

Process Control and Optimization

Summary

This course addresses the question of how we can keep pharmaceutical processes in optimal manufacturing conditions while ensuring versatility, resilience and quality of end product. Pharmaceutical control systems that are sustainable and balance the ecological footprint with ensuring access to high quality products and maintaining profitable supply chains. This question is part of the larger (international) challenge to ensure sustainable demand and production patterns, by improving environmental and societal sustainability and increasing the circularity in pharmaceutical production systems. This course is divided into two separate modules:

- 1) **Module 1: Identification: (1/2-day morning)**
- 2) **Module 2: PID-based process control (1/2-day afternoon)**

Target audience:

- people with no experience/expertise in the topic
- professional engineers faced with a control engineering problem who need to enhance their knowledge of the field
- managers who have control engineers working for them and who wish to better understand their job role
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- people that are looking for a refreshments on the identification and control principles

COURSE DESCRIPTION

The course includes a balance of:

This course will provide interactive learning and real-world application so you can directly apply what you're learning to your own context.

During the 1 day course the following concept will be addressed:

1. Process identification:
 - Fundamentals of process identification
 - Understanding process dynamics
 - Identification at operator level (e.g. first order plus dead time approximation model)
 - systems identification from relay experiments (PRBS identification)
2. Process control
 - PID based control for process optimization
 - Auto-tuning methods for PID design
 - Frequency response design for PID design (FRTool)

The session will end with an overview of advanced process control methodologies (e.g. model predictive control, event-based control, etc.) able to ensure plant-wide optimization.