



Master Kick off – Get to know your program

Master Systems and Control

Ann De Veirman – academic advisor S&C
Marika Koopmans – program coordinator S&C

August 2023

WHO ARE WE?

STAFF BEHIND THE SCENES – MASTER AT, S&C, SET



Hans Kuerten

*Program Director
ME, SET, S&C*



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*CSA officer AT, SET &
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Donk**

*Internationalization
officer ESA-ME*

INTRODUCTION MASTER PROGRAM S&C

- **Academic year agenda: how to prepare yourself!**
- Study management
- Coaching
- Student life at TU/e

Academic year agenda: Q1

Date	Activity
<ul style="list-style-type: none">• 27 August• 1 September (AKR)• 8 September: New TU/e students only	<p>Courses:</p> <ul style="list-style-type: none">• Closing date registration for courses quarter 1• Register yourself for two core courses and for one elective or specialization course in Osiris
4 September	Start courses
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September/October	CANS/RSI and Work safety (invitation will follow)
September/October	Student mentor meetings (invitation will follow)

Your first priority NOW: Registration of Q1 courses

- The deadlines for Q1:
 - deadline for course registration was Aug 27, AKR (administrative cost regulation; 20€) deadline is Sept 1 5PM. For new TU/e students (only!) the Q1 deadline is extended to Sept 8!
Send an e-mail to: esahelpdesk@tue.nl; Subject: 'aanmeldverzoek' followed by 'course code'.
 - Deadline for exam registration is Oct 16.
 - After the deadline registration is no longer possible!
- You have to register for your **courses and exams** in Osiris!
Attention: make sure to use the check mark 'exams' in Osiris.
- You are only allowed to take the exam with an exam registration (Osiris).
- You have to register for resits. This is not done automatically.

QUESTIONS? Contact esahelpdesk@tue.nl

Program overview & core program S&C

Q1	Q2	Q3	Q4
Control Engineering	Multi-body and Non-linear Dynamics	System Identification	Integration Project SC
System theory for control	Stochastic processes, filtering and estimation	Supervisory Control of Cyber Physical Systems	specialization/ elective
Modeling Dynamics	specialization/elective	specialization/ elective	specialization/ elective
Homologation/elective			

- **Students choose 5 out of 7 core courses (25 EC)**
- **Mandatory CBL team project (5 EC)**
- The modeling courses 5CSA0 and 4DM10 cannot both be included in the program of examinations. There is overlap.

- | | |
|----------|--|
| 1st year | • Core program (30 EC) |
| | • Specialization courses (15 EC) |
| | • Free electives (incl. homologation, 15 EC) |

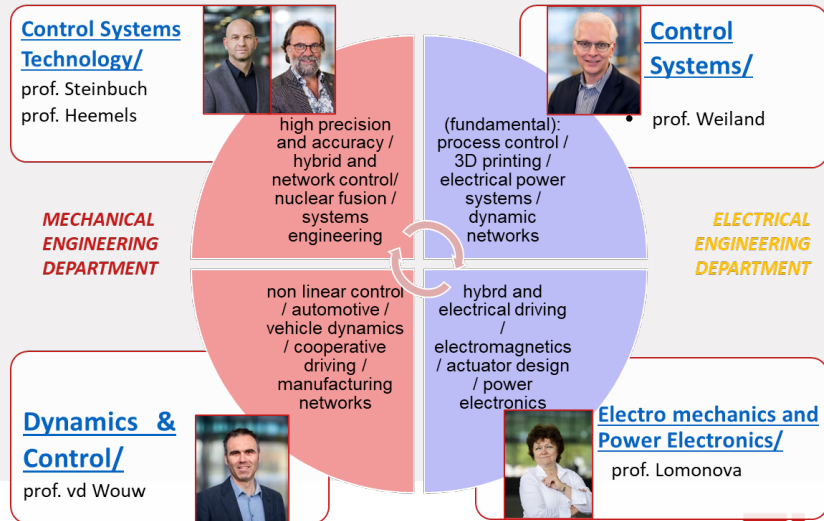
2nd year	Internship 15 EC	Graduation project 45 EC
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S&C student profiles & specialization

- The 4 sections/research groups involved in the S&C Master's program have created a number of student profiles
- These profiles are created to guide and assist students (the mentioned courses on the profiles are suggestions and are not mandatory!)

Overview student profiles S&C

Nr.	Name profile	Key phrase about profile	Section (department)
1	Estimation & Control of Energy Storage and Conversion Systems	Digital Twinning, constrained control, and estimation for energy storage and conversion systems	Control Systems (EE)
2	Control of Autonomous and Connected Systems	Intelligent control and decision making in autonomous and connected systems	
3	Digital Twinning and Data-Driven Learning	Modelling dynamic systems and data-driven learning for decision and control	
4	Control and Learning of High-Tech Systems	Performance enhancement through control and learning	
5	Energy Processing Control	Digital Twinning, constrained control, and estimation for energy storage and conversion systems	Electromechanics and Power Electronics (EE)
6	Control of High-Tech Systems & Mechatronics	Advanced modeling and control of complex high-tech mechatronic systems	Dynamics and Control (ME)
7	Cyber-Physical and Networked Systems	Modeling, diagnostics and control of cyber-physical systems	
8	Data-based Learning in Systems and Control	Using data and learning techniques to solve modeling, diagnostics, and control problems	
9	Robotics and Perception	Advanced Control, Modeling, Planning, and Perception for Manipulation	
10	Learning, Identification, and Control for High-Tech Systems	Data-driven control, robustness, learning, control performance optimization, motion control, for high-tech systems.	Control Systems Technology (ME)
11	Design for Precision Engineering	Design of mechatronic systems, construction principles, Opto-mechatronics, high-tech systems design	
12	Cyber-physical systems A. Cyber-physical systems: B. Supervisory control and model-based systems engineering	Hybrid systems and control, Networked systems, Security, safety & privacy, Event-triggered control, Supervisory control, Model-based systems engineering	
13	Robotics for Care, Cure, Agro-food & Trucks	Decision-making, perception, path planning, optimal state estimation, localization, world modelling, energy efficient control	
14	Automotive Powertrains & Smart Mobility	Optimal design and control of sustainable powertrains Autonomous Mobility-on-Demand.	Control Systems Technology (ME)
15	Process Control of Energy Systems	System identification & control for distributed parameter systems, model predictive control, supervisory control, (distributed) hybrid control	



SPECIALIZATION COURSES

- 15 EC for specialization courses
- Choose from the list 'courses MSc S&C 2023/24'
- Courses are linked to (offered by) a section and profiles
- You can choose **every** specialization course from the list!
- Most courses are 5 EC, some are 2.5 EC

Discuss with your mentor (in Q2) which courses suit your specialization and profile

The image shows a tilted view of a course catalog table for the MSc S&C 2023/24 program. The table is organized into four quarters (Quarter 1, Quarter 2, Quarter 3, and Quarter 4). Each quarter lists several courses with their respective credit values (EC) and some have red highlights. The courses are listed in columns, and the credit values are in the rightmost column. The table is tilted at an angle, making it difficult to read the specific course names and credit values.

Q1 courses S&C & student profiles

Profile				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
ME CST	4CM00	Control Engineering	C	5				✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
ME CST	4CM10 ^[1]	System theory for control	B	5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
EE CS	5CSA0 ^[2]	Modeling Dynamics	D	5	✓	✓	✓	✓	✓		✓				✓		✓	✓	✓
ME ET	4WM20	Homologation Matlab Simulink	E1	2.5															
ME D&C	4SC060	Homologation dynamics of mechanical systems	E2; E3	2.5															
ME D&C	4AT000 ^[5]	Vehicle Dynamics	B	5															
EE EPE	5LWE0	Control of Rotating-field Machines	A	5				✓											
EE EPE	5LWH0	Modelling & Control of power converters	C	5				✓											
BMT CB	8CM00 ^[5]	Systems Medicine	D	5															

1. CS-EE: Estimation & Control of Energy Storage & Conversion Systems
2. CS-EE: Control of Autonomous and Connected Systems
3. CS-EE: Digital Twinning and Data-Driven Learning
4. CS-EE: Control and Learning of High-Tech Systems
5. EPE-EE: Energy Processing Control
6. D&C-ME: Control of High-Tech Systems & Mechatronics
7. D&C-ME: Cyber-Physical and Networked Systems
8. D&C-ME: Data-based Learning in Systems and Control
9. D&C-ME: Robotics and Perception

10. CST-ME: Learning, identification and control for high-tech systems
11. CST-ME: Design for Precision Engineering
12. CST-ME: Cyber-Physical Systems
 - A. Cyber-Physical Systems
 - B. Supervisory control and model-based systems engineering
13. CST-ME: Robotics for Care, Cure, Agro-food & Trucks
14. CST-ME: Automotive Powertrains & Smart Mobility
15. CST-ME: Process Control of Energy Systems

COURSES: FREE ELECTIVES (15 EC)

Courses on Master level intended to broaden or deepen your knowledge

- extra specialization courses.
- all TU/e courses on Master level
- an extension of the internship with 5 EC
- deficiency courses (determined by the admission committee or in consultation with mentor)
- **homologation modules** that are offered for S&C, and complementary to the student's background

COURSES: FREE ELECTIVES (15 EC)

Be aware:

- No overlap between courses allowed (in free electives and specialization)
- You need approval of the courses

TU/e courses on Bachelor level only if:

- indicated as necessary by the department admission committee upon admission to the program and/or
- necessary as personal deficiency courses and/or
- necessary as homologation module for specific groups of students
- max 15EC; approval of examination committee required

HOMOLOGATION COURSES

Opportunity to work on deficiencies

- 4MW20 Matlab simulink (2.5 EC, Q1)
 - For international / non-TU/e students without matlab experience
- 4SE010 Heat, flow and thermodynamics (2.5 EC, Q1)
 - For BSc electrical engineering
 - Not needed for BSc Mechanical Engineering!

No permission of examination committee required, approval of mentor required

Academic year agenda: Q1

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MASTER ALLOCATION PROCEDURE (4MAPSC)

Implemented within the Department of Mechanical Engineering to allocate students to sections:

- affects students within the sections in the Department of Mechanical Engineering
- can also affect students choosing a section in one of the partner departments

For more detailed information go to educationguide.tue.nl

TIMELINE MAP (4MAPSC)

Specialization
meeting S&C
September 12
(Tuesday
afternoon)

Centrally organized specialization information meeting	Possibility for sections to organize an extra information meeting	<ul style="list-style-type: none"> ➤ 1st, 2nd and 3rd preference for a section in OSIRIS STUDENT: 4MAPSC ➤ Upload CV + motivation letter + questionnaire in CANVAS 	<ul style="list-style-type: none"> ➤ Selection round ➤ Allocation in second half of week 5
Week 2 of Q1	Week 3 – 4 of Q1 18 – 29 Sept	Deadline 2 Oct 2023, 9:00 AM <u>Open: Tuesday 19 Sept</u>	Week 5 of Q1 2 – 6 Oct

Academic year agenda: Q1

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CANS/RSI and Work safety ***For new TU/e students only***

Information meetings will be organized.

You will receive an invitation during the first quarter.

MANDATORY under Dutch law

Your presence will be checked

Looking ahead!

Student meetings – year 1 & 2

Goals:

- Sharing experiences at the TU/e and in the Master's program
- Sharing information about what you need to arrange for the next stage of your Master's program
- Community feeling



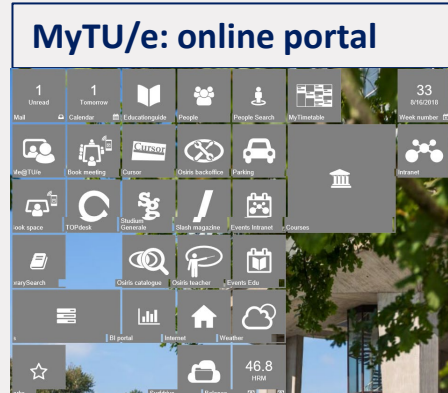
Topics Master Kick-off, Specialization and Q meetings:

Year 1: Master Kick-off (August)	Specialization meeting S&C (September 12 th)	Year 1: Q2 meeting (November)	Year 1: Q3 meeting (March)	Year 1: Q4 meeting (May)	Year 2: Q1 meeting (October)
<ul style="list-style-type: none">• Program Introduction• Study management & coaching• Information & support	<ul style="list-style-type: none">• Specialization choice - MAP• Information session about specialization options	<ul style="list-style-type: none">• Specialization choice• To do list• Registration exams and Q2 courses• Fraud basics• Evaluation	<ul style="list-style-type: none">• Quality assurance: NSE• Practicalities• How to find an internship?• Evaluation	<ul style="list-style-type: none">• How to organise your internship?• How and when to search for a graduation project?	<ul style="list-style-type: none">• How to organize the graduation project (online meeting)

INTRODUCTION MASTER PROGRAM S&C

- Academic year agenda: how to prepare yourself!
- **Study management**
- Coaching
- Student life at TU/e

ONLINE EDUCATIONAL SYSTEMS



Education guide: Program overview, elective courses list, homologation courses, procedures, examination committee, teaching and examination rules



Osiris: course and exam registration, progress overview



Canvas: Learning management system, course information, course materials, assignments, 4INFOSC, etc.



MyTimetable: personal time schedule

More information + videos: <https://educationguide.tue.nl/studying/services/online-systems/>

ONLINE EDUCATION GUIDE

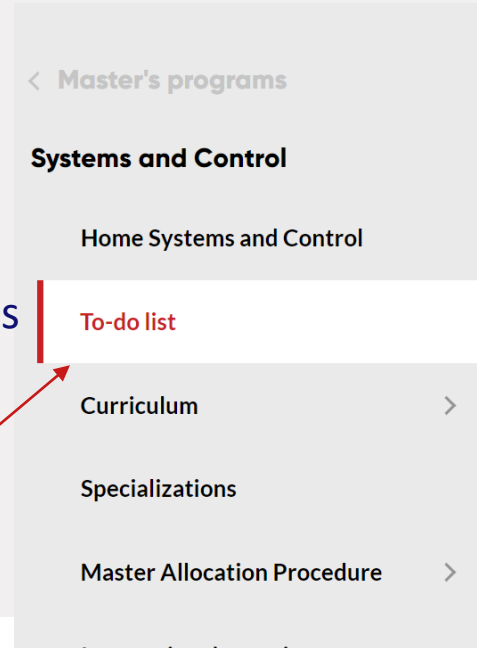
<https://educationguide.tue.nl/>

Go to: Programs > Graduate School > Master's Programs > Systems and Control

<https://educationguide.tue.nl/programs/graduate-school/masters-programs/systems-and-control/>

- Program overview
- Specialization courses list
- Homologation courses
- Procedures
- Examination committee
- Teaching and examination rules

Regularly check the [to-do list](#) !

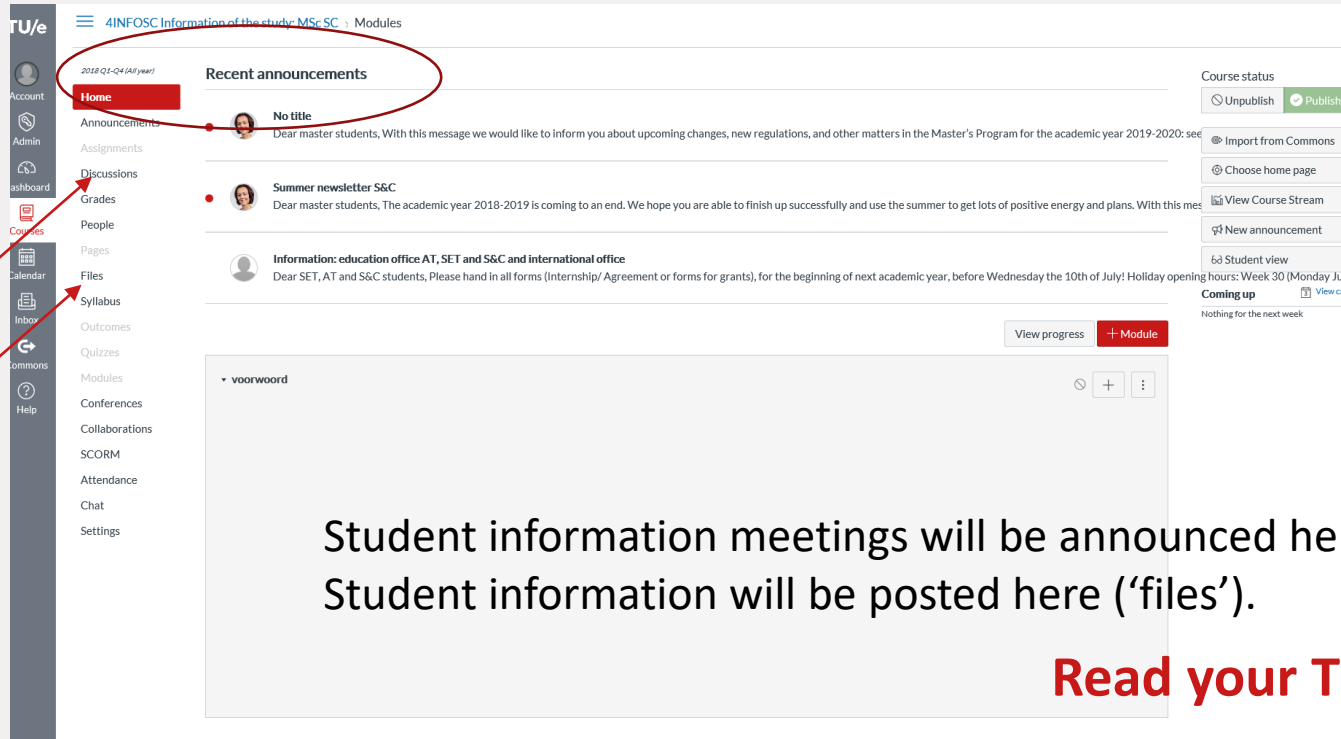


The to-do list guides you through all administrative tasks of your program. It tells you how to arrange each phase of your program, your internship, your graduation etc. It's very important to take your responsibility to make sure that you arrange all tasks in time, so that we're available if you encounter problems.

Please note that these are only administrative tasks. You also need to develop your skills and quality you need to meet to graduate (PER and ER).

[PDF] **TO DO list 2023-2024** 2

4INFOSC (CANVAS, MANDATORY)



4INFOSC Information of the study MSc SC Modules

2018 Q1-Q4 (All year)

Recent announcements

Home

No title
Dear master students, With this message we would like to inform you about upcoming changes, new regulations, and other matters in the Master's Program for the academic year 2019-2020: see

Summer newsletter S&C
Dear master students, The academic year 2018-2019 is coming to an end. We hope you are able to finish up successfully and use the summer to get lots of positive energy and plans. With this mes

Information: education office AT, SET and S&C and international office
Dear SET, AT and S&C students, Please hand in all forms (Internship/ Agreement or forms for grants), for the beginning of next academic year, before Wednesday the 10th of July! Holiday opening hours: Week 30 (Monday July

View progress + Module

voorwoord

Student information meetings will be announced here.
Student information will be posted here (‘files’).

You will be added
to the course, if not
do it yourself!!!!

Read your TU/e mail!

Study management: the PSV approach

Prioritize-Specify-Visualize



Prioritize:

- Register for 15EC courses
 - 15EC courses requires 420 study hours (1EC = 28 hours)
 - 20EC is allowed, but not recommended
- Make a priority list: which course is the most important to pass this Q?
 - It is recommended to focus first on the core and homologation courses.

Why such a priority list?

If the workload is too high, you can drop the course that is lowest on your priority list.

There may be foreseeable and unforeseen reasons why the workload in a Q is too high for you (think about illness, other non-study related activities, etc)

Study management: the PSV approach

Prioritize-Specify-Visualize



Specify

- Each course of 5EC requires 140 study hours
- Specify what you need to do for this course: e.g. follow lectures or read the lecture slides, work out your lecture notes (after the lecture), make assignments, look for more information in the textbook, attend and prepare meetings with peers (project courses)
- Estimate for every activity how much time that is going to cost you (weekly) and indicate when extra time is required to meet deadlines for assignments or interim exams.
- If you find it difficult to plan, you can
 - Discuss with peers
 - Plan a meeting with the academic advisor ([via this link](#))
 - Consider to contact [the study management advisor](#) and to follow a study management training

Study management: the PSV approach

Prioritize-Specify-Visualize



Visualize

- Put the activity blocks in a visual 10-week agenda (1Q = 10 weeks)
 - Include lectures, guided self-study, exams
 - Indicate if they are **on-campus or online** (information to be found in Canvas)
 - Allow yourself some free time for sports, leisure, meeting friends etc.
 - For Q1: do not forget to plan the MAP activities

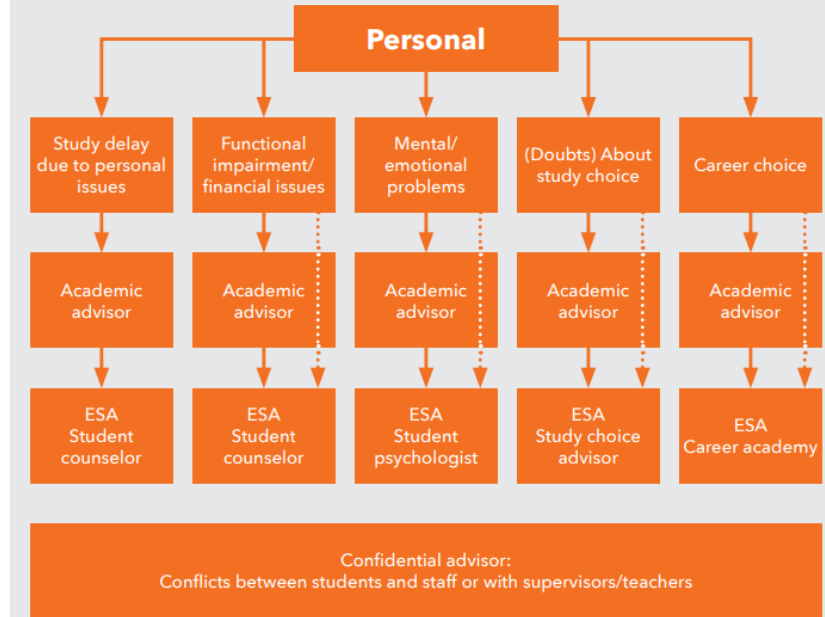
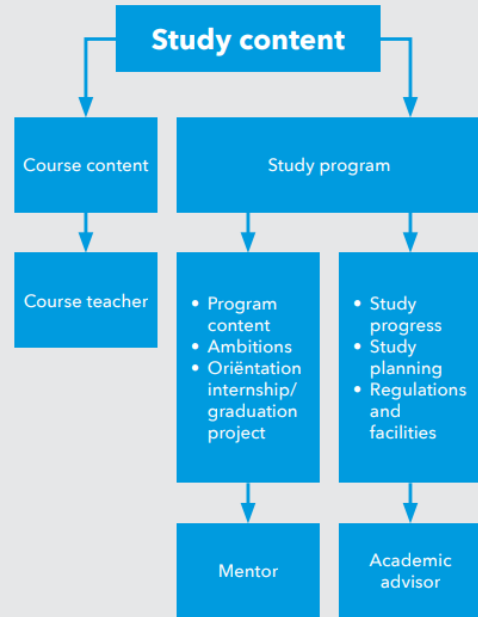
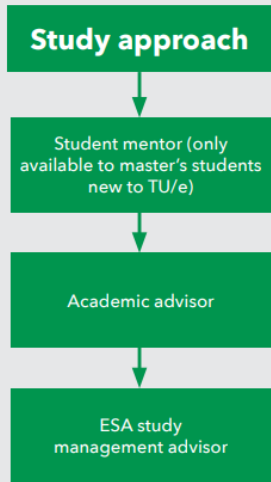
If the conclusion is that your agenda is too full, go back to P (PSV is an iterative approach)

USE THE PSV APPROACH BEFORE THE START OF EACH Q

INTRODUCTION MASTER PROGRAM S&C

- Academic year agenda: how to prepare yourself!
- Study management
- **Coaching**
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Student guidance for master's students



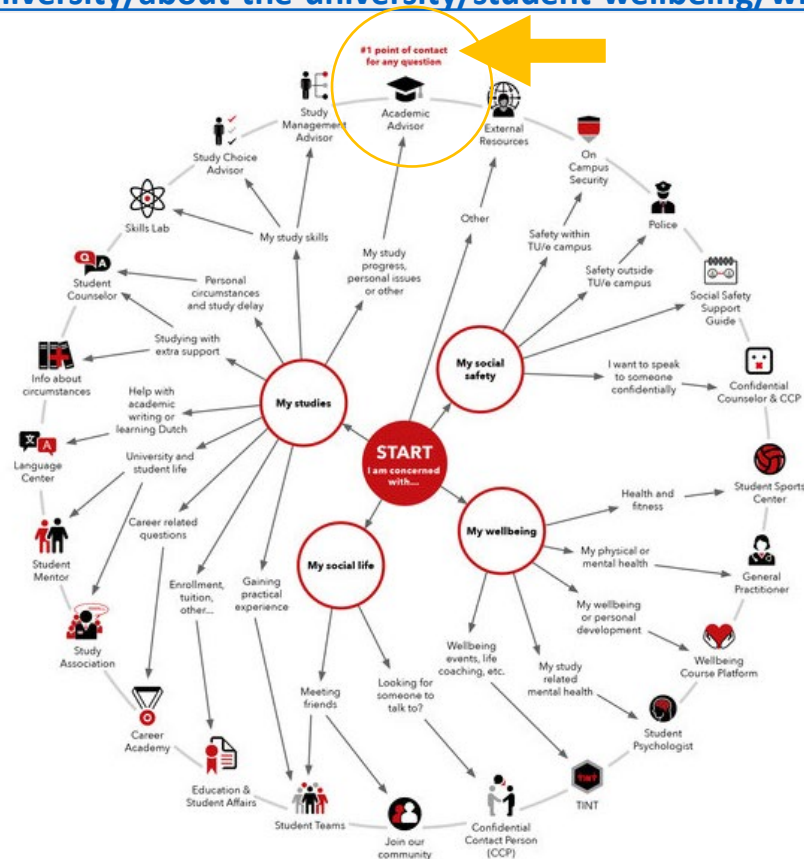
Also check: <https://www.tue.nl/en/our-university/about-the-university/student-wellbeing>

More information? Check it on the [student guidance page](#). Also have a look at the **group training sessions** we offer.

Not sure where to go? Contact your academic advisor.

Where to find support?

<https://www.tue.nl/en/our-university/about-the-university/student-wellbeing/where-to-find-support>



COACHING – STUDY APPROACH – PROGRESS - PERSONAL

Academic advisor: Ann De Veirman (me.academic.advisor.at.sc.set@tue.nl)

- Advice and help to enhance study progress (also in case of personal issues)
- Information about the regulations and how to organise your study
- Personal and confidential appointments

Please do not use my personal email address

- Read first the information in the education guide and on Canvas
- Ask specific questions
- Always mention your name, program (MSc S&C) and student ID
- **Contact us in time**

COACHING – STUDY APPROACH

Student mentor (for students NEW at the TU/e):

- Supports you in finding your way at TU/e, the campus and the city of Eindhoven
- First point of contact in your first week at TU/e
- Organizes several group and individual meetings (attendance is recommended)
- Various topics will be covered (study, culture, education systems, exams, sports & leisure, etc.)

There are 3 student mentors (Anagha, Kowstuba and Samarth).

NEW THIS YEAR:

The student mentors will also organize an activity for all MSc S&C students.

Goal: to help you to get to know all students in your MSc program (also those who did their BSc at the TU/e and 2nd year MSc).

COACHING – STUDY CONTENT

Mentor (academic staff member)

- Guides you in choosing your specialization electives and in compiling your curriculum
- Guides you in making a choice for an internship & graduation project and in finding a subject and location
- Discusses your plans to improve your professional skills
- Supports you in thinking about your career path

Internship supervisor: Is responsible for your graduation project (can be your mentor)

Thesis supervisor: Is responsible for your graduation project (can be your mentor or internship supervisor)

INTRODUCTION MASTER PROGRAM S&C

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Student life at TU/e

- Simon Stevin, study association Mechanical Engineering (lunch lectures for MSc students)
- EIRES: Energy lectures
- Cosmos, international students
- Students Sport Centre
- Student teams
- Teaching assistant
-

*Questions? Discuss with
your student mentor!*

If you have additional questions ...

- Contact the academic advisor (Ann De Veirman)
E-mail: me.academic.advisor.at.sc.set@tue.nl