



## Motion control tuning

**This training starts on: 08-04-2015**

**Location:** TU/e, Eindhoven  
**Price:** 4.495,00 euro excl. VAT  
**Duration:** 6 days in a period of 2 weeks  
**Contact:** training@hightechinstitute.nl, +31 85 401 3600

### Overview

The performance of controlled mechanical servosystems in an industrial setting is generally achieved by using PID controllers. In systems that suffer from dynamics and vibrations it is often useful to use additional filters, like notch-filters. The application of frequency domain techniques for analyzing requirements, describing controllers and carrying out experiments to find the optimal settings is very useful and will be treated during this course.

Starting with the time domain, the complete basis of control is repeated, placed in a modern framework, validated experimentally and applied to mechanical servo systems. During the course all aspects of 'motion control' are covered, including the use of feedforward steering.

After completion of the course you understand time and frequency techniques that are used in control and you are able to analyse industrial servo systems and determine proper settings for the controller. Next to tuning of the controller, you will be able to judge what the maximum performance is and which aspect is the limiting factor. Also you will gain practical experience with implementation and analysis instrumentation.

### Intended for

This course focuses at engineers that are involved in controlled mechanical servo systems and want to gain more insight into the possibilities and limitations of servo control in an industrial setting. Participants have a Bachelor or Master education in electrical engineering, mechanical engineering, mechatronics, physics or equivalent practical experience and need some basic understanding of servo control.

### Programme

The course consists of a mixture of lectures, demonstrations, exercises and experiments. For the exercises a userfriendly Matlab application is used, whereas the experiments are performed with RTLinux based instrumentation.

The following topics are covered:

- Modelling of mechanical servo systems
- Time domain tuning
- Introduction frequency domain
- Stability
- Experimenting in the frequency domain
- Mechanical design for servo control
- Filters
- Design competition
- Design for performance
- Feedforward steering

### Partner

Mechatronics Academy B.V.

### Certification

Participants receive a HTI certificate. This course is part of the Certified Precision Engineer program of the Dutch Society for Precision Engineering (DSPE).

### Course leaders

Prof.dr.ir. Maarten Steinbuch  
Dr.ir. Ton van der Weiden

### Teachers

Prof.dr.ir. Maarten Steinbuch  
Dr.ir. Ton van der Weiden  
Ir. Michiel Vervoordeldonk  
Dr.ir. Pieter Nuij  
Dr.ir. Tom Oomen  
Ir. Frank Sperling  
Dr.ir. Michael Ronde  
Ir. Joost Bolder  
Ir. Rick van der Maas  
Dr.ir. Marc van de Wal  
Dr.ir. Gert Witvoet  
Ir. Pieter Teerhuis  
Ir. Tom Gommans

### Timetable

To be determined.

- Digital control
- Interaction between control loops
- Robust and learning control