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→ industry cross-fertilisation   → seminars
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→ industry forum   → training

TRAINING COURSES

FROM THE

APPLIED CONTROL TECHNOLOGY CONSORTIUM

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Introduction

This brochure contains a list of the most comprehensive courses prepared and undertaken for members of the ACTC in the field of control engineering. All courses can be given as is or can focus on a particular requirement of the client company. This allows the material to be targeted at particular problem areas and use examples that have relevance to the trainees business.

Individual modules from different courses can be combined to form client-specific courses. In addition the modules themselves can be individually customised. Depending upon subject matter, courses can be aimed at technician to research engineer level. This ability is unique to the ACTC and has evolved through our long experience in the provision of training.

Should your company require course modules which are not listed here, the ACTC has the in-house capability to meet most needs. Our relationship with the University of Strathclyde can also be exploited to ensure that tuition on any control technique can be provided.

The ACTC also provides software tools for members use and companies can request basic introductory courses on these tools. Introductory courses to commercial simulation or design packages can also be provided.

Courses

Control Fundamentals 1: Theory (2 days)

The course provides training on an engineering level in Classical Control Theory and Control System Design. The course presents frequency and time domain analysis of linear control systems. The PID controller and tuning methods are also covered. Significant hands-on examples are used to reinforce the lectures. A follow on course, Control Fundamentals (Part 2: Application), extends this to looking at digital control, non-linearities and system identification.

Control Fundamentals II: Application (2 Days)

This is a follow-on course to, Control Fundamentals (Part 1: Theory), and covers additional, more practical topics, including digital control, non-linearities and system identification. Again, significant hands-on examples are used to reinforce the lectures.

Introduction to Process Control (1 Day)

This basic level course is aimed at technicians, operators and new graduates working in a process control environment. The course combines computer based learning, using the excellent IEE CD-ROM of the same name, together with some lecture based learning to reinforce the ideas through real-life examples.

Mathematics for Engineers and Control (3-day Course)

The course is suitable for engineers who wish to update or refresh their mathematical knowledge. Engineering literature often assumes prior knowledge of mathematical terms. By attending the above course, delegates will find such literature easier to understand. More generally, this course will provide delegates with mathematical skills required to solve complex engineering problems encountered in practice.

List of Recent Courses

5 December 2007: Introduction to Process Control, CATCH, Grimbsy

4-6 December 2007: LQ Optimal Control, Ford, Dearborn, USA

13-15 November: Optimisation and System Identification, University of Strathclyde

5-9 November 2007: "International Rolling Mill Academy - Advanced Control": University of Strathclyde

9-11 October 2007: Mathematics for Engineers and Control Fundamentals, Jaguar/Land Rover, Coventry

24-26 September: Intro to Modelling, Simulation & Control for Automotive Applications, Ricardo, Detroit, USA

19-21 September 2007: Introduction to Robust and Multivariable Control Design for Aerospace Applications, Boeing, Seattle, USA

18 September 2007: Introduction to Matlab/Simulink, Boeing, Seattle, USA

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5-7 Sept 2007: University of Strathclyde "Advances in Real-Time Control of Nonlinear Systems", Court Senate/Suite, Collins Building, University of Strathclyde

17-19 July 2007: Control Fundamentals – Practice and System Identification, Ford, Dearborn, USA

5 July 2007: Advances in Process and Condition Monitoring in the Offshore Oil Industry, The Linklater Rooms, University of Aberdeen

23-24 May 2007: ACTC Scheduled Training "Control Fundamentals 1 - Theory", University of Strathclyde, Glasgow

16 May 2007: ACTC Scheduled Training "Process Control for Process and Chemical Engineers", CATCH Training Facility, Stallingborough

22-23 March 2007: Control Fundamentals for Power Generation, RWE npower, UK

20-23 March 2007: Control Fundamentals and Introduction to Neural Networks, Chrysler, Auburn Hills, USA

19 March 2007: ACTC & National Instruments Automotive Control Workshop, Hilton Suites Auburn Hills, USA

6-8th Feb 2007: ACTC/Emerson Process Control Academy 2007, Stockport

5 – 7 December 2006: Introduction to Modeling, Simulation and Control for Aerospace Applications, BOEING, SEATTLE, USA

28-30 Nov 2006: Introduction to Nonlinear Control, Ford, Dearborn, USA

15 November 2006: Introduction to Kalman Filtering for SELEX-SA&S, University on Strathclyde

Control Design for Servomechanisms (3 or 4 Days)

This course has been specifically formulated for engineers who need a basic introduction to the control of servomechanisms. Illustrative examples and hands-on exercises (including a real-life servo system) are used extensively to reinforce the underlying control theory presented. The following topics are covered by the course: physical components, modelling and simulation of servo systems, classical control design, digital control, servo testing and system identification.

Predictive Control (1 Day)

Predictive control is probably the most popular advanced control technique adopted by the industry. Its popularity stems from capability for constraints handling and optimal control framework. The course provides overview of Predictive Control techniques and then gives guidelines for analysis and tuning of predictive controllers.

Overview of Modern Control Techniques (1 Day)

This mid-level training course is aimed at design engineers, new graduates and those interested in enhancing their understanding of advanced control. Some knowledge of classical control design techniques and mathematics is preferable, but not essential. The course aims to provide each delegate with a much clearer understanding of both the need for and some of the most popular approaches to advanced control.

Introduction to Estimation and Kalman Filtering (2 Day)

This course is aimed at introducing the Estimation theory, Kalman Filter and its application to engineers. The Kalman Filter and Extended Kalman Filter theory and practical applications are presented. Significant hands-on examples are used to reinforce the lectures.

Optimisation and System Identification (3 Day)

This three day training course introduces two closely related topics of Optimisation and System Identification. The Optimisation is extremely important subject used across all the Engineering fields. For control engineering applications it is widely used for optimal control and parameter identification/estimation. The system identification is probably the most important and difficult step required for a successful modern control design. Lectures and Hands-On sessions will provide a methodology and step-by-step guide of using all presented algorithms in their engineering practice.

Introduction to Robust and Multivariable Control Design (3 Day)

The basic concepts of robustness of control system and problems associated with the multivariable systems are introduced. Control techniques like Pole-Placement, Linear-Quadratic Optimal Control, H-infinity and predictive control are introduced. Available computer design packages are discussed and examples given during hands-on sessions.

Introduction to MATLAB/Simulink (1 Day)

This short training course introduces MATLAB/Simulink engineering packages and presents its application to control engineering problems.

Introduction to LabVIEW and Control Design/Simulation Toolkit (1 Day)

This short training course introduces LabVIEW and Control Design and Simulation Toolkit. The software tool capabilities are presented and its application to control engineering problems.

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1-2 November 2006: Scheduled Training: Control Fundamentals 1 – Theory, University of Strathclyde

27-28 Sept 2006: Advanced Control for Automotive Applications, Jaguar/Land Rover, Coventry, UK

13 September 2006: Introduction to Process Control Training Course, Lyondell, Stallingborough, UK

31 Aug 2006: Control 2006 UKACC Industry Session "Advances in Predictive Control being driven by Industry", Glasgow [Organised by ACTC]

13 July 2006: "Managing Alarms and Abnormal Situations in the Process Industries", CATCH,

30-31 May 2006: Introduction to Kalman Filtering, Ford, Dunton, UK

5-6 April 2006: ACTC/EPSRC International Workshop on Nonlinear Control Design for Industrial Applications, University of Strathclyde

6-10 March 2006: Alstom/ACTC "Rolling Mill Academy", Amsterdam, The Netherlands

20 Feb 2006: ACTC/NI Workshop "Advances in Real Time Control for Automotive Systems" , General Motors University, Auburn Hills Campus, Detroit, USA

27-29 Sept 2005: ACTC/Emerson "Process Control Academy 2005", Emerson, Leicester

19 May 2005: "Condition Monitoring and Safety Systems for Power and Process Plant" Energy, Oil and Gas SIG Meeting, RWE NPower Ferrybridge Workshop and Training Centre, Knottingley

Fundamentals of Dynamic Control using LabVIEW (3 Days)

This is the standard Control Fundamentals course but it uses LabVIEW Simulation and Control design during Hands-On sessions.

Introduction to Fuzzy Logic and Fuzzy Control (1 Day)

This course provides a simple introduction to the concept of Fuzzy Logic and how it can be used for control. An industrial application (paper making moisture control) is used in the hands-on to illustrate the concepts.

Neural Networks for Modelling, Control and Fault Detection (1 Day)

This course on Artificial Neural Networks covers topics ranging from simple introductory material (the course assumes no prior knowledge of the subject) to more advanced application material, looking at how neural networks can be applied for system modelling, estimation and fault detection. The lectures were complemented by computer based hands-on examples, utilising Matlab and its Neural Network toolbox. The course is also available as a 3- Day course.

Introduction to Nonlinear Control (3 Day)

This three-day course presents a variety of nonlinear control techniques, including nonlinear minimum variance, multiple model methods, nonlinear control using EKF and predictive control for nonlinear systems. These topics are introduced through lectures and application orientated (automotive) computer-based examples. The first day introduces the concept of a nonlinear system and how it is represented and classical approaches for coping with nonlinearities, making the course ideal for control engineers with no prior exposure to nonlinear control

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**If you require further details please complete the following form
and fax it to: +44 (0)141 553 1232**

Name:

Job Title:

Company:

Address:

Postcode:

Tel.:

Fax.:

E-mail:

Please contact me:

I am interested in the following training courses:

☐ Control Fundamentals I: Theory (2 Days)

☐ Control Fundamentals II: Application (2 Days)

☐ Introduction to Process Control (1 Day)

☐ Mathematics for Engineers and Control (3 Days)

☐ Control Design for Servomechanisms (3 or 4 Days)

☐ Predictive Control (1 Day)

☐ Overview of Modern Control Techniques (1 Day)

☐ Introduction to Estimation and Kalman Filtering (2 Day)

☐ Optimisation and System Identification (3 Day)

☐ Introduction to Robust and Multivariable Control Design (3 Day)

☐ Introduction to MATLAB/Simulink (1 Day)

☐ Introduction to LabVIEW and Control Design/Simulation Toolkit (1 Day)

☐ Fundamentals of Dynamic Control using LabVIEW (3 Days)

☐ Introduction to Fuzzy Logic and Fuzzy Control (1 Day)

☐ Neural Networks for Modelling, Control and Fault Detection (1 Day)

☐ Introduction to Nonlinear Control (3 Day)

Trainee Level (e.g. technician, graduate engineer, research engineer):

Trainee Area of Work:

☐ **I would like someone to contact me to discuss my training requirements.**

☐ **I would like to receive more information on other services that you provide.**

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