NPTEL Video Course - Chemical Engineering - NOC:Chemical Process Control

Subject Co-ordinator - Prof. Sujit Jogwar

Co-ordinating Institute - IIT - Bombay

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Motivation for process control
Lecture 2 - Functions of process control system
Lecture 3 - Common control strategies
Lecture 4 - Components of process control system
Lecture 5 - Introduction to process dynamics
Lecture 6 - First principle dynamic models
Lecture 7 - Empirical and gray box models
Lecture 8 - Degree of freedom analysis
Lecture 9 - Introduction to first order dynamical systems
Lecture 10 - Linearization of process dynamics
Lecture 11 - Response to step input
Lecture 12 - Response to sinusoidal input
Lecture 13 - Introduction to second order dynamical systems
Lecture 14 - Examples of second order dynamical systems
Lecture 15 - Response to step input
Lecture 16 - Effect of damping coefficient
Lecture 17 - Higher order dynamics
Lecture 18 - Approximation as FOPDT model
Lecture 19 - Numerator dynamics
Lecture 20 - Prediction of step response
Lecture 21 - Block diagram representation
Lecture 22 - ON-OFF control
Lecture 23 - Proportional control
Lecture 24 - Proportional-Integral control
Lecture 25 - PID control
Lecture 26 - Limitations of PID controllers
Lecture 27 - Stability of dynamical processes
Lecture 28 - Laplace domain analysis - Part I
Lecture 29 - Laplace domain analysis - Part II

Lecture 30 - Frequency response
Lecture 31 - Frequency domain analysis
Lecture 32 - Synthesis problem
Lecture 33 - Selection problem
Lecture 34 - Criteria-based controller tuning
Lecture 35 - Heuristics-based controller tuning
Lecture 36 - Direct synthesis-based controller tuning
Lecture 37 - Frequency response-based controller tuning
Lecture 38 - Cascade control
Lecture 39 - Split range control and override control
Lecture 40 - Auctioneering, ratio and inreferential control
Lecture 41 - Openloop control and Internal model control
Lecture 42 - Dynamic Matrix and Model predictive control
Lecture 43 - Introduction to multivariable control
Lecture 44 - Input-output pairing
Lecture 45 - Tuning of multi-loop SISO controller
Lecture 46 - Introduction to batch process control
Lecture 47 - Programmable logic control
Lecture 48 - Batch to batch control