

- industry cross-fertilisation
- technology transfer
- industry forum
- seminars
- consultancy and case studies
- training

Introduction to Nonlinear Control (3-day Course) Agenda

Day 1

- 8.00 Introduction to nonlinear systems, problems that arise and types of nonlinearity
- 9.00 Methods of modelling nonlinear systems including physical equations, continuous and discrete time state-space models
- 9.45 Tea / Coffee
- 10.00 Linearization of nonlinear systems and stability analysis, including Lyapunov function theory
- 11.00 Hands-on session for modelling and analysis of nonlinear systems
- 11.45 Lunch
- 12.45 Nonlinear control problems based on the industrial practice
- 13.45 An introduction to classical approaches of nonlinear control design and analysis including describing function and phase plane methods
- 14.45 Tea / Coffee
- 15.00 Hands-on session for classical nonlinear control design methods
- 16.00 Close

Day 2

- 8.00 Restricted-structure controllers, multiple models and gain scheduling
- 9.00 *Hands-on session for RS and multiple model control*
- 9.45 Tea / Coffee
- 10.00 An introduction to Nonlinear Generalized Minimum Variance (NGMV) control design methods
- 11.00 NGMV Toolbox intro with examples demonstrating its capabilities
- 11.45 Lunch
- 12.45 *Hands-on session for NGMV control*
- 13.45 Advanced NGMV techniques (including Feedforward, Tracking, Factorized and Quadratic)
- 14.45 Tea / Coffee
- 15.00 *Hands-on session for advanced NGMV techniques*
- 16.00 Close

Day 3

- 8.00 Anti-windup techniques and time delay compensation methods
- 9.00 *Hands-on session for Anti-windup and delay compensation*
- 10.00 Tea / Coffee
- 10.15 Review of feedback linearization and extremum seeking control methods
- 11.00 *Hands-on session for feedback linearization and extremum seeking*
- 11.45 Lunch
- 12.45 Nonlinear control using EKF and Adaptive control
- 13.45 Review of predictive control for linear systems
- 14.15 Tea / Coffee
- 14.30 Predictive control design methods for nonlinear systems
- 15.30 *Hands-on session for predictive control*
- 16.15 Close