



CHEMICAL ENGINEERING

PROCESS CONTROL - DESIGN, ANALYSIS AND ASSESSMENT

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Department of Chemical Engineering
IIT Madras



TYPE OF COURSE : New | Core | UG

INTENDED AUDIENCE : BE, ME, MS

COURSE DURATION : 12 weeks (28 Jan 19-19 Apr 19)

EXAM DATE : 28 April 2019

INDUSTRIES APPLICABLE TO : ABB, Honeywell, GE, Reliance, Aditya Birla, FL Schmidt, DRL

COURSE OUTLINE :

The course will include as the first-third, material on transfer function, controller concepts, tuning and stability that are usually taught in a control class. The second-third of the course deals with MIMO control concepts at a basic level. The final-third of the course deals with performance assessment of SISO controllers.

ABOUT INSTRUCTOR :

Raghunathan Rengaswamy is a Professor at the Department of Chemical Engineering and a core member of the recently established Robert Bosch Center for Data Science and AI (RBC-DSAI) at IIT Madras. He is also a co-Founder and Director of Gyan Data Pvt. Ltd. (GDPL, identified as one of the top 10 start-ups to watch out for in 2018 by Analytics India Magazine), a high tech start-up in the area of data analytics located at IIT Madras Research Park. Recently, he co-founded GITAA Pvt. Ltd., a data science education company, incubated by the IITM Incubation Cell. Prior to this, he was Professor, Chemical Engineering and co-director of the Process Control and Optimization Consortium (PCOC) at Texas Tech University, Lubbock, TX USA, Associate and full Professor at Clarkson University, Potsdam, NY and Assistant Professor at IIT Bombay, Mumbai, India. He has also been a visiting professor at Purdue University, USA, University of Delaware, USA and University of Alberta, Canada. He has a B. Tech degree in Chemical Engineering from IIT Madras, India and a PhD in Chemical Engineering from Purdue University, West Lafayette, IN, USA.

COURSE PLAN :

Week 01 : Introduction

Week 02 : Models for Control

Week 03 : Analysis of Transfer Function Models

Week 04 : Controllers and Closed Loop Transfer Functions

Week 05 : Stability Analysis

Week 06 : Controller Tuning – Stability Based Methods

Week 07 : Controller Tuning – Direct Synthesis

Week 08 : Traditional Multivariable Control

Week 09 : Model Predictive Control Fundamentals

Week 10 : Model Predictive Control Implementation

Week 11 : Controller Performance Assessment and Diagnosis Fundamentals

Week 12 : Controller Performance Assessment and Diagnosis Implementation