

Introduction to Process Control Agenda

09:00 INTRODUCTION

- Motivation - The Need for Control
- Fundamental Control Trade-offs and Challenges

9:30 PROCESS DYNAMICS

What are dynamics; Typical Responses

- Self-Regulating
- Integrating
- Nonlinearities
- Sensors / Actuators

10:45 *Tea/Coffee*

11:00 PROCESS DYNAMICS - Hands-on

Real-life Example of how dynamics are found

11:30 APPLYING PID CONTROL

- Proportional Control
- Integral Control Action
- Derivative Control Action

12:00 *Lunch*

12:45 APPLYING PID CONTROL (Cont.)

- Implementation / Structures of PID
- Integral Wind-up; Bumpless Transfer
- Tuning Methods: Ziegler-Nichols; IMC

13:30 PID Tuning - Hands-on

Real-life Example of Tuning a Level Controller

14:30 *Tea/Coffee*

14:45 ENHANCED CONTROL

Ratio control, Split Range Control, Coarse/Fine Control, Feed-forward Control, Cascade Control, Averaging Level Control, Dead-time Compensation, Linearising Control, Gain Scheduling, Decoupling Control

16:00 WHAT MAKES CONTROL DIFFICULT AND PRACTICAL SOLUTIONS

Deadtime and Lag Filtering Noise; Noise and Derivative Action
Disturbances Inappropriate Controller Tuning Nonlinearities; Sensor Saturation Example Actuator Problems - Hysteresis and Stiction

17:00 *Close*