Master Kick off – Get to know your program
Master Systems and Control

Ann De Veirman – academic advisor S&C

August 2024

WHO ARE WE?

STAFF BEHIND THE SCENES – MASTER S&C

				
	Yves Houben	**Ann De Veirman**	**Paul Klijn**	**Lizzi Akintola**
Program Director ME, SET, S&C	*Manager ESA-ME*	*Academic Advisor AT, S&C*	Secretary Excie *AT, SET, S&C*	*Program Coordinator AT, S&C, SET*

WELCOME!

INTRODUCTION MASTER PROGRAM S&C

- **Academic year agenda: how to prepare yourself!**
- Study management
- Student guidance
- Program Committee S&C

Academic year agenda: Q1

Date	Activity
Registration: 15 Jun to 25 Aug **AKR: 26 Aug to 30 Aug** **New TU/e students: 6 Sep**	**Courses:** • **Closing date registration for courses quarter 1** • **Register yourself for two core courses and for one elective or specialization course in Osiris**
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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 25, AKR (administrative cost regulation; 20€) deadline is Aug 30 5 PM.
  - Deadline for exam registration is Oct 15.
  - After the deadline registration is no longer possible!
  - For new TU/e students (only!) the Q1 deadline is extended to Sept 6! Send an e-mail to: esahelpdesk@tue.nl; Subject: 'Q1 course registration (1st enrollment at TU/e)' followed by 'course code'.

- You have to register for your **courses and exams** in Osiris!
  Attention: check your exam registration 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 4CM00	Multi-body and Non-linear Dynamics 4DM10	System Identification 5SMB0	Integration Project SC 5SC26
System theory for control 4CM10	Stochastic processes, filtering and estimation 5SC29	Supervisory Control of Cyber Physical Systems 4SC080	specialization/ elective
Modeling Dynamics 5CSA0	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

S&C student profiles & specialization

The 5 sections/research groups involved in the S&C Master's program have created a number of student profiles to guide and assist students

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
6	Control of High-Tech Systems & Mechatronics	Advanced modeling and control of complex high-tech mechatronic systems	Dynamics and Control
7	Cyber-Physical and Networked Systems	Modelling, diagnostics and control of cyber-pysical systems	
8	Data Based Learning in Systems and Control	Using data and learning techniques to solve modelling, diagnostic and control problems	
9	Robotics and Perception	Advanced control Modelling , Planning, and Perception for Manipulation.	Robotics
10	Robotics for Care, Cure, Agro-food and Trucks	Decision-making, perception, path planning, optimal state estimation, lacalization, world modelling, energy effiicient control.	
11	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)
12	Design for Precision Engineering	Design of mechatronic systems, construction principles, Opto mechatronics, high-tech systems design	
13	Cyber-Physical Systems A. Cyber-physical Sysytems: B. Supervisory control and mondel based systems engineering	Hybrid systems and control, Networked systems, Security, safety & privacy, Event- triggered control, Supervisory control, Model based systems endgineering	
14	Automotive Powertrains & Smart Mobility	Optimal design and control of sustainable powertrains Autonomous Mobility-on-Demand.	
15	Process Control of Energy Systems	System identification & control for distributed parameter systems, model predictive contrtol, supervisory control, (distributed) hybrid control	

Overview core courses versus profiles S&C

Core Course	Q	1	2	3	4	5	6	7	8	9	10	11	12	13 A.	13 B.	14	15
Control Engineering	1				✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
System theory for control	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Modeling Dynamics	1	✓	✓	✓	✓	✓		✓			✓			✓		✓	✓
Multi-body and Non-linear Dynamics	2					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Stochastic Processes, filtering and estimation	2	✓	✓	✓	✓				✓	✓	✓	✓		✓	✓		✓
Supervisory Control of Cyber Physical Systems	3	✓	✓						✓		✓	✓	✓	✓	✓		✓
System Identification	3	✓		✓	✓	✓			✓			✓			✓		✓

Profiles:

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

TU/e

SPECIALIZATION COURSES

- 15 EC for specialization courses
- Choose from the list ‘Overview core and specialization courses S&C 2024/25’
- 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

Q1 courses S&C & student profiles

Profile					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
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 D&C	4SC060	Homologation dynamics of mechanical systems	E2;E3	2.5															
ME D&C	4AT090	Smart Vehicles	B	5															
EE EPE	5LWE0	Control of Rotating-field Machines	A	5					✓										
EE EPE	5LWH0	Modelling & Control of power converters	C	5					✓										

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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 (no overlap between courses allowed)
- an extension of the internship with 5 EC
- deficiency courses (determined by the admission committee or in consultation with mentor)
- **The homologation course** that is offered for S&C: 4SC060 Homologation dynamics of mechanical systems (only for BSc electrical engineering)

- One suggestion for students taking the homologation module 4SC060 (2.5EC): 4WM10 (Career development; 2.5EC)

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MASTER ALLOCATION PROCEDURE (4MAPSC)

Allocation of students to sections

For more detailed information go to educationguide.tue.nl

Centrallly organized specialization information meeting	Possibility for research sections to organize extra information meeting	Upload CV and motivation letter in Canvas (4MAPSC) for preferred section	Allocation of students to research sections
Week 2 of Q1 10 Sept Tuesday afternoon	Week 3-4 of Q1 16-27 Sept	Open: Tuesday 17 Sept Deadline: Sunday 29 Sept 23:59	End of week 5 of Q1 2-3 Oct

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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 via 4INFOSC in Q1.

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 10th)	Year 1: Q2 meeting (Nov/Dec)	Year 1: Q3 meeting (March)	Year 1: Q4 meeting (May)	Year 2: Q1 meeting (Sept/October)
• Program Introduction • Study management & coaching • Information & support	• Specialization choice - MAP • Information session about specialization options	• Specialization choice • To do list • Registration exams and Q2 courses • Fraud basics • Evaluation	• Quality assurance: NSE • Practicalities • **How to find an internship?** • Evaluation	• **How to organise your internship?** • How and when to search for a graduation project?	• How to organize the graduation project (online meeting)

INTRODUCTION MASTER PROGRAM S&C

- Academic year agenda: how to prepare yourself!
- **Study management**
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ONLINE EDUCATIONAL SYSTEMS

MyTU/e: online portal

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.

TE Timetable: personal time schedule

More information + videos: https://educationguide.tue.nl/practical-info/it-services/online-systems

ONLINE EDUCATION GUIDE

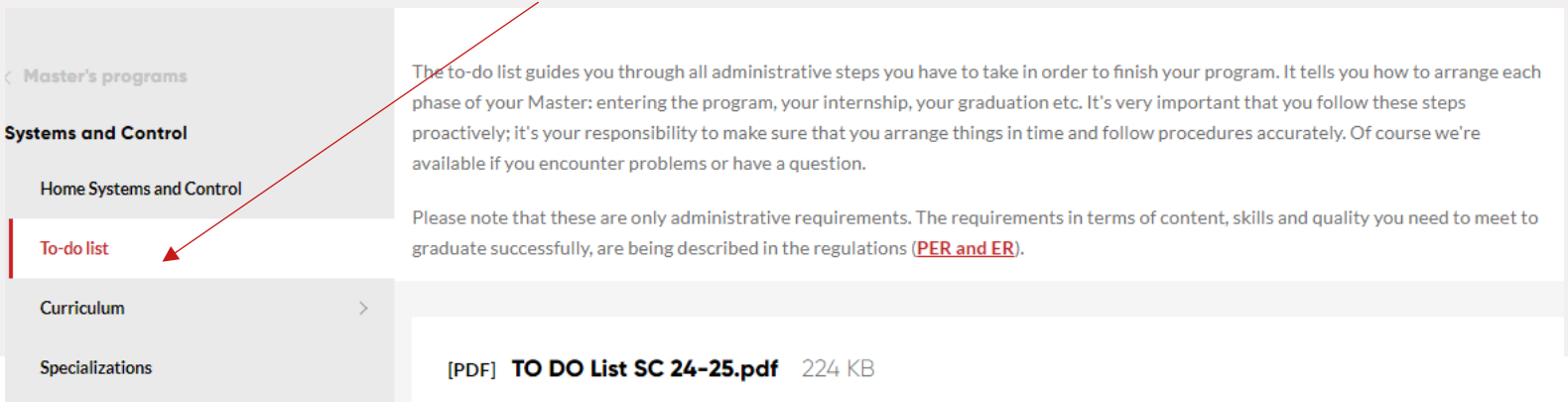
https://educationguide.tue.nl/

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

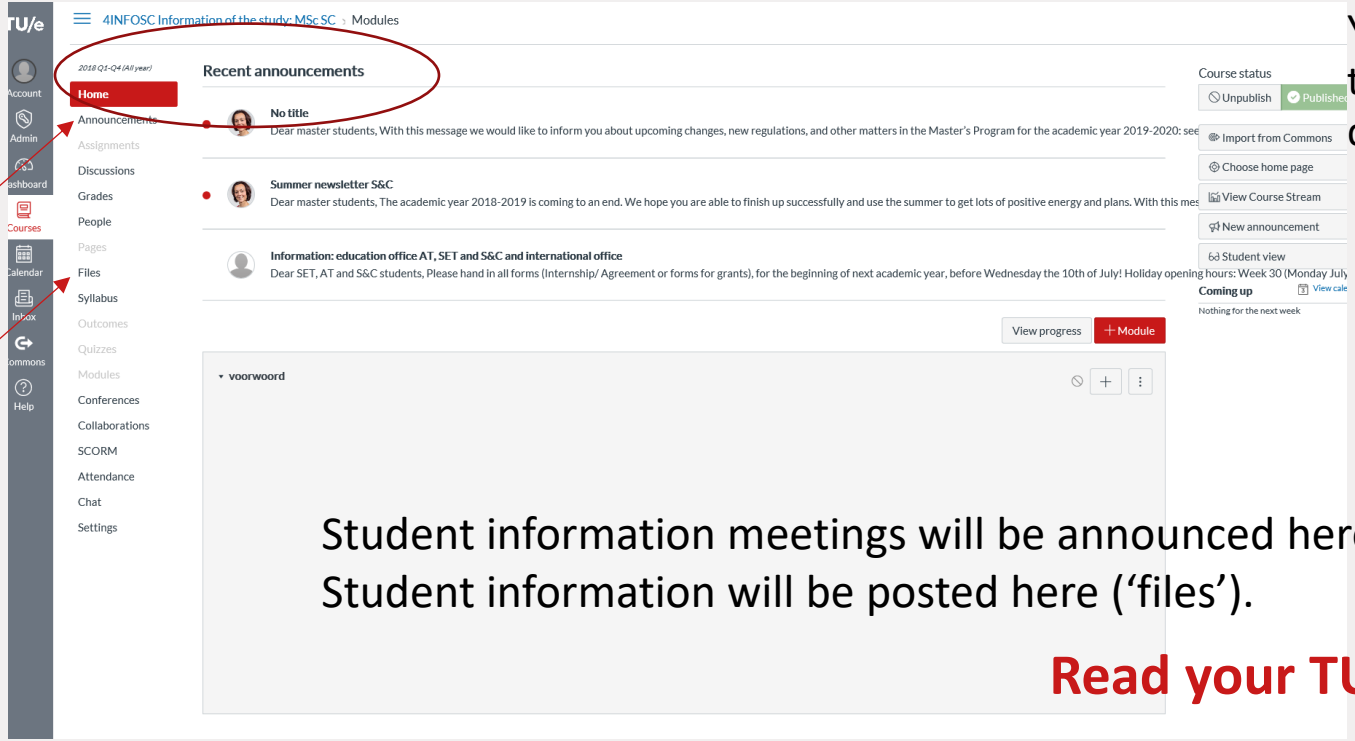
https://educationguide.tue.nl/programs/graduate-school/masters-programs/systems-and-control/

- Curriculum
  - Specialization courses list
  - Homologation courses
- Procedures
- Examination committee

Regularly check the to-do list !



4INFOSC (CANVAS, MANDATORY)



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

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

Read your TU/e mail!

Study management: the PSV approach
Prioritize-Specify-Visualize

Prioritize:

- Register for 15EC courses (the academic year = 4Q's)
  - 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

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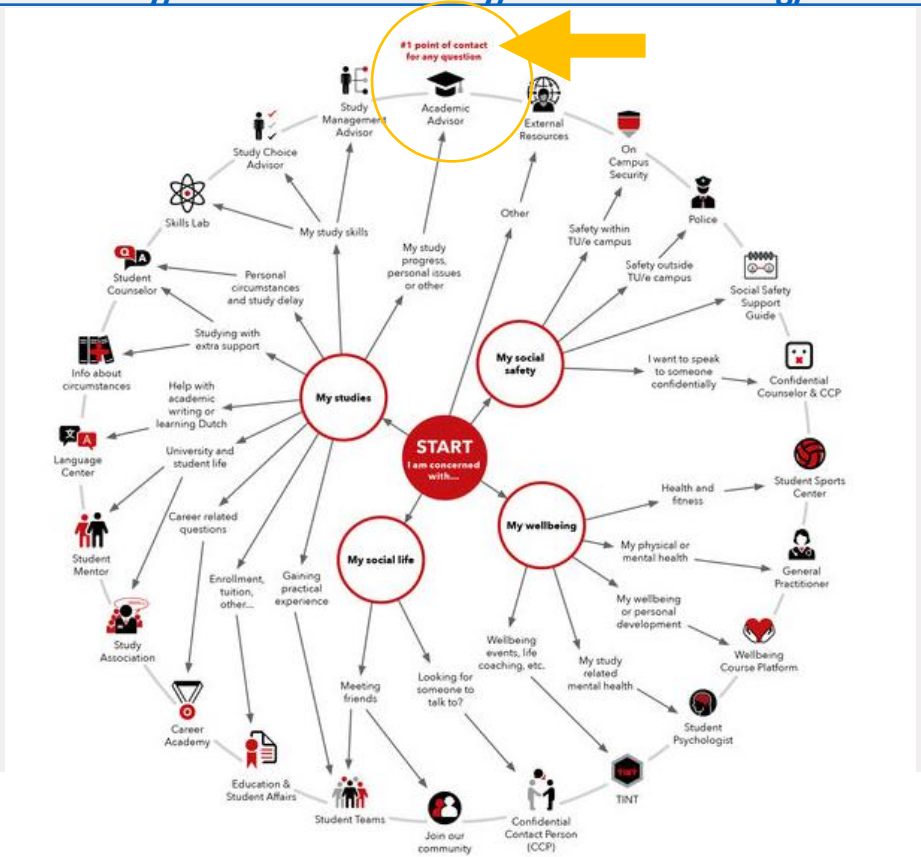
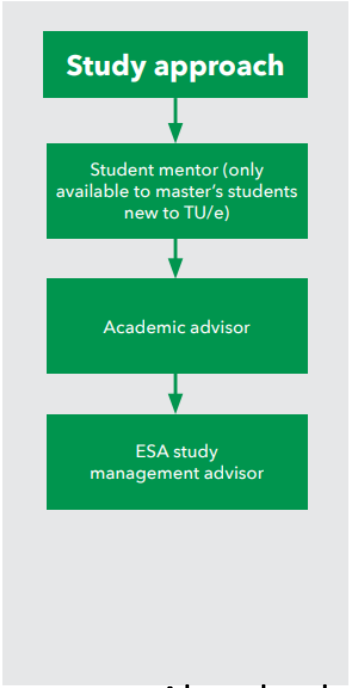
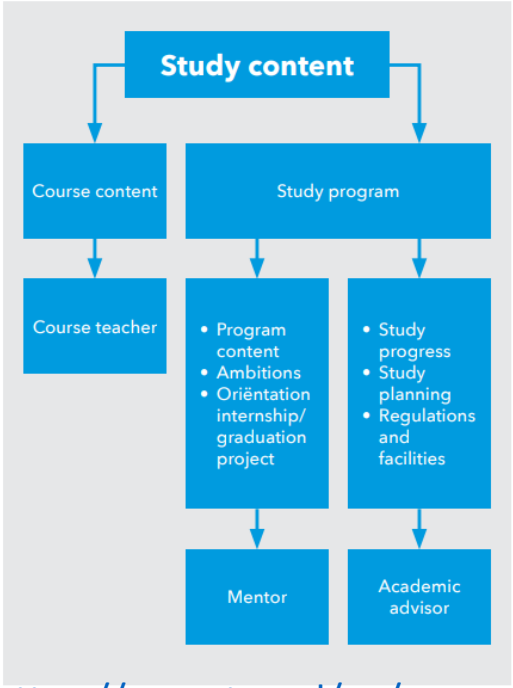
Where to find support?

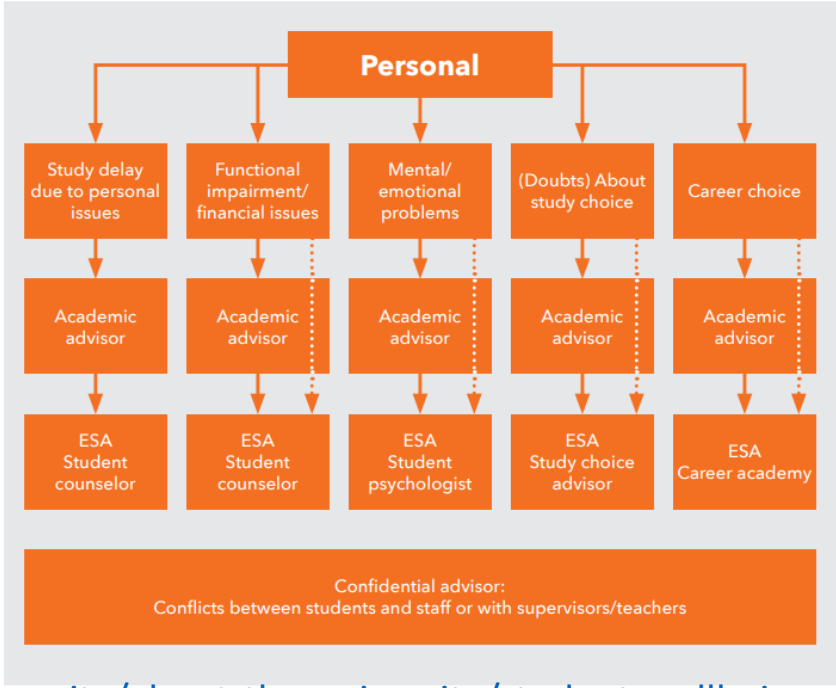
https://www.tue.nl/en/our-university/about-the-university/student-wellbeing/where-to-find-support



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.

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 an 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**

…and come to the 4INFOSC student meetings in Q1 Q2 & Q3

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.)

The student mentor for S&C is Sarthak.

COACHING – STUDY CONTENT

Mentor (academic staff member) – related to your specialization

- 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 internship project (can be your mentor)

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

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- **Program Committee S&C**

Master SC – Program Committee (OCSC)

(Opleidings Commissies Systems en Control)

Eashwar Ravikkumar, Sarthak Shirke

28th August, 2024

Program Committee Systems and Control

What does OCSC do?

- SC program quality assurance
- Course program
- PER (Program and Examination Regulations)
- Conduct student well-being activities

Why should you participate?

- Program quality & reputation directly impacts your future opportunities
- The better the quality of the program, more prepare you are for industry or academia
- Skills development

Program Committee Systems and Control

OCSC members

Staff members

- Tijs Donkers (Chairman)
- Michelle Chong
- Sebastian Eijnden
- Hans Kuerten
- Marike Koopmans
- Rosanne Jansen
- Elise Lieshout

Student members

- Eashwar Ravikkumar
  e.ravikkumar@student.tue.nl
- Ruben Dragt
  w.r.dragt@student.tue.nl
- Sarthak Shirke
  s.u.shirke@student.tue.nl

Program Committee Systems and Control

Community drinks
(Master System and Control)

5th July, 2024

Program Committee Systems and Control

Thank you!

Q&A

ENJOY YOUR MSC PROGRAM!