Courses MSc Systems and Control 2024/25

TU/e EINDHOVEN UNIVERSITY OF TECHNOLOGY

Core course

Students choose 5 out of 7 core courses (25 EC). The modeling courses 5CSA0 and 4DM10 cannot both be included in the program of examinations, due to overlap.

- The course 4DM10 focuses on 1) the dynamic modeling and analysis of mechanical systems which is key in the fields of robotics, vehicle dynamics, high-tech systems and control of mechanical systems and 2) the analysis of generic nonlinear dynamical systems.
- The course 5CSA0 covers a broad scope of applications and treats the modeling and analysis of general physical models, networks of models, the role of passivity and conservation laws and a broad range of stability properties in nonlinear dynamics.

The Integratition project S&C (5SC26, 5EC) is mandatory for all S&C students.

Homologation course

Homologation modules are part of free electives. The total amount of bachelor and homologation courses may not exceed 15 EC. Homologation is strongly advised, depending on student's background. See information at the online education guide for target groups.

Specialization course

Students need to choose at least 15 EC of specialization courses from this list. Core courses can also be chosen as specialization elective. .

Quarter 1

				Timeslot	credits
ME Control Systems Technology	4CM00	Control Engineering		C	5
ME Control Systems Technology	4CM10[1]	System theory for control		B	5
EE Control Systems	5CSA0[2]	Modeling Dynamics		D	5
ME Dynamics and Control	4SC060	Homologation dynamics of mechanical systems		E2; E3	2.5
ME Dynamics and Control	4AT090	Smart Vehicles		B	5
EE Electromechanics and Power Electronics	5LWE0	Control of Rotating-field Machines		A	5
EE Electromechanics and Power Electronics	5LWH0	Modelling & Control of power converters		C	5

Quarter 2

ME Dynamics and Control	4DM10 [2]	Multibody and Non-linear Dynamics*		A	5
EE Control Systems	5SC29	Stochastic processes, filtering and estimation		E	5
ME Control Systems Technology	4CM60	Advanced Motion Control		B	5
ME Control Systems Technology	4SC000	Optimal control and reinforcement learning		D	5
ME Dynamics and control	4DM10	Multibody and non-linear dynamics		5	A
ME Robotics	4TM00	Robot motion planning and control		5	C
EE Control Systems	5LMA0	Model reduction		C	5
EE Control Systems	5SMC0[1]	Control principles for engineered systems		D1	5
EE Electromechanics and Power Electronics	5SWA0[3]	Rotary Permanent Magnet Machines		D	5
EE Electromechanics and Power Electronics	5AT010	Electrical Components (1/2 Powertrains 4AT060)		C2	2.5
EE Electromechanics and Power Electronics	5SWC0[3]	Linear and planar motors for high-precision systems		D	5

Quarter 3

EE Control Systems	5SMB0	System Identification		C	5
ME Control Systems Technology	4SC080	Supervisory Control of Cyber-Physical Systems		D	5
ME Dynamics and Control	4AT000[5]	Vehicle Dynamics		C	5
ME Dynamics and Control	4DM30	Non-linear Control		A	5
ME Control Systems Technology	4DM20	Engineering Optimization		B	5
ME Control Systems Technology	4CM120	Extremum Seeking Control for data-based performance optimization		E	5
ME Control Systems Technology	4CM40[5]	Physical and data-driven modelling		D	5
ME Control Systems Technology	4SC090	Control and operation of future energy system		D	5
ME Energy Technology	4EM30	Scientific Computing for Mechanical Engineering		B	5
ME Energy Technology	4EM90	Modelling high-tech systems with thermo mechanical effects		E	5
EE Control Systems	5LMC0	Robust Control		E	5
EE Control Systems	5LMB0	Model predictive Control		A1	5
EE Control Systems	5LMG0	Advanced Process Control		A2	5
EE Electromechanics and Power Electronics	5SWB0	Advanced Power Electronics		A	5
EE Electronic Systems	5LIJ0	Embedded Control Systems		E1	5
BMT CB	8CM00[5]	Systems Medicine		B2	5

Quarter 4

EE Control Systems	5SC26	Integration Project SC		E	5
ME Dynamics and Control	4DM40	Modelling and control of manufacturing networks		A	5
ME Dynamics and Control	4SC050	Performance of Nonlinear Control Systems		A	5
ME Dynamics and Control	4DM70	Analysis and design of networked dynamical systems		B	5
ME Dynamics and Control	4AT080	Vehicle control		B	5
ME Control Systems Technology	4SC100	Haptics - perception and technology		A	5
ME Control Systems Technology / Dynamics and Control	4CM20	Hybrid systems and control		C	5
ME Control Systems Technology	4AT030	Advanced full-electric and hybrid powertrain design		C	5
ME Control Systems Technology	4SC070[4]	Learning control		D	5
ME Control Systems Technology	4SC020[4]	Mobile Robot Control		D2; D3	5
ME Control Systems Technology	4AT070	Advanced control for future HD powertrains		D	5
ME Control Systems Technology	4DM80	Fault Detection and Isolation (FDI) in High-Tech Systems		B1	2.5
EE Control Systems	5LMD0[5]	Selected Topics in S&C - *course will not be offered in 2024/25*		E2	2.5
EE Control Systems	5SC28	Machine learning for Systems and Control		B	5
EE Electromechanics and Power Electronics	5LWC0	Advanced actuator design		A1	5
EE Electromechanics and Power Electronics	5LWG0	Power electronics for high-precision applications		B2	5

Check actual information about quarter

[1] To avoid the (partial) content overlap with the course System theory for control (4CM10), students who follow 4CM10 and 5SMCO will be offered a parallel module.

[2] The modeling courses 5CSA0 and 4DM10 cannot both be included in the program of examinations, due to overlap.

[3] Both courses can be followed simultaneously in timeslot D

[4] Both courses can be followed simultaneously in timeslot D

[5] This course is scheduled in the same timeslot as a core course