, **C**, **D**, **E**.
Failing grades: **FX** (possibility to get passing grade if you do some extra assignment), **F**.
 - Students who fail an exam must take re-examination. Typically, exams for a course are given twice per year.
 - **Honor code:** Academic dishonesty taken very seriously at KTH, especially at EECS. See also <https://www.kth.se/en/eeecs/utbildning/hederskodex/inledning-1.17237>
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Course Selection

- First quarter course selection already done, EQ1220+EP2120+EQ2222
 - For period 2 (and possibly elective courses period 1), use form at the program web. Deadline Aug. 29!
 - Following semesters: course selection on-line.
 - Study plan template with course lists+links to detailed course information, available at program web page.
 - Tuition fee only covers 60 credits/academic year.
 - Courses in one study track are obviously elective also in other profiles.
 - Elective courses with course code ID***/IK***=Kista Campus, consider travel time between campuses (unless they are given on-line).
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More on the Course Selection

- Elective courses marked in red are very demanding, offered jointly for PhD students and you. Think twice before selecting!
 - Some of these are only offered every second year:
“odd” = 2021/22, “even” = 2022/23.
 - Swedish courses (optional!!!):
 - On-line “SWELL”
 - Class-room (limited space in this fall semester)
 - Consider [AK1213 Swedish Society, Culture and Industry in Historical Perspective](#) as an alternative
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Thesis Project

- Perhaps the most rewarding part of the program
 - Within the general topic of your study track
 - 30 credits (20 weeks)
 - Carried out in industry or at university (same requirements!).
 - Within Sweden or anywhere in the world!
 - Your own responsibility to find a project!
 - Grade: Pass/Fail
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Thesis Project, Requirements

- Must have taken >60 credits **finished** courses from the program, to start
 - Preferably done during the spring semester, 2nd year
 - Must have taken relevant courses
 - Must be approved by examiner and program director before start.
 - Course requirements:
 - Written report, approved by your supervisor and the examiner
 - Oral presentation at KTH, approved by KTH examiner
 - Attend two other presentations at KTH
 - Act as opponent on another student's presentation
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Practicalities

- Course material:
 - *Buy yourself!*
 - *Main text book – at book store*
 - *Often extra compendiums, ... sold on campus*
 - Time tables:
 - *8-10 means 8:15-9:00 + 9:15-10:00*
 - Separate access cards at Kista campus!
 - Programme web page, especially “Students admitted 2021...”
 - Read your KTH email!
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After COVID-19 — Consequences

- Mix of digital and on-site teaching
- Limit on number of people per room.
- Keep distance! Only use marked seats.
- Never come to campus if you feel ill!
- Examination: Mixed forms!
- Keep updated on the KTH web!

2021-08-26

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Teaching in Period 1

EQ1220 Signal Theory:

- Most teaching at campus.
- For practical reasons, the first lecture is given twice.
Sign up for one of these!
- See the link in Canvas: <https://kth.instructure.com/courses/26953>

EP2120 Internetworking

- Most lectures on-line
- More information in Canvas

2021-08-26

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EQ2222 (EQ2223) Sustainable Information & Network Engineer course

- Course objective and topics
 - Organization and grading
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Objectives

- To cover some important topics of life as a student and as an engineer
 - Study Information&Network Engineering – Why and How
 - Ethical aspects
 - Sustainability – the engineers' role
 - Career planning
 - ...
 - Regularly discuss program related issues
 - Meet with other students of the program – across years
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Course setup

- 4 seminars per year, 2 hours per seminar – 3credits (EQ2222)
 - > 1.5credit version for Erasmus, DD, etc. students (EQ2223)
 - First and second year students mixed, groups of 8-10 students
 - > Groups are defined by the teachers and are fixed
 - Reading-reflection-discussion
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Course setup

- Read some material to prepare
 - Write one page reflection
 - Read reflections from all the others in your group
 - Discuss at the meeting
 - If you miss a meeting, submit a written reflection on reflections
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- Detailed instructions with reading material and questions for reflection are posted on the course web
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Grading

- Based on points collected for reflections and seminar participation
 - Both reflections and participation are compulsory
 - Reflection:
 - 2 points: The reflection is submitted in time, is well-written in terms of structure, language, reference handling and argumentation, and shows good ability to discuss the given topic based on own analysis as well as other literature.
 - 1 point: The reflection is submitted in time and discusses the given topic. The document structure and language is at an acceptable level, or
The reflection fulfils the criteria for 2 points, but is submitted late.
 - 0 points: The reflection is submitted very late (more than one week after the seminar), fails to cover the given topic, or is written in very poor English.
 - Active participation at seminar: 1 point
 - “Reflection on reflections” for missed seminar
 - Agreed in advance and submitted on time: 1 point
 - Not agreed in advance and/or not submitted on time: 0 point
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Grading

- Based on points collected for reflections and seminar participation
 - Both reflections and participation are compulsory
 - 1.5 credits reported after 1st year, full course credits after 2nd year.
 - Max $8 \cdot 3 = 24$ points
 - Grades:
 - A:22-24
 - B:19-21
 - C:16-18
 - D:13-15
 - E:11-12
 - Fx: If you miss the E with n points (e.g, if you have 4 points, then $n=7$) write an n page long document to pass the course. Topic: On the contribution of wireless system engineers to the sustainable society
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First meeting and preparation

- First seminar on week 38 (exact date and time depending on group)
 - Reading material and questions available on week 36 the latest
 - Deadline to submit reflections: one week before the seminar

 - Remember all these, since there will not be any additional information meeting before first seminar!
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