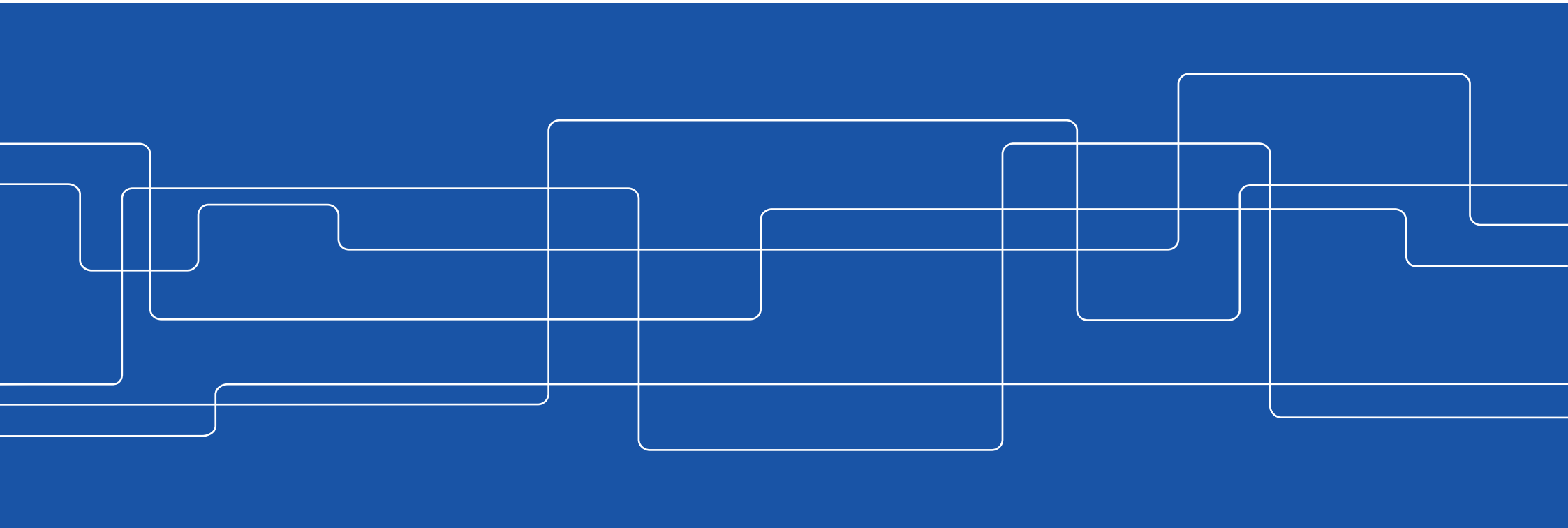# Network Services and Systems

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Topics today

- KTH, EES, LCN
- Student resources
- Curriculum
- Course selection – examples
- Master thesis projects
- Diverse

- EP2220 The Sustainable Network System Engineer – course information

KTH and the Network Services and Systems Program

- Organization
- KTH
- School of Electrical Engineering (EES)
    - Automatic Control
    - Communication Networks (LCN)
    - Communication Theory
    - Electric Power and Energy Systems
    - Electromagnetic Engineering
    - Fusion Plasma Physics
    - Micro and Nanosystems
    - Signal Processing
    - Space and Plasma Physics

- Other schools related to the program
    - Engineering Sciences
    - Computer Science
    - Information and Communication Technology (Kista)
   - Technology and Health (Haninge)

Laboratory for Communication Networks

- The home laboratory for the program
- Gives many of the courses
- Provides mentoring
  - course selection
  - study progress
- Research related master thesis projects

- Faculty:
  - Prof. Gunnar Karlsson, network system design, delay tolerant networking
  - Prof. Rolf Stadler, network management, network analytics, distributed systems
  - Prof. Viktoria Fodor, mathematical modeling, future wireless networks
  - Assoc. prof. Thomas Lind, sensor networks for health
  - Assoc. prof. Panos Papadimitratos, security, in vehicular systems
  - Assoc prof. György Dan, game theory, P2P, cashing
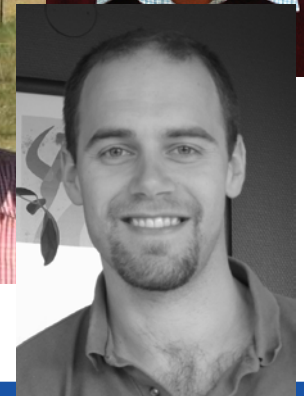
Student offices at EES, contact with teachers

- Student office – student administration
  –   Osquldas vag 10, floor 3, office hours
  –   Course registration, administrative matters, visa, planning to study abroad
- Student office – course administration (STEX)
  -    Osquldas vag 10, at the entrance, office hours, via mail (stex@ee.kth.se)
  -    Course administration, e.g., exam registration, exam results, home assignment submission
- Program director – Viktoria Fodor
  -    Via mail (vfodor@kth.se)
  -    Academic questions: course selection, master thesis matters
- Subject teachers
  -    Via mail
  -    Course related questions, master thesis topic

Curriculum, academic year

- **Academic year**

  - 4 periods per year organized in two semesters (autumn – *höst termin* – HT, spring – *vår termin* – VT)

  - 120 credits: the best solution is 15 credits per period

  - mostly 7.5 credits courses

- **The program setup**

  - periods 1,2 (first half a year): most of the compulsory courses

  - periods 3-6: one more compulsory course, tracks and elective courses

  - periods 7,8 (last half a year): master thesis project

Curriculum, academic year

- 120 credits (max 126)

- 90 credits coursework, 30 credits master thesis

- 37,5 credits compulsory technical courses (5*7,5) + 3 credits Sustainable engineering

- 22,5-30 credits track courses

- 22,5-30 credits elective courses

Curriculum – compulsory courses

Year 1, Period 1

EP2120 Internetworking, 7.5 credits,
- given by the EE and ICT schools
- Gyorgy Dan, Peter Sjodin
- lectures, home assignments, laboratory

AK2036 Methodology and theory of science, 7.5,
- given by the Division of Phylosophy
- lectures, recitations, project

Year 1, Period 2

EP2500 Network system security, 7.5
- EES, LCN Panos Papadimitratos
- lectures, recitations, lab, project

EP2950 Wireless networks, 7.5
- EES, School of Technology and Health
- Thomas Lind
- lectures, recitations, labs, project

Curriculum – compulsory courses

• Year 2, Period 1

EP2300 Network management, 7.5 credits
- EES, LCN Rolf Stadler
- lectures, project

• Over the two years

EP2220 The sustainable network systems engineer, 3 credits
- EES, LCN, Viktoria Fodor
- seminars, writing assignments

Curriculum

- **After period 2 "tracks" for 22,5-30 credits and elective courses for the rest**

- Careful design is required for
- – balanced workload (15 credits per period)
- – some of the courses are given in the Kista campus, you need time to travel

- Design, and Technology, Enterprise
- – you have to select courses from a track for at least 22,5-30 credits
- – feel free to contact me for course selection advice!!!

- Course/track selection in November, but we would like to receive a preliminary list from as soon as possible (early next week?)

Design and Technology
for: research and development
networking + theory courses

- Services
  - Network services and internet based applications
  - Network analytics
- Security
  - Building Networked system security
  - Advanced Networked system security
- Technology
  - Machine to machine communications
  - Principles of wireless sensor networks
  - Software defined networks
- Modeling
  - Queuing theory
  - Performance analysis

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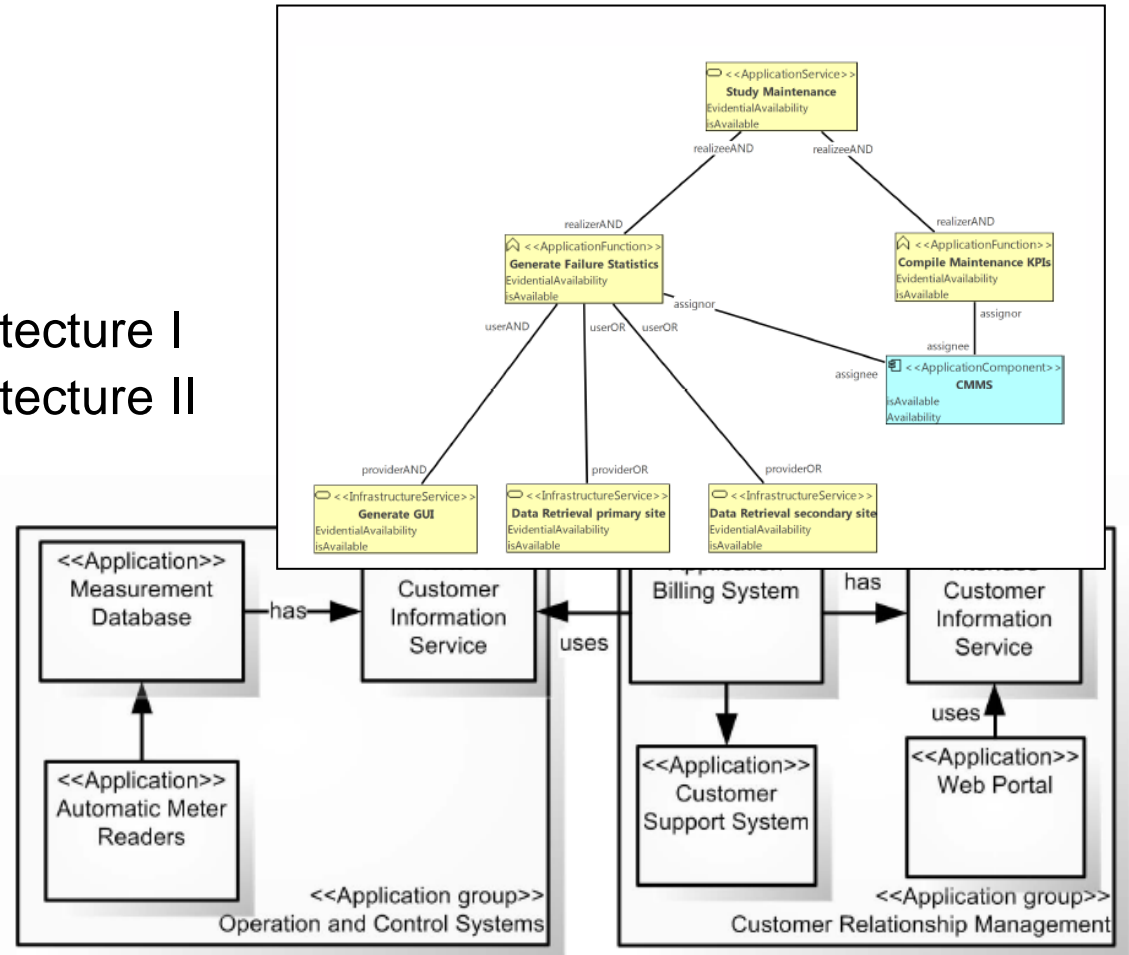
Curriculum - tracks
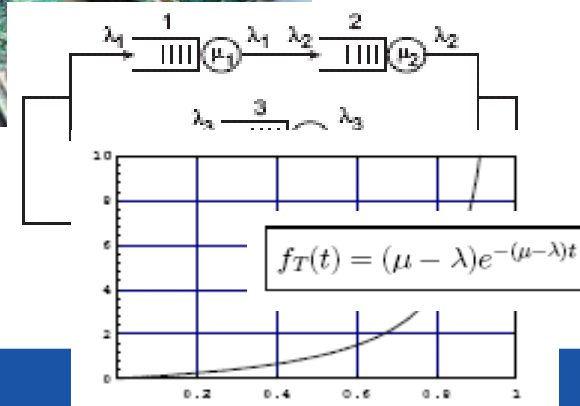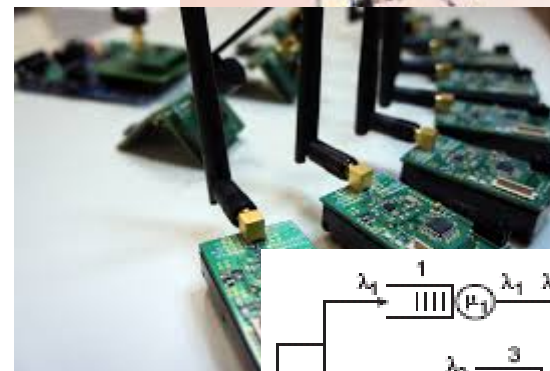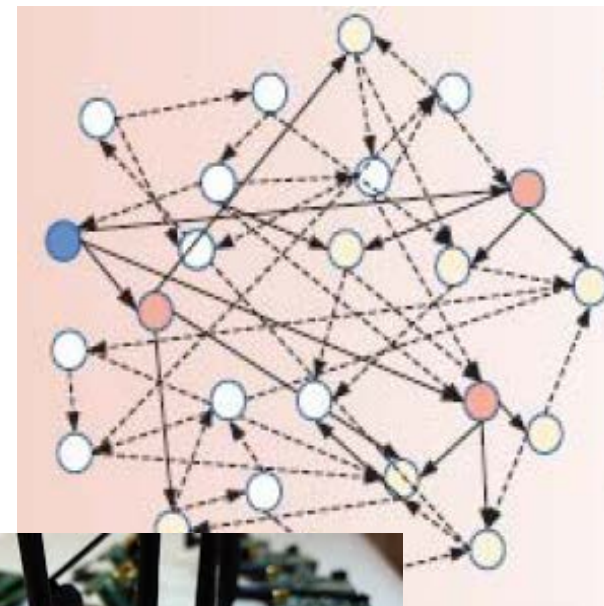
Enterprise

for: management and development

industrial applications

project based courses

- IT management with Enterprise Architecture I
- IT management with Enterprise Architecture II

- Application programming
- Software engineering
- Project management

Curriculum – elective courses

- All KTH courses, if prerequisites are fulfilled
- List of recommended courses available on the web
- Always check prerequisites!

  - you can of course select courses from the other tracks
  - you should select courses that build on each other
    - e.g. network system security block of 3 courses
    - network management and network analytics
    - IT management block of 2 courses
  - EP2800 Project course on NSS
    - see conditions on the course webpage
  - courses on engineering skills, English, Swedish (7.5-15 credits)
    - project management, risk management, business development, leadership, technical English

Curriculum – examples

- Design and Technology – track courses with green

Year 1	Year 2
P1 EP2120 Internetworking AK2036 Theory of Science	P1 EL2745 Princ. Wireless Sensor Nw. EP2300 Network management
P2 EP2950 Wireless Networks EP2500 Networked System Security	P2 EP2nnn Network Analytics EP2510 Advanced Network Security
P3 EP2200 Queuing Theory EP2520 Building Network System Sec.	Master thesis
P4 IK2213 Network Services and Internet-based Applications IK2220 Software Defined Networking	

Curriculum – examples

- Enterprise – track courses with blue

Year 1	Year 2
P1 EP2120 Internetworking AK2036 Theory of Science	P1 EH2780 IT Management II, EP2300 Network management
P2 EP2500 Network system Security EP2950 Wireless Networks	P2 EH2780 IT Management II, cont. EH2030 Business development
P3 EP2520 Building Network System Security *** own preference ***	Master thesis
P4 EH2770 IT Management I IK2213 Network services and apps	

Master thesis in general

30 ECTS, ca. 6 months
- at a company, at KTH, or at another university, even abroad
- 100% of your time
- no given times for start or to finish
- it is your responsibility to find a project

Requirements to start your thesis
- 60 ECTS completed course work, all compulsory courses
- suggestion: if possible take all your courses before you start your master thesis project

Grading (P/F)
- scientific or technical content
- process: independence, responsibility, willingness to learn, deadlines (!)
- presentation skills: written report and oral presentation

WEB resources

- Program page: https://www.kth.se/social/program/tnssm/
- My pages …. Has some different names….
- Course Directory
- general information about all the courses
- www.kth.se/student/kurser/sokkurs?l=en
- KTH Social
- many of the course home-pages, schedules are available here
- www.kth.se/social/
- KTH Library
- www.lib.kth.se
- access to research papers, electronic books, theses works (log in)
- KTH Program library
- www.kth.se/en/student/kth-it-support/software
- Where:
- KTH main page, bottom
- KTH main page, log in, services, etc.

Diverse advices

• Course registration / de-registration
–   altogether you can have 120 credits, 126 if 120 is not possible
–   course application in advance and then course registration at course start on the web
–   you need to de-register within 3 weeks after course start!

•Workload and exams:
–   four periods per year, two courses per period
–   often with few scheduled lectures/labs/recitations
–   significant amount of self study is expected
–   a period is only 8-9 weeks
–   the exams are right after the course – you have to study during the course!
–   re-exams are scheduled one period after the course ends
–   exams can be repeated, better grade counts

• Study in groups
–   lots of advantages
–   note that home assignments have to be solved independently

• Study abroad
–   most of you can study or write your master thesis abroad as all KTH students
–   talk to the people in the student office they will help with visa, insurance, etc.

First lectures and office hour

- EP2120 Internetworking
- Monday, Aug 29, 8:00-10:00 (actually 8:15…) M1

- AK2036 Theory of Science
- Monday, Aug 29, 13:00-15:00 (actually 13:15…) F1

- Office hour – curriculum related questions
- Tuesday, Aug 30, 11:00-12:00
- Viktoria Fodor, Osquldas väg 8, floor 4, Laboratory for Communication Networks (come up on the stairs towards the far end of the building)

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