

## Course Overview

Optimisation is a key task in almost all modern technology. Optimisation forms the basis of modelling and simulation, design of experiments and the associated statistical analysis of the data, and scheduling and manufacturing problems.

This course will show you how to employ a variety of optimisation strategies for engineering and scientific tasks. We will use the Optimization Toolbox to solve static problems in MATLAB, and we will use Simulink to solve dynamic optimisation problems.

In the course participants will experiment with a selection of real-world optimisation problems from disciplines as diverse as ecological models, fisheries management, optimal control strategies, statistical data fitting, travelling salesman, and optimal scheduling.

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

## Who should attend

This course is intended for those who want to look at applying optimisation techniques to modelling and simulation, design of experiments, associated statistical analysis of the data, and scheduling and manufacturing problems.

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

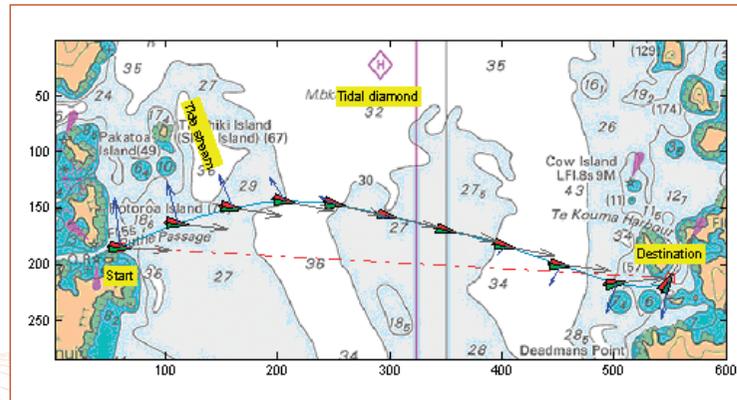
We recommend that you attend our introduction course before this course if you have not had any experience with MATLAB.

Register today to secure your spot on the course.

## Course Highlights

- Introduction to Optimisation problems, terminology and standard forms
  - Fitting smooth curves to noisy data
  - Dealing with outliers and errors
  - Introduction to the Optimization Toolbox for MATLAB and free alternatives
  - Unconstrained problems using classical and modern optimisation schemes
  - Constrained optimisation & multi-objective optimisation
  - Linear, nonlinear and integer programming problems and their unique characteristics
  - Dynamic optimisation problems using Simulink
- Course participants receive a full set of notes, overheads and a CD containing the course m-files and examples.

**Bottom:** Using MATLAB to optimise with the route for a kayak across the Firth of Thames battling the tides and wind.



## Benefits of using MATLAB

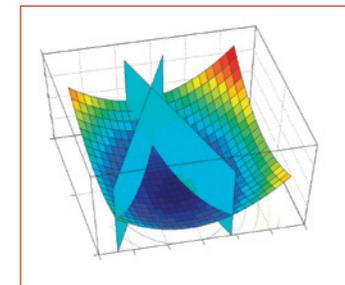
MATLAB is a software development environment that offers high-performance numerical computation, data analysis, visualisation capabilities and application development tools.

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.



**Above:** A constrained quadratic programming example.

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

### 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.