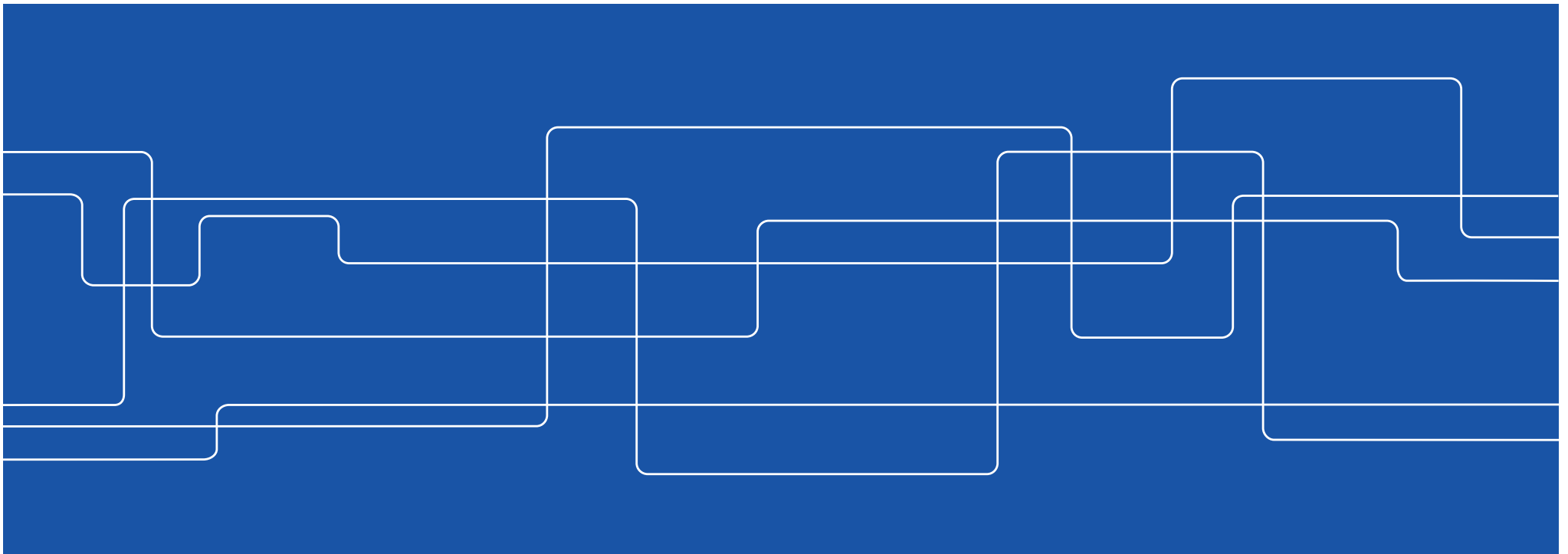




Systems, Control and Robotics Program information meeting

2021-08-26
Petter Ögren





Welcome meeting 26 August 2021

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

Overview table

Covid-19 Information

Impact level	Campus degree of openness	Overall focus
LOW Currently	Campus is open	Teaching and examination where students' learning and the ability to achieve the intended learning outcomes of courses that benefit, or are equally beneficial from being conducted in the digital environment, continue to be conducted digitally. The remaining teaching and examination are conducted on campus.
MEDIUM	Campus is partially open (similar to HT20)	Teaching and examination where students' learning and the ability to achieve intended learning outcomes of courses are at an acceptable level, equally beneficial or benefit from being conducted in the digital environment, continue to be carried out digitally. Teaching and examination with clear needs for physical interaction are carried out on campus.
HIGH	Campus is almost completely closed (similar to Nov-20-VT21)	Teaching and examination where students' learning and the ability to achieve intended learning outcomes of courses have a strong negative impact of it being conducted in the digital environment, are carried out on campus. The remaining teaching and examination are conducted digitally.



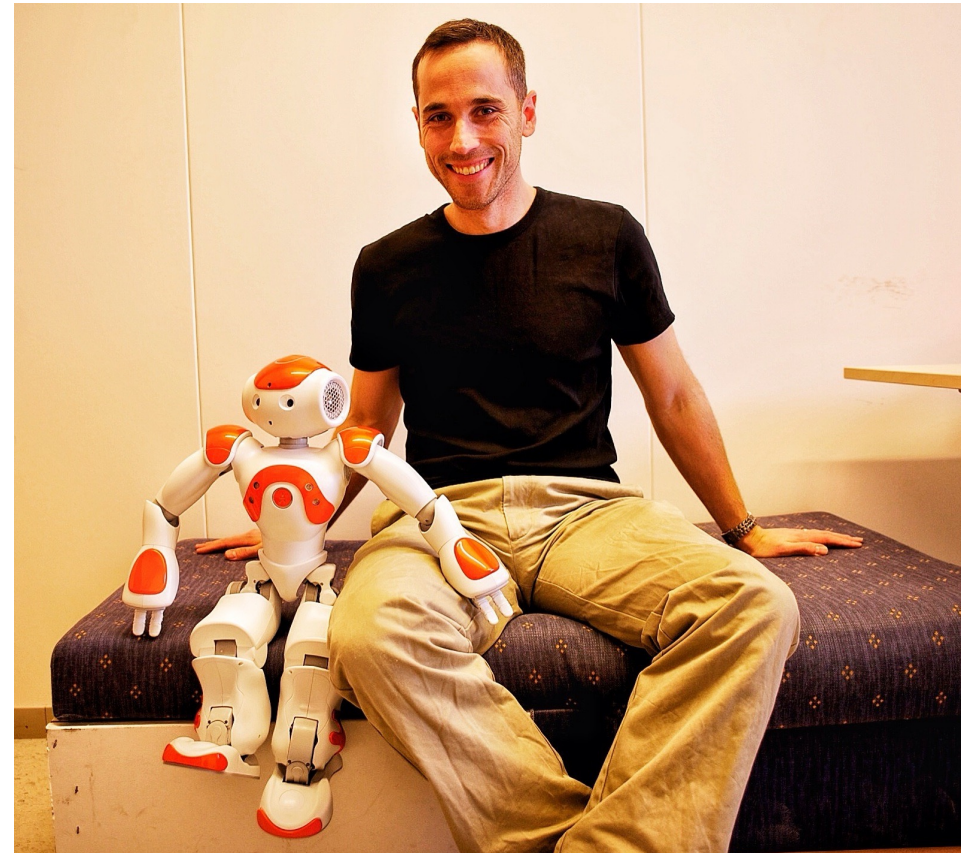
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Master Program Director: Petter Ögren

- 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 26 August 2021

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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)

Master's Programme, Systems, Control and Robotics, 120 credits
TSCRM | 120 CREDITS

My settings

Overview

News feed

Calendar

Study abroad

Health care brochure

Master Degree Project

Programme Directors

Master and international coordinator

Student Service Support and Service Center EECS

Useful links

Study programme

SCR: Contact list

SCR: Curriculum

SCR: Master degree project

SCR: Social

SCR: Study abroad

Student at KTH

KTH / Programme web / Master's Programme, Systems, Control and Robotics, 120 credits

Master's Programme, Systems, Control and Robotics, 120 credits

Change description

Welcome to SCR programme website!

The theme of the Master of Science programme in Systems, Control and Robotics is analysis, design and control of complex technical systems. Within the program the students will learn the theoretical foundations of modeling, control and optimization of complex systems.

The application areas for systems and control are many, and within

Latest responsible posts

- From your Master coordinator: Important ... 14 August at 10:23
- ONLY FOR YEAR 1 STUDENTS Individual study plan ... 14 August at 10:05
- Become a Student Ambassador for KTH! 14 August at 08:53
- Dear Students, between 20th and 24th of May 2019 ... 16 May at 14:44

Read entire news feed

Write post...

Latest from your news feed

- Master's Programme, Systems, Control and Robotics, 120 credits (TSCRM, 120 cr) Post " ONLY FOR YEAR 1 STUDENTS Individual study plan ..." edited by Cristina Janland La Verde Monday 10:43
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More details on courses on website

The screenshot displays the KTH website interface for the Master's Programme, Systems, Control and Robotics. The browser address bar shows 'kth.se'. The page has a dark navigation bar with links: Petter, Schedule, Courses, Programme, Groups, Services. The main content area is titled 'Master's Programme, Systems, Control and Robotics, 120 credits' with 'TSCRM | 120 CREDITS' below it. A 'My settings' button is visible. A sidebar on the left lists various links: Overview, News feed, Calendar, Study abroad, Health care brochure, Master Degree Project, Programme Directors, Master and international coordinator, Student Service Support and Service Center EECS, Useful links, Study programme, SCR: Contact list, SCR: Curriculum, SCR: Master degree project, SCR: Social, SCR: Study abroad, and Student at KTH. The main content area features a large heading 'Master's Programme, Systems, Control and Robotics, 120 credits' with a 'Change description' button. Below this is a photo of a woman holding a drone. The text 'Welcome to SCR programme website!' is followed by a paragraph: 'The theme of the Master of Science programme in Systems, Control and Robotics is analysis, design and control of complex technical systems. Within the program the students will learn the theoretical foundations of modeling, control and optimization of complex systems.' The bottom of the page shows the start of another paragraph: 'The application areas for systems and control are many, and within'. On the right side, there is a 'Latest responsible posts' section with a list of posts: 'From your Master coordinator: Important ... 14 August at 10:23', 'ONLY FOR YEAR 1 STUDENTS Individual study plan ... 14 August at 10:05', 'Become a Student Ambassador for KTH! 14 August at 08:53', and 'Dear Students, between 20th and 24th of May 2019 ... 16 May at 14:44'. Below this is a 'Read entire news feed' link and a 'Write post...' button. At the bottom right, there is a 'Latest from your news feed' section with a list of posts: 'Master's Programme, Systems, Control and Robotics, 120 credits (TSCRM, 120 cr) Post " ONLY FOR YEAR 1 STUDENTS Individual study plan ..." edited by Cristina Janland La Verde Monday 10:43' and 'Master's Programme, Systems, Control and Robotics, 120 credits (TSCRM, 120 cr) Post "Become a Student Ambassador for KTH!" edited by Cristina Janland La Verde 14 August at 14:29'. A 'Feedback' button is located on the far right.

Master's Programme, Systems, Control and Robotics, 120 credits
TSCRM | 120 CREDITS

My settings

Overview
News feed
Calendar
Study abroad
Health care brochure
Master Degree Project
Programme Directors
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Feedback



Academic year at KTH

Autumn: August 30, 2021 - January 17, 2022

Spring: January 18, 2022 - June 7, 2022

Today

First Exams

	Week	Mo	Tu	We	Th	Fr	Sa	Su
Aug	33	I/R	I/R	I/R	I/R	I/R	I/R	22-Aug
	34	I/R	I/R	I/R	I/R	I/R	I/R	29-Aug
Sep	35	1	1	1	1	1	S	5-Sep
	36	1	1	1	1	1	S	12-Sep
	37	1	1	1	1	1	S	19-Sep
	38	1	1	1	1	1	S	26-Sep
Oct	39	1	1	1	1	1	S	3-Oct
	40	1	1	1	1	1	S	10-Oct
	41	1	1	1	1	1	S	17-Oct
	42	O	O	O	E	E	S	24-Oct
	43	E	E	E	E	E	S	31-Oct
Nov	44	2	2	2	2	2	H	7-Nov
	45	2	2	2	2	2	S	14-Nov
	46	2	2	2	2	2	S	21-Nov
	47	2	2	2	2	2	S	28-Nov
Dec	48	2	2	2	2	2	S	5-Dec
	49	2	2	2	2	2	S	12-Dec
	50	2	2	2	2	2	S	19-Dec
	51	O/R	O/R	O/R	O	S	H	26-Dec
Jan	52	O	O	O	O	S	H	2-Jan
	1	O	O	O	H	O	S	9-Jan
	2	E	E	E	E	E	E	16-Jan

	Week	Mo	Tu	We	Th	Fr	Sa	Su
	3	T	3	3	3	3	S	23-Jan
	4	3	3	3	3	3	S	30-Jan
Feb	5	3	3	3	3	3	S	6-Feb
	6	3	3	3	3	3	S	13-Feb
	7	3	3	3	3	3	S	20-Feb
	8	3	3	3	3	3	S	27-Feb
Mar	9	3	3	3	3	3	S	6-Mar
	10	3	O	O	O	E	E	13-Mar
	11	E	E	E	E	E	S	20-Mar
	12	4	4	4	4	4	S	27-Mar
Apr	13	4	4	4	4	4	S	3-Apr
	14	4	4	4	4	4	S	10-Apr
	15	4	4	4	4	H	S	17-Apr
	16	H	O/R	O/R	O/R	O/R	S	24-Apr
May	17	4	4	4	4	4	S	1-May
	18	4	4	4	4	4	S	8-May
	19	4	4	4	4	4	S	15-May
	20	4	4	4	4	4	S	22-May
	21	O	O	O	H	O	S	29-May
Jun	22	E	E	E	E	E	E	5-Jun
	23	H	E	O/R	O/R	O/R	S	12-Jun

- I Introductory weeks
- H National Holiday
- S Exam and tuition free day
- 1-4 Scheduled day within study period
- E Examinations
- RE 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

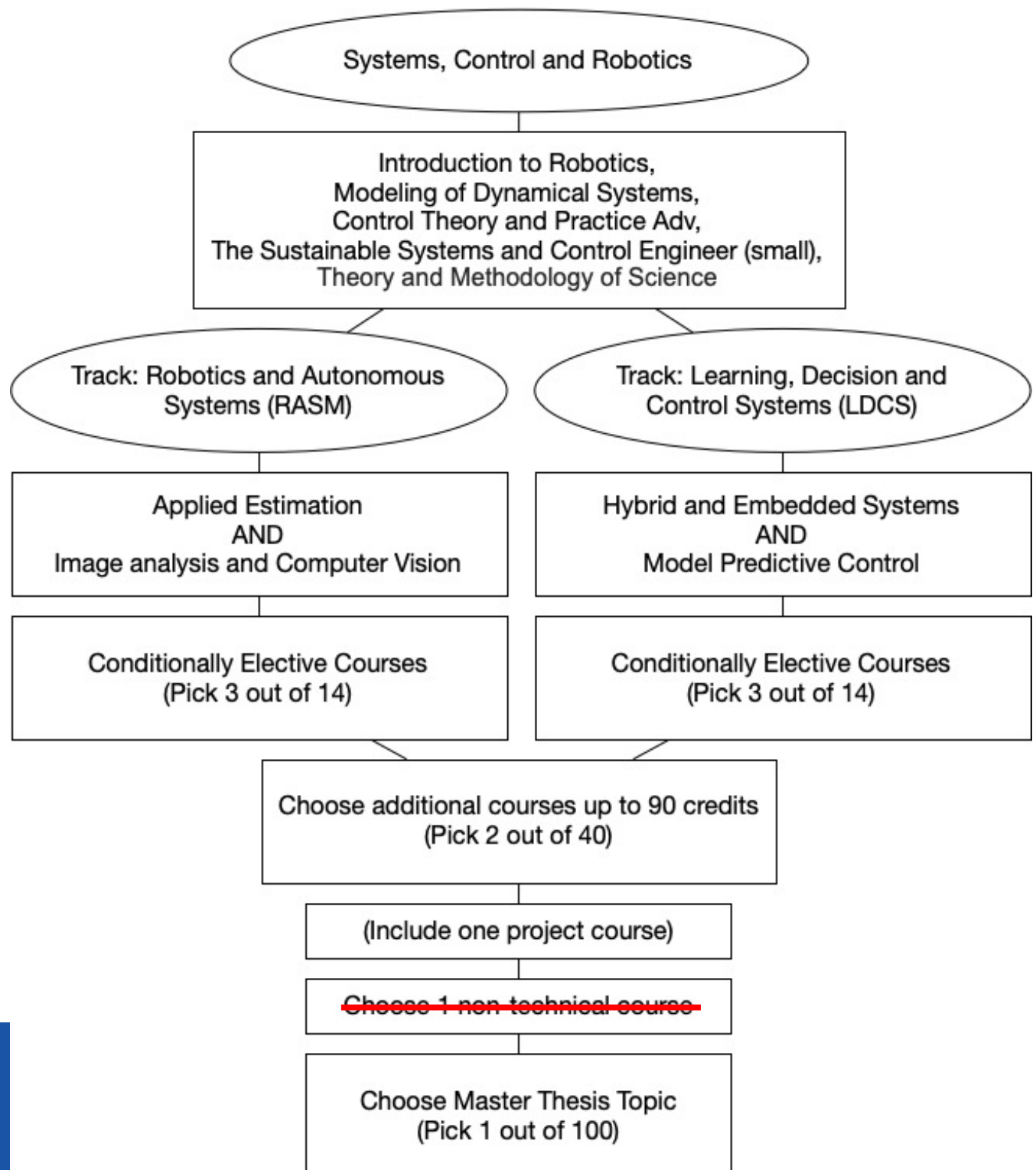
Lots of new material in short time. Need to be **alert** all the time!

Autumn: August 30, 2021 - January 17, 2022 Spring: January 18, 2022 - June 7, 2022

	Week	Mo	Tu	We	Th	Fr	Sa	Su		Week	Mo	Tu	We	Th	Fr	Sa	Su
Aug	33	1R	1R	1R	1R	1R	1R	1R	22-Aug	3	T	3	3	3	3	S	23-Jan
	34	1R	1R	1R	1R	1R	1R	1R	29-Aug	4	3	3	3	3	3	S	30-Jan
Sep	35	1	1	1	1	1	1	S	5-Sep	5	7.5	7.5	7.5	7.5	7.5	S	6-Feb
	36	1	1	1	1	1	1	S	12-Sep	6	7.5	7.5	7.5	7.5	7.5	S	13-Feb
	37	1	1	1	1	1	1	S	19-Sep	7	7.5	7.5	7.5	7.5	7.5	S	20-Feb
	38	1	1	1	1	1	1	S	26-Sep	8	7.5	7.5	7.5	7.5	7.5	S	27-Feb
Oct	39	1	1	1	1	1	1	S	3-Oct	9	7.5	7.5	7.5	7.5	7.5	S	6-Mar
	40	1	1	1	1	1	1	S	10-Oct	10	7.5	7.5	7.5	7.5	7.5	S	13-Mar
	41	1	1	1	1	1	1	S	17-Oct	11	7.5	7.5	7.5	7.5	7.5	S	20-Mar
	42	O	O	O	O	E	E	S	24-Oct	12	7.5	7.5	7.5	7.5	7.5	S	27-Mar
	43	E	E	E	E	E	E	S	31-Oct	13	7.5	7.5	7.5	7.5	7.5	S	3-Apr
Nov	44	2	2	2	2	2	2	S	7-Nov	14	7.5	7.5	7.5	7.5	7.5	S	10-Apr
	45	2	2	2	2	2	2	S	14-Nov	15	7.5	7.5	7.5	7.5	7.5	S	17-Apr
	46	2	2	2	2	2	2	S	21-Nov	16	7.5	7.5	7.5	7.5	7.5	S	24-Apr
	47	2	2	2	2	2	2	S	28-Nov	17	7.5	7.5	7.5	7.5	7.5	S	1-May
Dec	48	2	2	2	2	2	2	S	5-Dec	18	7.5	7.5	7.5	7.5	7.5	S	8-May
	49	2	2	2	2	2	2	S	12-Dec	19	7.5	7.5	7.5	7.5	7.5	S	15-May
	50	2	2	2	2	2	2	S	19-Dec	20	7.5	7.5	7.5	7.5	7.5	S	22-May
	51	O	O	O	O	O	S	H	26-Dec	21	7.5	7.5	7.5	7.5	7.5	S	29-May
	52	O	O	O	O	O	S	H	2-Jan	22	7.5	7.5	7.5	7.5	7.5	S	5-Jun
Jan	1	O	O	O	H	O	S	S	9-Jan	23	7.5	7.5	7.5	7.5	7.5	S	12-Jun
	2	E	E	E	E	E	E	E	16-Jan								



Program overview





Handout of Track Descriptions





<https://www.kth.se/en/studies/master/systems-control-robotics>

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
XXYYYY	Non Technical Course	P2	6-7.5	Mandatory
DD2434	Machine Learning, Adv. Course	P2	7,5	Recommended
XXYYYY	Master Thesis	P3-P4	30	Mandatory



Track: Learning, Decision and Control Systems (Example)

<https://www.kth.se/en/studies/master/systems-control-robotics>

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
SF2832	Mathematical Systems Theory	P2	7,5	Conditionally Elective
XXYYYY	Non Technical Course	P3	6	Mandatory
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	Theory and Methodology of Science	P1	7,5	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

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 or two elective **non-technical** courses~~
- 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

Only in
your
head

Complete
online
form



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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XXYYYY	Master Thesis	P3-P4	30	Mandatory

You
can
change
these

and
these



Where do I choose courses?

- The first semester (P1 & P2) you use an online form
 - <https://www.kth.se/form/courseselectiontsrmht21>
 - Deadline, August 29th (Sunday)
- Then you use the Ladok-system (place where you can see what courses you completed etc)
 - Ladok.se (use your KTH login)



If you want to take the track **Robotics and Autonomous Systems (RASM)** you would typically fill in as follows, listing the two track mandatory courses that are given in P2

- P2: DD2423 Image Analysis and Computer Vision
- P2: EL2320 Applied Estimation
- P1: (empty)

If you want to take the track **Learning, Decision and Control Systems (LDCS)**, the track mandatory courses are given in P3 of year 1 and P1 of year 2 which makes your choice now more open. Look through the conditionally elective courses listed, one choice would be

- P2: EL2620 Nonlinear Control
- P2: SF2832 Mathematical Systems Theory
- P1: (empty)

Elective course, Period 2

Specify course code and course name.

Required

AA1111, Course Registration, Introductory Course

Elective course, Period 2

Specify course code and course name.

AA1111, Course Registration, Introductory Course

Elective course, Period 1



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 26 August 2021

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- **Thesis Project work**
- Mixed Information
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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.



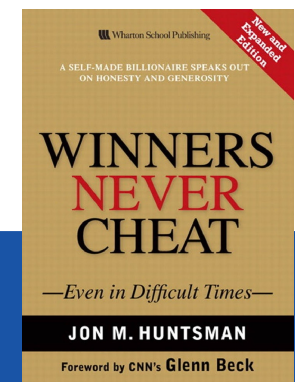
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Reading/writing and Plagiarism

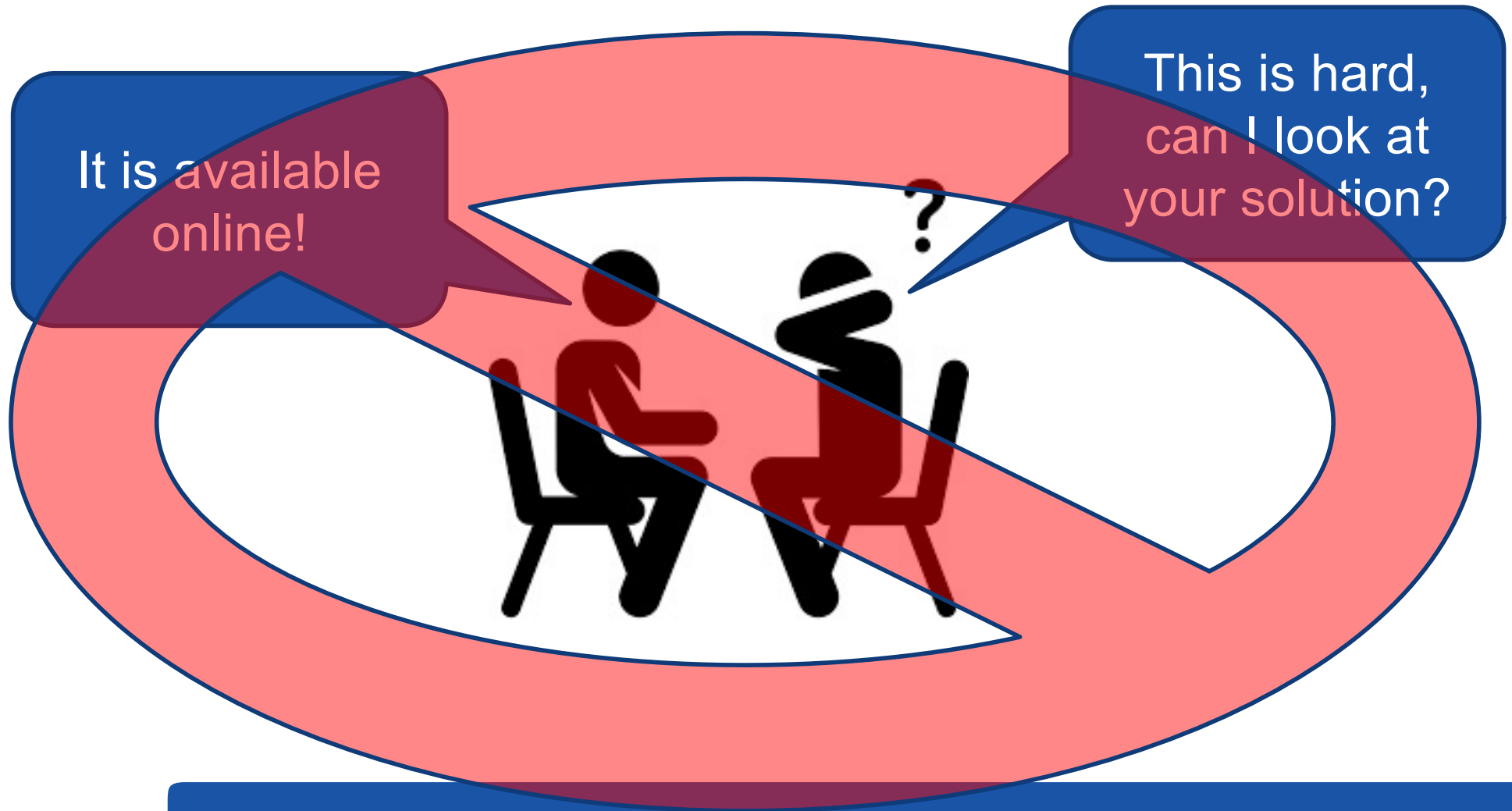
- Technical reading and writing skills very important
- **Word by word copying is a big NO-NO**
- **Use your own words or use quotes and references.**
- **Do not share your solutions with others**
- It might not be explicitly stated but these rules are assumed
- If you are caught you will be reported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



Word by word copying for a report (No!)



Sharing solutions with others (No!)

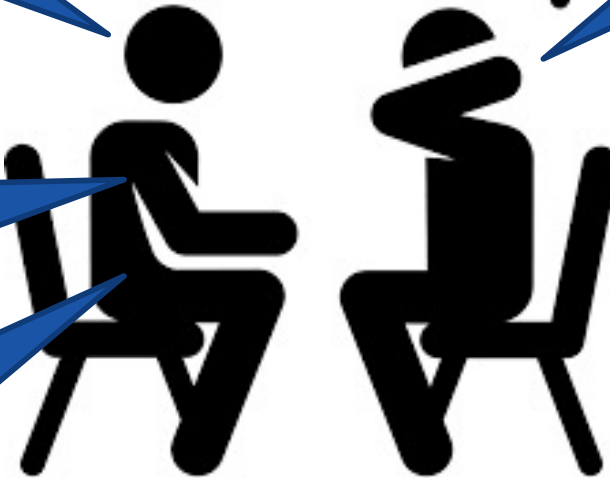


Sharing understanding with others (Yes!)

What part is hard?

Try reading Ch3 in the book!

I can explain the algorithm on page 25 to you



This is hard, can I look at your solution?



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



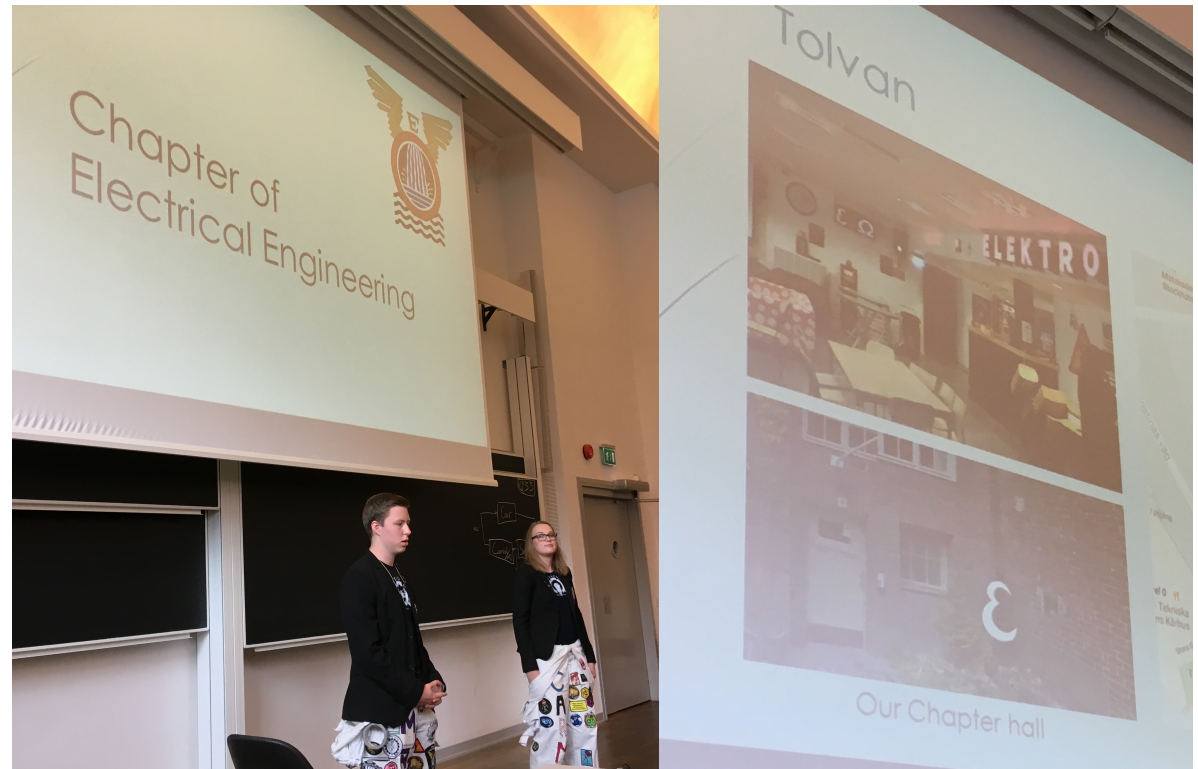
Reading email

- 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)



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

Questions?