

## Course Overview

Modern controller design is really all about modelling. If you can establish a suitable model, then the controller design becomes almost automatic. In this course on controller design, we will cover the basics of feedback control, and show how to select and configure common controllers for common, and the not so common, applications.

Controller design, like most engineering design, is an iterative process. That means ideally we desire tools that allow us to rapidly explore different structural options, different controller tuning algorithms, and the consequences of different assumptions, all with an intuitive, easy to use interface. The MATLAB and Simulink tools provide such a development environment. You can then spend more time thinking about your actual control problem as opposed to do repetitive, tedious calculations.

## Who Should Attend

- Instrumentation and Process Control Engineers
- Control Technicians
- Electrical and Automation Engineers
- Engineering management
- Energy Management Consultants

We particularly welcome you to bring along your own problems and data, and challenge the instructor to solve them.

We recommend that you attend our Introduction to Advanced courses in MATLAB prior to this course if you have not had any experience with MATLAB.

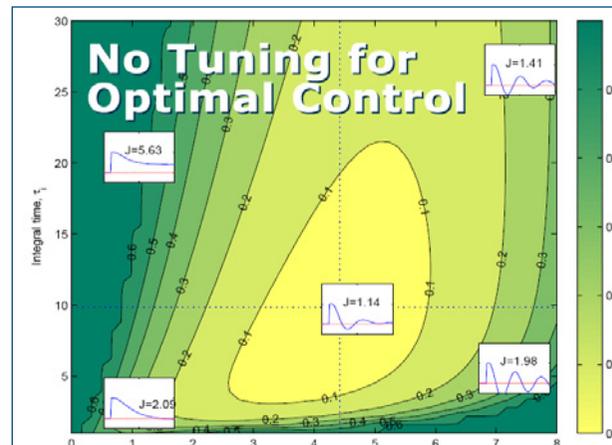
## Course Highlights

The first part of the course will cover:

- (1) Basics of feedback & control loops
- (2) Standard PID controllers and common industrial variations
- (3) PID tuning using only plant information
- (4) Going from model to suitable controller tuning
- (5) Using the controller design tools in MATLAB

We then move on to some more advanced options, difficult to control systems, and a selection of topics from advanced control.

- (1) Automatic tuning of PID controllers
- (2) Self-tuning regulators and adaptive systems
- (3) Handling difficult to control systems such as pH, deadtime
- (4) Optimal controllers such as Model Predictive Control



Optimising the design of your controls can help your company achieve greater efficiency to improve your company's bottom line.

## Benefits of using MATLAB

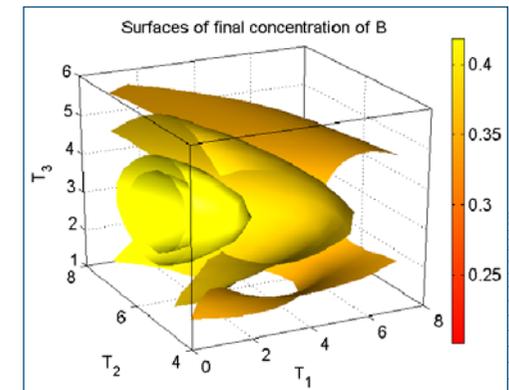
MATLAB is a software development environment that offers high-performance numerical computation, data analysis, visualisation capabilities and application development tools.

You can write statements in MATLAB and have them calculate immediately so they are tested as you go.

MATLAB provides immediate access to thousands of fundamental and speciality functions written by experts, in addition to those written by yourself or your colleagues.

MATLAB's built-in graphing tools and GUI builder ensure that you customise your data and models to help you interpret your data more easily for quicker decision-making.

Visit [www.hrs.co.nz/matlab](http://www.hrs.co.nz/matlab) for a more detailed description.



### On-site Training Option

We regularly train groups of people on-site in a wide variety of industries and locations spanning from government departments, financial institutions, engineering companies, and basic research groups. We make an effort to customise the courses to suit your problems and your interests.

Register online at [www.hrs.co.nz/controlmatlabtraining](http://www.hrs.co.nz/controlmatlabtraining)