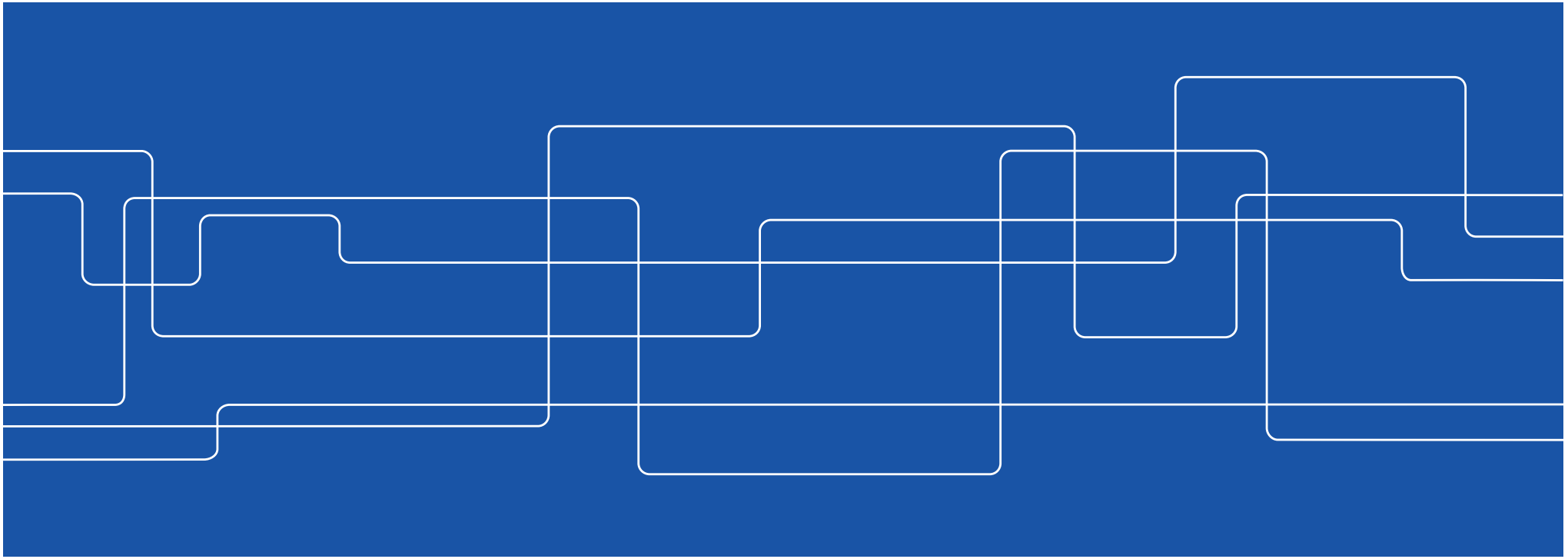
# Systems, Control and Robotics Program information meeting

2022-08-25

Petter Ögren



# Welcome meeting

- **Covid-19 information**
- Who is who
- Courses
  - Academic year with periods
  - Curriculum and requirements
  - Course selection
- Thesis Project work
- Mixed Information
  - Plagiarism, Grading ...

# A safe study environment during COVID-19

Here you can find information for students regarding COVID-19. This may change as a result of recommendations and decisions by the government and other authorities.

> Last update 14 February 11.00 am

## This applies at KTH regaring the covid-related restrictions lifted from 9 February

This applies to KTH because the restrictions ended on 9 February

### Teaching and examination

Teaching and examination which benefit from being implemented in the digital environment, continue to be implemented digitally. Apart from this, teaching and examination will be carried out on campus. Re-furnishing of classrooms on campus will take place gradually from 9 February.

Topp

check for updated on kth.se

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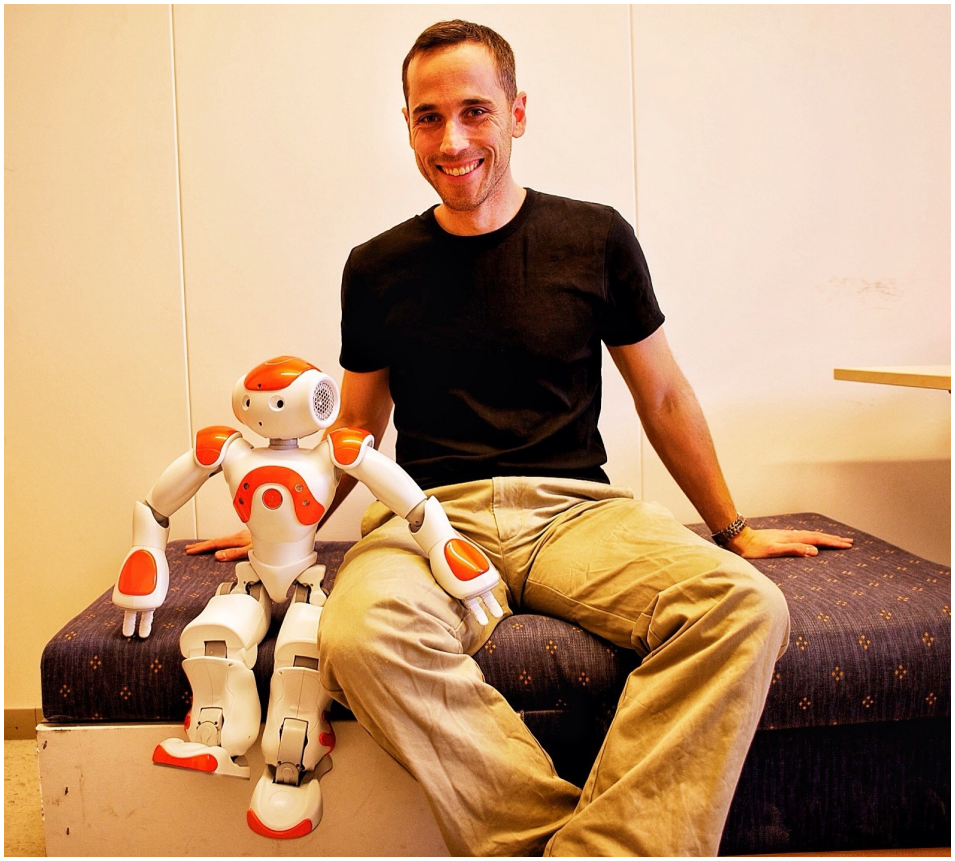
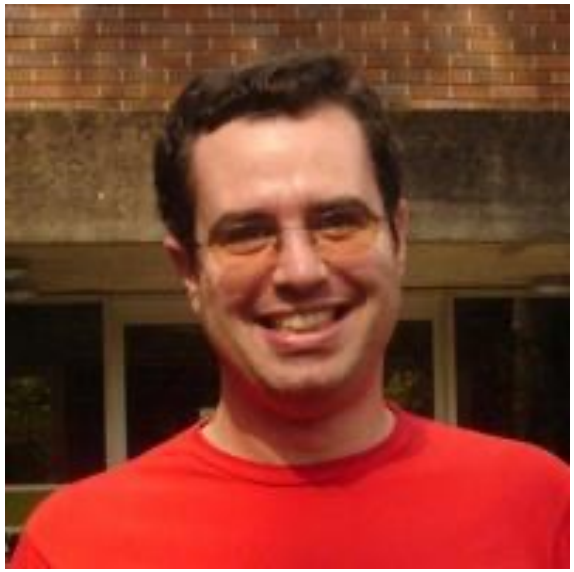
# Master Program Director: Petter Ögren

- Professor at
  - Department of Robotics Perception and Learning (RPL)
  - School of Electrical Engineering and Computer Science (EECS)
- petter@kth.se
- Lindstedsvägen 24, floor 4
- Email to make appointment



# Co-Program director

- Cristian Rojas
- Associate Professor in Automatic Control
- https://www.kth.se/profile/crro
- crro@kth.se
- Malvinas väg 10
- Email for appointment



# Master Coordinators for SCR

- Cristina La Verde and Sofia Norlander
- Lindstedsvägen 3
- ee-master@kth.se
- Ask all questions to Cristina and Sofia!

# Who are you?

Quick round of presentations

- Your name
- Where you come from (Country)

# Welcome meeting

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- **Courses**
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# Program web page

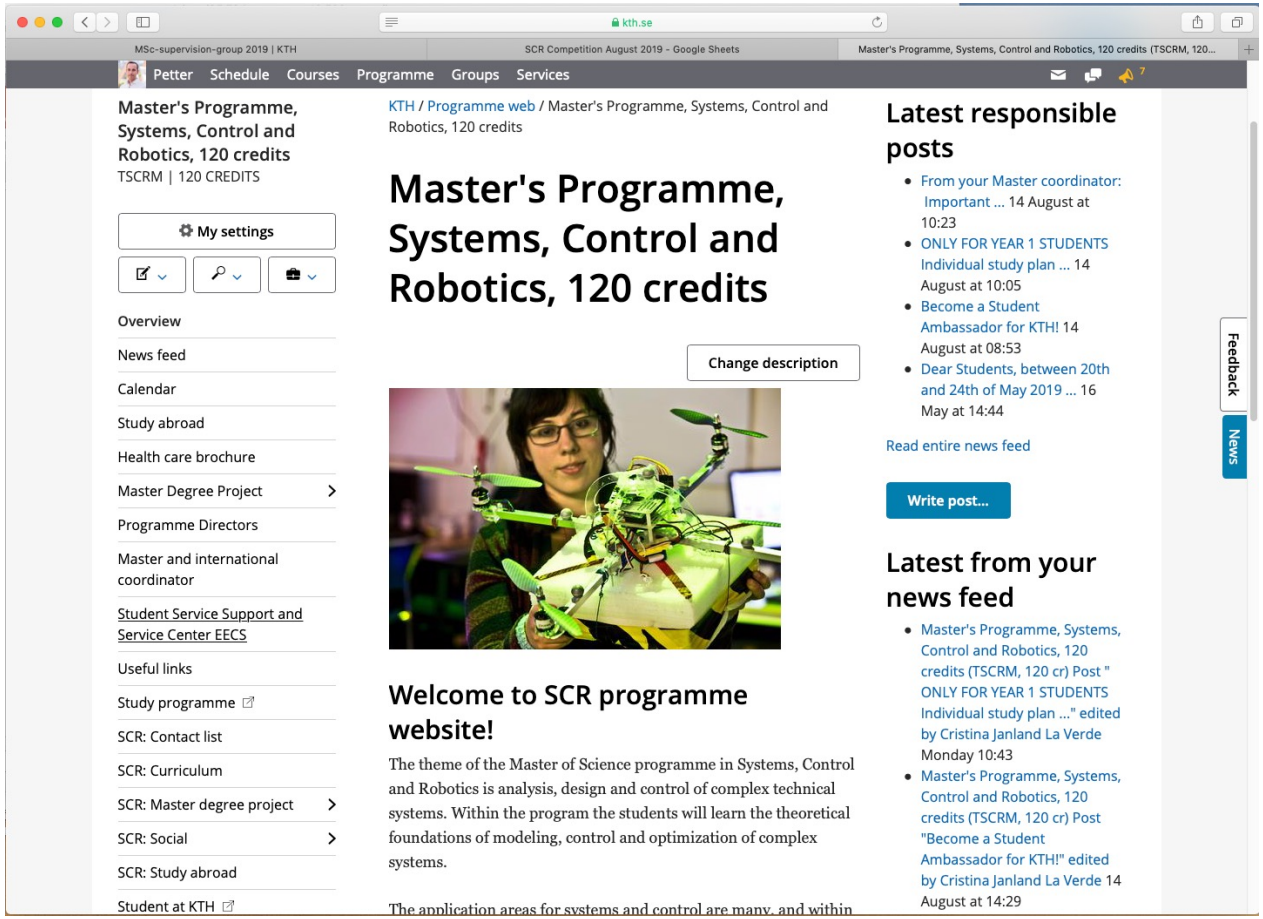
Go to kth.se

Log in (top right corner)

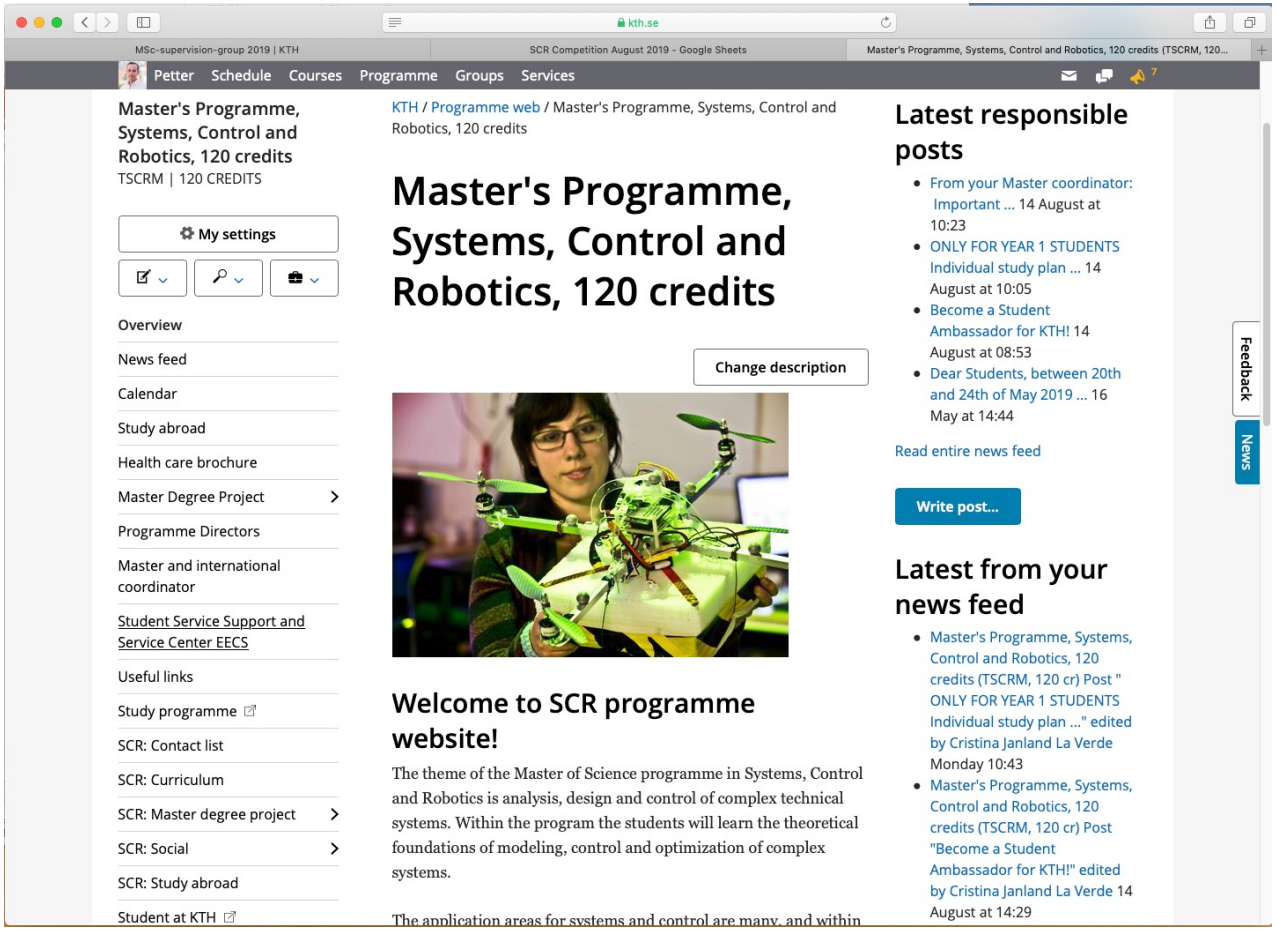
Click on Programme

You will see (or will see when you are registered)

Master's Programme, Systems, Control and Robotics, 120 credits (TSCRM, 120 cr)



# More details on courses on website



# Academic year at KTH

Today

First Exams

**Autumn Term Aug 29, 2022 - Jan 16, 2023**

| | | Week | Mo | Tu | We | Th | Fr | Sa | Su |
|---|---|---|---|---|---|---|---|---|---|
| | Aug | 33 | I/R | I/R | I/R | I/R | I/R | I/R | 21-Aug |
| | | 34 | I/R | I/R | I/R | I/R | I/R | I/R | 28-Aug |
| 1 | Sep | 35 | 1 | 1 | 1 | 1 | 1 | S | 4-Sep |
| 2 | | 36 | 1 | 1 | 1 | 1 | 1 | S | 11-Sep |
| 3 | | 37 | 1 | 1 | 1 | 1 | 1 | S | 18-Sep |
| 4 | | 38 | 1 | 1 | 1 | 1 | 1 | S | 25-Sep |
| 5 | Oct | 39 | 1 | 1 | 1 | 1 | 1 | S | 2-Oct |
| 6 | | 40 | 1 | 1 | 1 | 1 | 1 | S | 9-Oct |
| 7 | | 41 | 1 | 1 | 1 | 1 | 1 | S | 16-Oct |
| 8 | | 42 | O | O | O | E | E | S | 23-Oct |
| 9 | | 43 | E | E | E | E | E | S | 30-Oct |
| 10 | Nov | 44 | 2 | 2 | 2 | 2 | 2 | H | 6-Nov |
| 11 | | 45 | 2 | 2 | 2 | 2 | 2 | S | 13-Nov |
| 12 | | 46 | 2 | 2 | 2 | 2 | 2 | S | 20-Nov |
| 13 | | 47 | 2 | 2 | 2 | 2 | 2 | S | 27-Nov |
| 14 | Dec | 48 | 2 | 2 | 2 | 2 | 2 | S | 4-Dec |
| 15 | | 49 | 2 | 2 | 2 | 2 | 2 | S | 11-Dec |
| 16 | | 50 | 2 | 2 | 2 | 2 | 2 | S | 18-Dec |
| 17 | | 51 | O/R | O/R | O/R | O/R | O | S | 25-Dec |
| 18 | Jan | 52 | H | O | O | O | O | S | 1-Jan |
| 19 | | 1 | O | O | O | O | H | S | 8-Jan |
| 20 | | 2 | E | E | E | E | E | E | 15-Jan |

**Spring Term Jan 17, 2023 - June 5, 2023**

| | Week | Mo | Tu | We | Th | Fr | Sa | Su | |
|---|---|---|---|---|---|---|---|---|---|
| | 3 | T | 3 | 3 | 3 | 3 | S | 22-Jan | 1 |
| | 4 | 3 | 3 | 3 | 3 | 3 | S | 29-Jan | 2 |
| Feb | 5 | 3 | 3 | 3 | 3 | 3 | S | 5-Feb | 3 |
| | 6 | 3 | 3 | 3 | 3 | 3 | S | 12-Feb | 4 |
| | 7 | 3 | 3 | 3 | 3 | 3 | S | 19-Feb | 5 |
| | 8 | 3 | 3 | 3 | 3 | 3 | S | 26-Feb | 6 |
| Mar | 9 | 3 | 3 | 3 | 3 | 3 | S | 5-Mar | 7 |
| | 10 | 3 | O | O | O | E | E | 12-Mar | 8 |
| | 11 | E | E | E | E | E | S | 19-Mar | 9 |
| | 12 | 4 | 4 | 4 | 4 | 4 | S | 26-Mar | 10 |
| Apr | 13 | 4 | 4 | 4 | 4 | 4 | S | 2-Apr | 11 |
| | 14 | 4 | 4 | 4 | 4 | H | S | 9-Apr | 12 |
| | 15 | H | O/R | O/R | O/R | O/R | S | 16-Apr | 13 |
| | 16 | 4 | 4 | 4 | 4 | 4 | S | 23-Apr | 14 |
| May | 17 | 4 | 4 | 4 | 4 | 4 | S | 30-Apr | 15 |
| | 18 | H | 4 | 4 | 4 | 4 | S | 7-May | 16 |
| | 19 | 4 | 4 | 4 | 4 | 4 | S | 14-May | 17 |
| | 20 | 4 | 4 | 4 | H | O | S | 21-May | 18 |
| | 21 | 4 | 4 | O | O | O | S | 28-May | 19 |
| June | 22 | E | E | E | E | E | E | 4-Jun | 20 |
| | 23 | E | H | O/R | O/R | O/R | S | 11-Jun | 21 |

| | |
|---|---|
| I | Introductory weeks |
| H | National Holiday |
| S | Exam and tuition free day |
| 1-4 | Scheuduled day within study period |
| E | Examinations |
| R | Re-examinations |
| O | Own work |

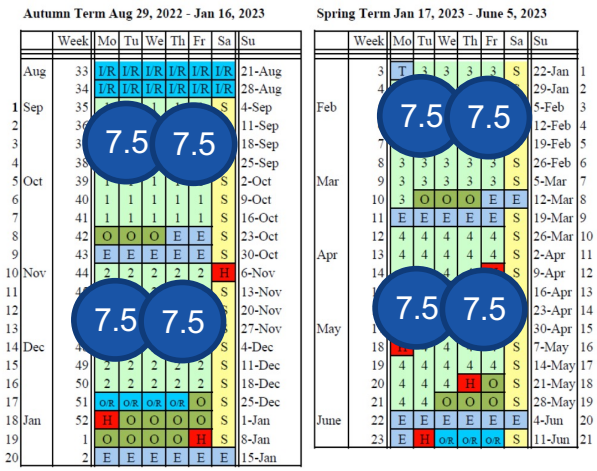
# Academic year with periods

**Year divided into 2 semesters**
Autumn semester (“HT”)
Spring semester (“VT”)

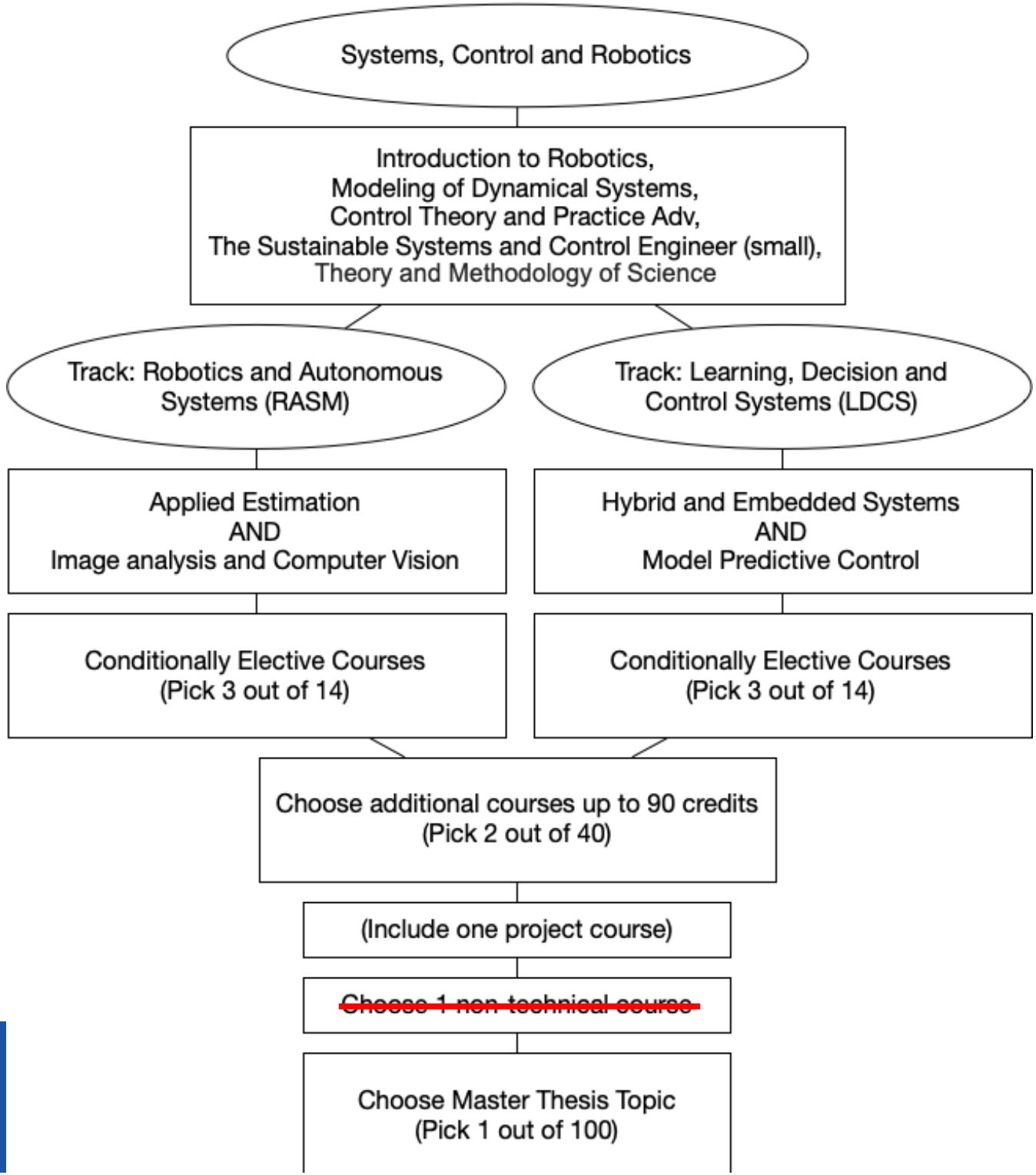
**Each semester has 2 periods/quarters**
Periods 1 + 2 = Autumn semester
Periods 3 + 4 = Spring semester

**Each period about 8-9 weeks**
7-8 for studies + 1 week for exams

**Most courses only run one period**
Lots of new material in short time. Need to be alert all the time!



# Program overview



# Handout of Track Descriptions

# Track: Robotics and Autonomous Systems (Example)

| Course ID | Name | When | Credits | Type |
|---|---|---|---|---|
| EL2220 | The Sustainable Systems and Control Engineer | Y1-Y2 | 3 | Mandatory |
| **Year 1** | | | | |
| EL2820 | Modelling of Dynamical Systems | P1 | 7,5 | Mandatory |
| DD2410 | Introduction to Robotics | P1 | 7,5 | Mandatory |
| DD2423 | Image Analysis and Computer Vision | P2 | 7,5 | Track mandatory |
| EL2320 | Applied Estimation | P2 | 7,5 | Track mandatory |
| DD2419 | Project Course in Robotics and Autonomous Systems | P3-P4 | 9 | Project course **and** Conditionally elective |
| EL2450 | Hybrid and Embedded Control Sys. | P3 | 7,5 | Conditionally elective |
| DD2421 | Machine Learning | P3 | 7,5 | Conditionally elective |
| EL2520 | Control Theory and Practice, adv. | P4 | 7,5 | Mandatory |
| **Year 2** | | | | |
| AK2036 | Theory and Methodology of Science | P1 | 7,5 | Mandatory |
| DD2380 | Artificial Intelligence | P1 | 6 | Conditionally elective |
| DD2415 | Safe robot planning and control | P2 | 6 | Recommended |
| DD2434 | Machine Learning, Adv. Course | P2 | 7,5 | Recommended |
| XXYYYY | Master Thesis | P3-P4 | 30 | Mandatory |

AK2030 4.5

# Track: Learning, Decision and Control Systems (Example)

| Course ID | Name | When | Credits | Type |
|---|---|---|---|---|
| EL2220 | The Sustainable Systems and Control Engineer | Y1-Y2 | 3 | Mandatory |
| **Year 1** | | | | |
| EL2820 | Modelling of Dynamical Systems | P1 | 7,5 | Mandatory |
| DD2410 | Introduction to Robotics | P1 | 7,5 | Mandatory |
| EL2620 | Nonlinear Control | P2 | 7,5 | Conditionally Elective |
| DD2415 | Safe Robot planning and control | P2 | 6 | Conditionally Elective |
| DD2437 | Artificial Neural Networks and Deep Architectures | P3 | 7.5 | Recommended |
| EL2450 | Hybrid and Embedded Control Sys. | P3 | 7,5 | Track Mandatory |
| DD2424 | Deep Learning in Data Science | P4 | 7,5 | Recommended |
| EL2520 | Control Theory and Practice, adv. | P4 | 7,5 | Mandatory |
| **Year 2** | | | | |
| AK2036 or AK2030 | Theory and Methodology of Science | P1 | 7,5 4.5 | Mandatory |
| EL2700 | Model Predictive Control | P1 | 7,5 | Track Mandatory |
| EL2425 | Automatic Control, Project Course, Smaller Course | P2 | 7,5 | Conditionally Elective (and Project Course) |
| EL2805 | Reinforcement Learning | P2 | 7,5 | Conditionally Elective |
| XXYYYY | Master Thesis | P3-P4 | 30 | Mandatory |

# Requirements for Degree

Your Responsibility

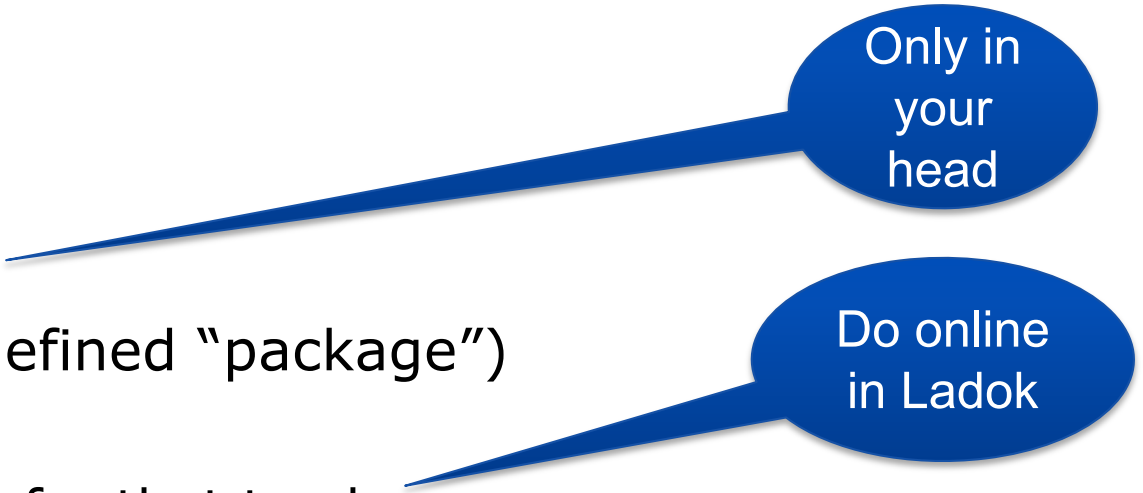
The students must have completed

- all of the **mandatory courses** depending on track
- at **least 3 conditionally elective** technical courses depending on the chosen track
- one **project course** in the subject area
- other **recommended** courses for a total of 90 higher education credits
- **degree project** of 30 higher education credits.

# Course selection

- Step 1
  - Choose track
  - (Track = predefined “package”)
- Step 2
  - Select courses for that track
- Can I Change Track?
  - Yes

- Important: After 2 years, **your courses must** satisfy requirements of at least 1 track



# Understanding the course code

The courses have codes like EL2520 or DD2380

The first character tells what area, second what department/group

- E = Electrical engineering (EL = control)
- D = Computer science etc. (DD = computer science)

The first digit tells what level it is

- 1 – basic (“bachelor”)
- **2 – advanced (“master”)**
- 3 – doctoral (“phd”)

# What Courses do I Choose?

- Fun
- Needed in Track
- makes Combined Schedule reasonable
- Is a prerequisite for future course

# Practical approach to courses

1. Check out 2 example choices of the tracks (https://www.kth.se/social/program/tscrm/page/scr-curriculum/)
2. Pick one track
3. Look though all conditionally elective and recommended courses
4. Try to swap IN the ones you like and REMOVE ones you do not like

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| EL2450 | Hybrid and Embedded Control Sys. | P3 | 7,5 | Conditionally elective |
| DD2421 | Machine Learning | P3 | 7,5 | Conditionally elective |
| EL2520 | Control Theory and Practice, adv. | P4 | 7,5 | Mandatory |
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| AK2036 | Theory and Methodology of Science | P1 | 7,5 | Mandatory |
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You can change these

and these

# Track: Learning, Decision and Control Systems (Example)

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You can change these

and these

and these

# Decide soon on courses for P1 and P2 (fall)

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You can change these

# Where do I choose courses?

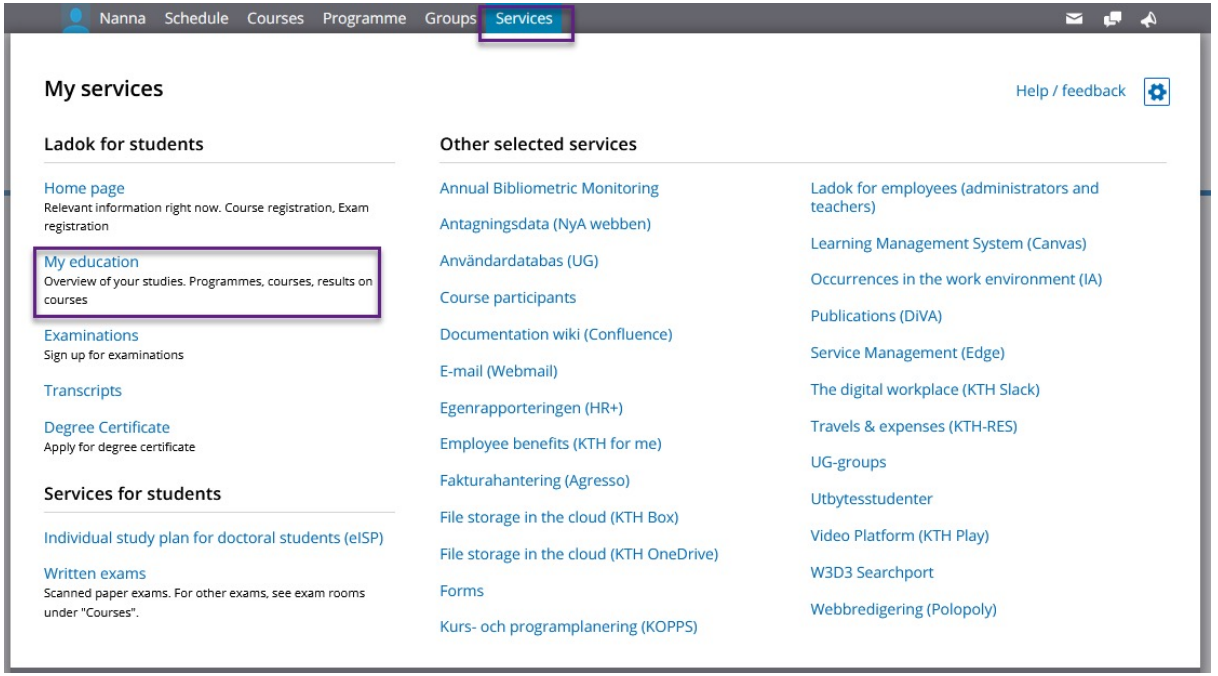
- You use the Ladok-system
  - place where you can see what courses you completed etc
  - Ladok.se (use your KTH login)

# Course selection for p1 and p2 (ht 2022)

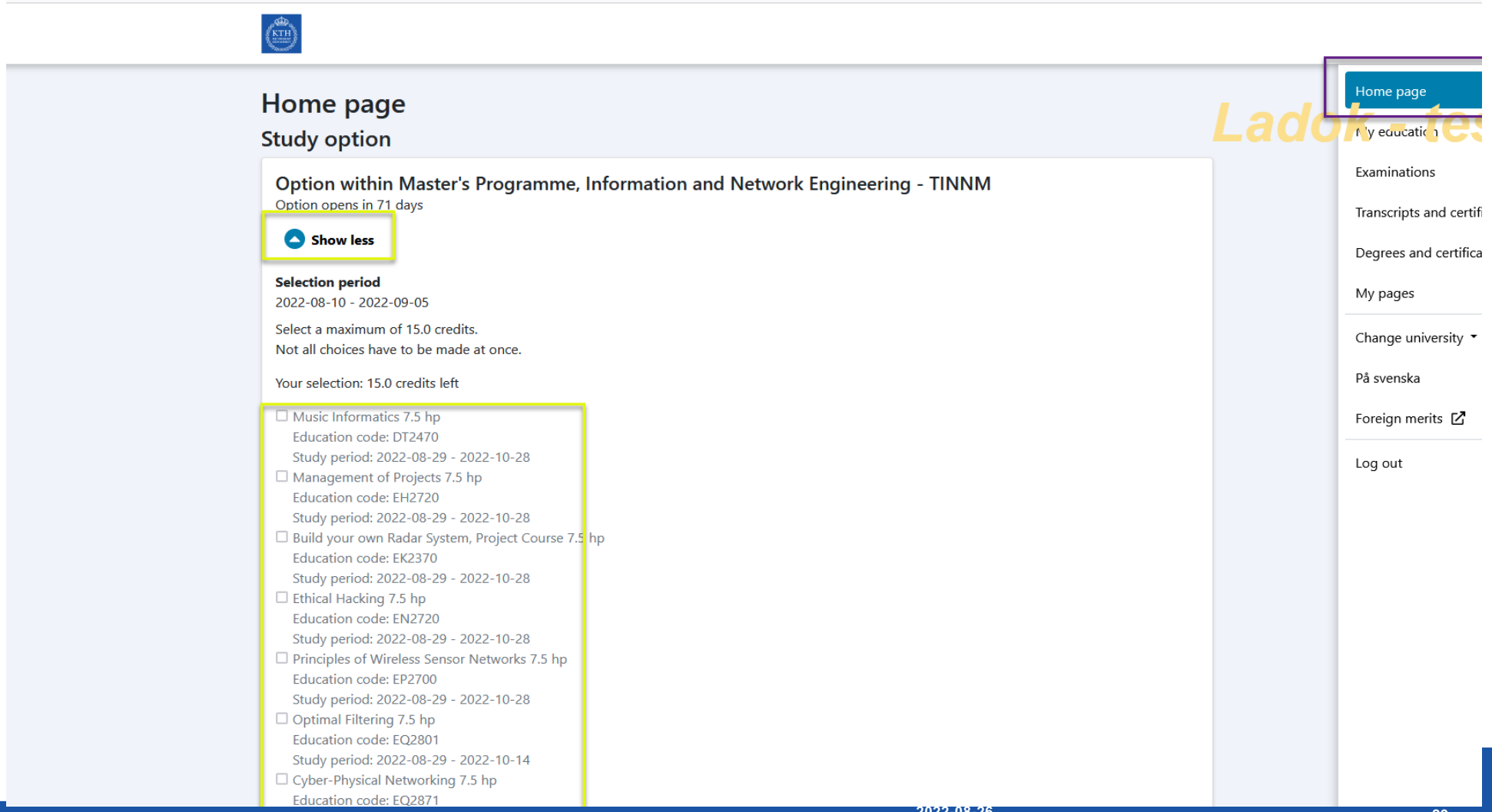
- You will need to select in ladok **elective courses for P1 and P2** in order to reach 30 ECTS
- Deadline*:* The 5th of September 2022 (for P1 and P2)

# Course selection for p1 and p2 (ht 2022)

- Under Services –My Education, you will find **all compulsory courses** for P1 and P2 (admission)



# Course selection for p1 and p2 (ht 2022)



# Stick to the curriculum

If you go outside please ask me first

Prio1: Make sure that you finish the mandatory courses.

KTH restrictive on taking extra courses

# Welcome meeting

- Covid-19 information
- Who is who
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  - Course selection
- **Thesis Project work**
- Mixed Information
  - Plagiarism, Grading ...

# Master thesis

- Typically started in January of the second year
- Need “most courses” (check details) completed **to start**
- This is where you **put everything you learned to use**
- **Where**? in industry, at a KTH department or at other technical university or research institute
- Your responsibility **to find one**
- Need a **supervisor and examiner at KTH** and a local supervisor if you are outside KTH.

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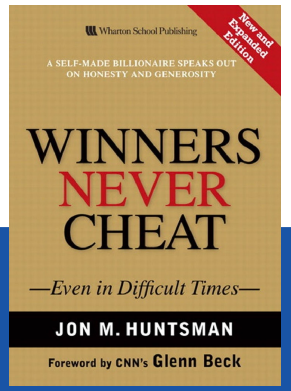
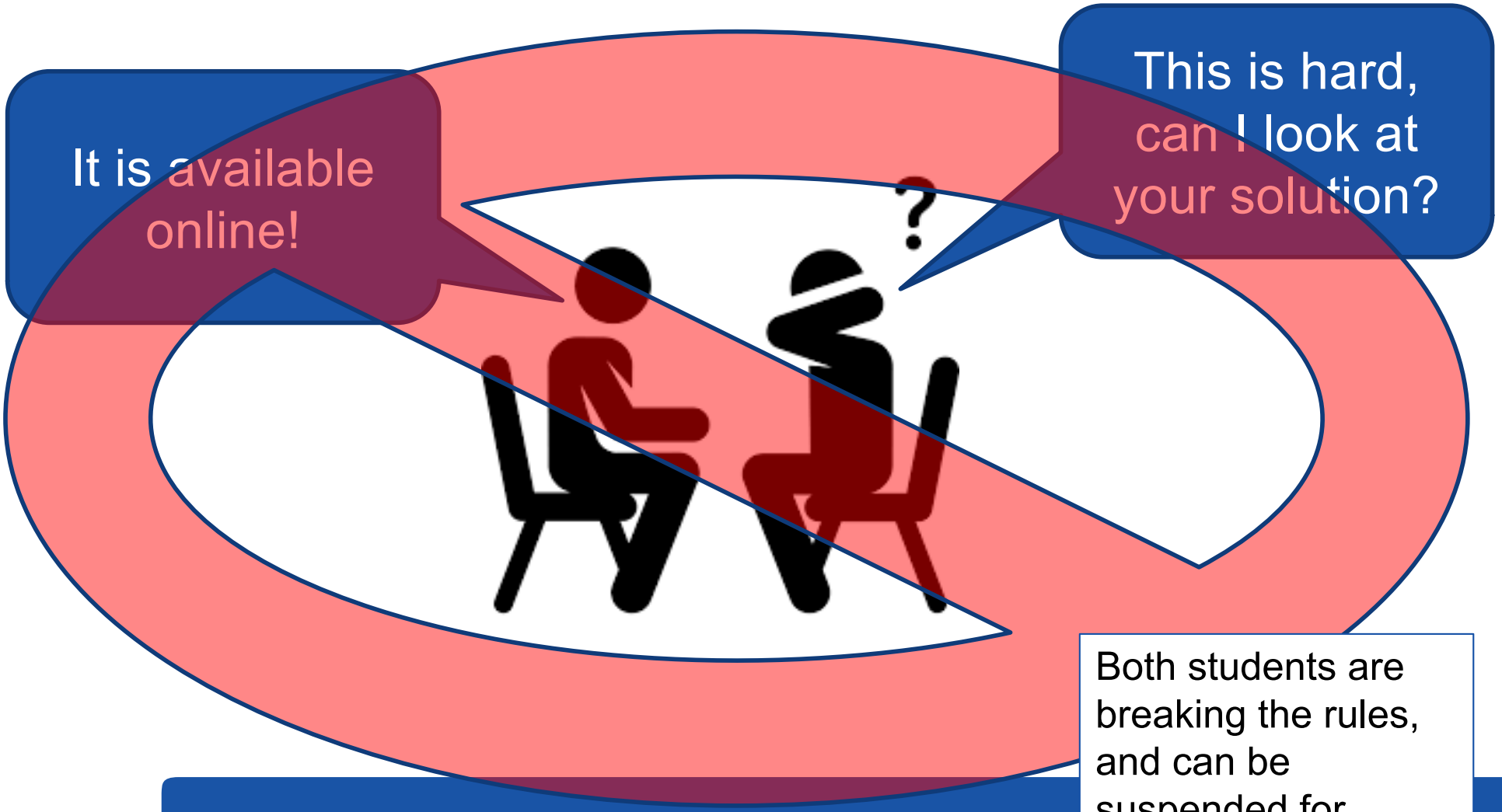
# Reading/writing and Plagarism

- Technical reading and writing skills very important
- **Word by word copying is a big NO-NO**
- **Use your own words or use quotes and references.**
- **Do not share your solutions with others**
- It might not be explicitly stated but these rules are assumed
- If you are caught you will be reported and **can get suspended**



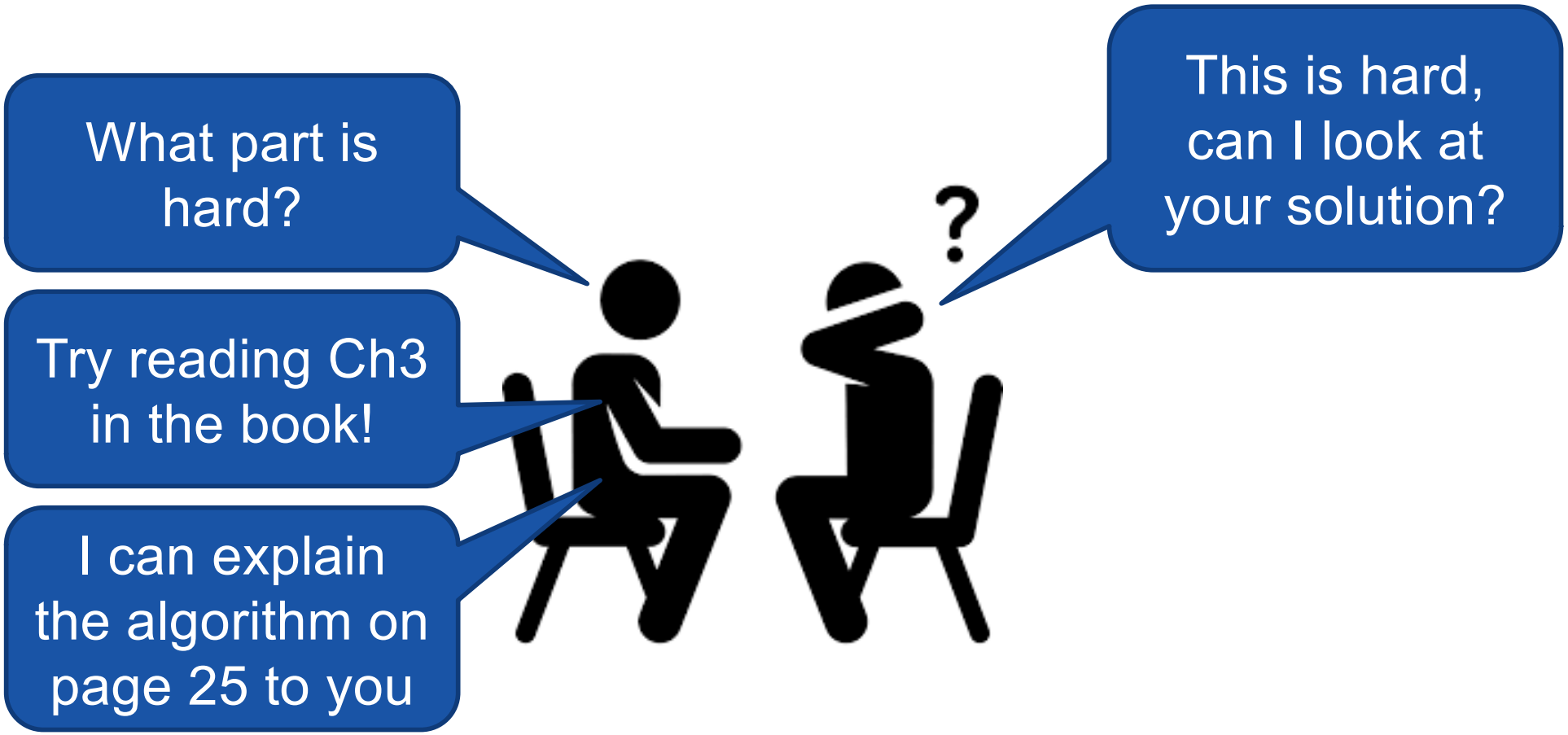
# Word by word copying for a report (No!)

# Sharing solutions with others (No!)




Both students are breaking the rules, and can be suspended for cheating!

# Sharing understanding with others (Yes!)



# Code of Honour

- When studying at this level you will be given a lot of freedom.
- With freedom comes responsibility
- Think about this when working on homework assignments, projects, etc

- EECS Code of Honor
  - https://www.kth.se/en/eecs/utbildning/hederskodex/inledning-1.17237

# Rules in Code of Honour

Rule 1: All members of a group are responsible for the group's work

Rule 2: In any assessment, every student shall honestly disclose any help received and sources used

Regulation 3: In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution

Rule 4: Do not copy from other people's solutions

Rule 5: Handle attendance lists correctly

Rule 6: Give help in the right way

# Grading

- Grades A (excellent) – E (lowest passing grade)
- Grade Fx means you can get to E by some extra task(s)
- Goal oriented and absolute grading system at KTH (and not relative grades)
  - All can fail, **All can get an A**

- Failing an exam is not a total failure
  - re-exams are allowed

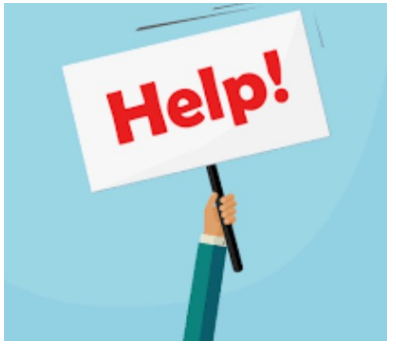
# Going abroad

If you go abroad you can swap courses at KTH for courses in the other university. This way you do not have to “lose time” toward the degree.

It is mandatory to talk to the director/coordinator **before** going abroad to work out a curriculum.

All courses in the curriculum can be exchanged for courses in other universities but the requirements for the match are higher for compulsory courses.

# Teacher student relation




- Ask for help if you need it!
- Ask other students
  - (no copying)
- Ask teachers
  - In brakes between lectures
  - Make appointment

# Why do they keep referring to me as an “undergraduate student”???

At KTH

- Undergraduate = Bachelor + Master
- Graduate = PhD

# Reading email

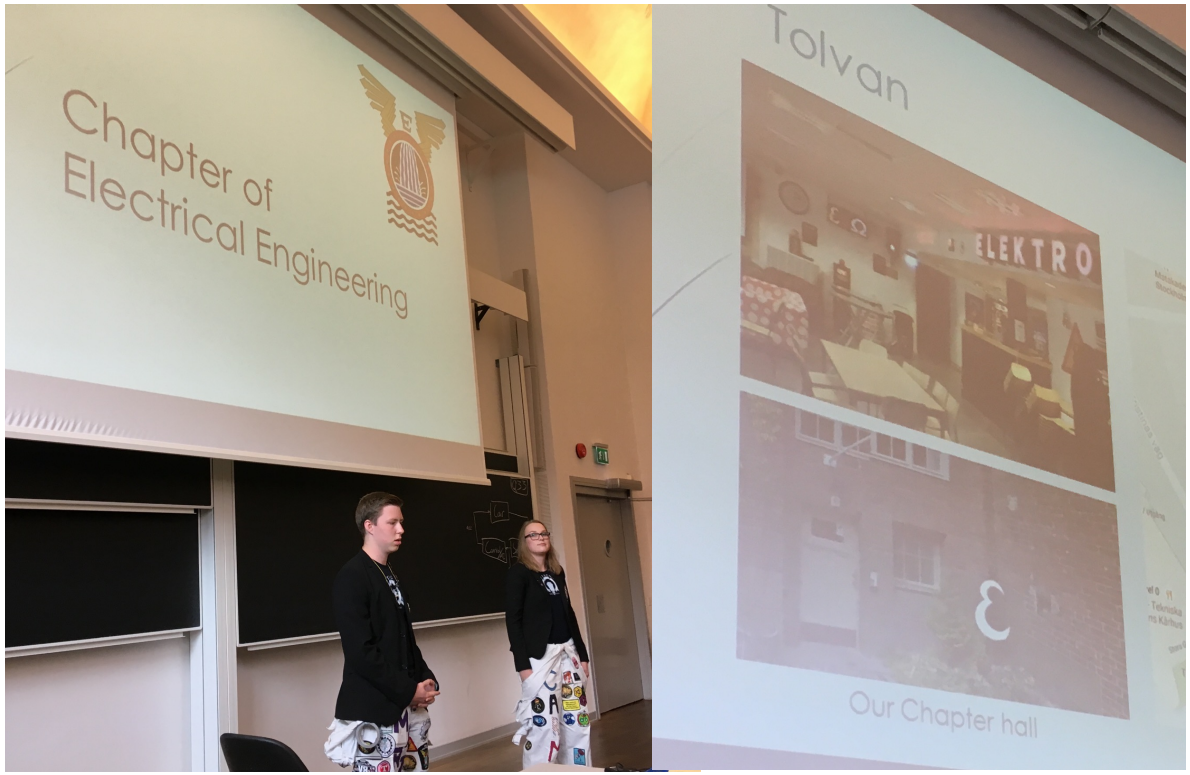
- People will **expect you to read your email**
  - **Check** your kth.se-address, or
  - **Forward it**

# Electrical Engineering Student Chapter at KTH

- Sports
- Boardgames
- Parties

- Facebook: EMiTGlobal
- intsekt@e.kth.se

- Excellent opportunity to get into Swedish student life!



# BSc Program Welcoming at KTH

# Did I tell you all you need to know?

**NO!**

If you want good answers, ask the right person!

- **Other students**: How are things done in practice
  - Swedish students at SCR
  - EE Student Chapter
- **Teachers**: specifics about a course
- Cristina (**ee-master@kth.se**): Admin, course selection, etc
- **Petter**: Curriculum, program wide Q's
- ...
- (contract info on Program website)

# Welcome meeting

Next:
The robot building competition...

- Covid-19 information
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# Questions?