

# Systems & Control

## MSc Programme



As the complexity and importance of our many industrial structures and manufacturing systems grow, so does the guiding hand of Systems and Control. This active research area is an important discipline in many fields, involving such specialists as engineers, physicists, mathematicians and designers. The world of systems and control guides more of our lives than most of us realise. Areas as diverse as the manufacturing and semiconductor industry, infrastructure management, transportation, communications and logistics, energy delivery, the medical profession, and the family household are increasingly dependent on it. And as the world becomes more and more automated and guided, its impacts will spread even further.

<b>Degree</b>	Master of Science in Systems & Control
<b>Starts</b>	September
<b>Credits</b>	120 ECTS, 24 months
<b>Language</b>	English
<b>Application deadline</b>	April 1st: international students July 1st: Dutch degree
<b>Tuition fee</b>	€ 18.750 (non EU) € 2.083 (EU)
<b>Scholarships</b>	<a href="https://www.tudelft.nl/scholarships">scholarships.tudelft.nl</a>

The two-year MSc programme in Systems and Control trains students to use interdisciplinary strategies involving modelling, signal processing, controller design, and system analysis. It prepares engineers for a key role in the field of dynamics and control technology for complex systems and processes. The programme provides top quality and skills for successful professional careers in research, technology development and design. For students who wish to expand their academic career the MSc programme is the perfect preparation for the national graduate (PhD) programme of the Dutch Institute of Systems and Control (DISC) as well as other PhD programmes.

The programme is aimed at students with a technical BSc background interested in analysis and control of dynamic systems in their widest sense. It addresses both fundamental and application-specific features, emphasising the multidisciplinary character of the field. It gives attention to applications in mechanical engineering, electrical engineering, applied physics, chemical and aerospace engineering.

Combining the disciplines above results in an interdisciplinary approach, with attention given to modelling, experimental design, mathematical system theory, signal analysis and processing, model based control design, and

First Year		Second Year	
<b>First semester</b>		Literature study	15 ECTS
Introduction project SC	3 ECTS		
Control theory DCSC	6 ECTS		
Filtering & identification	6 ECTS		
Optimization in systems and control	4 ECTS		
Nonlinear Systems Theory	4 ECTS		
Philosophy of Engineering Science and Design	3 ECTS		
<b>Second semester</b>		Master thesis project	45 ECTS
Robust and Multivariable Control Design	6 ECTS		
Integration project SC	5 ECTS		
Systems and Control electives	≥ 18 ECTS		
Free electives	≥ 6 ECTS		

hardware and software systems. For systems of high complexity, such as highorder, non-linear or time-delay dynamics, hybrid and embedded systems, study targets range from small-scale micro-systems to largescale industrial processes. An MSc degree in Systems and Control will surely be a key engineering qualification for future decades.

## Specialisations

Due to the diversity of participating groups and flexible setup, the MSc programme can offer many specialisations, ranging from a pure engineering profile to more theoretical oriented research. Teaching and research at DCSC (Delft Center for Systems and Control) encompasses the wide area of modelling, estimation and identification, control and optimisation of linear, non-linear and hybrid dynamical systems. Applications include mechatronics and microsystems, sustainable industrial processes, transportation and traffic control, adaptive optics, automotive applications, and physical imaging systems. DCSC has extensive laboratory facilities and participates in many collaborative research projects with industrial partners.

## Curriculum

The MSc programme in Systems and Control is a two-year curriculum of lectures and assignments. The course section consists of a compulsory part, an elective part in which modules are chosen from a list of systems and control modules, and a freely selected part chosen

in consultation with the MSc coordinator and the MSc thesis supervisor. Within the elective courses students have various specialisation options, for instance mechanical systems, process control, automotive, robotics, wind energy, transportation networks, smart physical systems, systems and control theory.

## Graduation examples

- Model based Control design of adaptive optics for confocal microscope with biological specimen
- Model predictive traffic control: Efficiency versus accuracy
- Towards data-driven autonomous control systems in the process industry.
- Large perturbation recovery for bipedal robots

## Career prospects

Programme graduates find careers across numerous sectors of industry and academia which range from management to design, research and development in technical departments. In our technologically developed society, commercial and governmental organisations are in constant need of people with a solid engineering education at the academic level, and this need will surely grow. Because of system complexity, an increasing number of engineers are playing a crucial role in the advising on and selling of smart products and capital equipment. Naturally there are also numerous careers awaiting systems and control engineers in academia, where these skills are in high demand as well.



Best master's programme of the year in 2010



25% international students



4TU study programme

Career perspective



95% has a job within a month



80% has a job as systems & control engineer