



PROCESS CONTROL - DESIGN, ANALYSIS AND ASSESSMENT

PROF. RAGUNATHAN RENGASAMY

Department of Chemical Engineering
IIT Madras

TYPE OF COURSE : Rerun | Core | UG

COURSE DURATION : 12 weeks (24 Jan' 22 - 15 Apr' 22)

EXAM DATE : 24 Apr 2022

INTENDED AUDIENCE : Interested Learners

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 :

Prof. Raghunathan Rengaswamy is a Professor at the Department of Chemical Engineering, IIT Madras. Prior to this, he was a 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 was also a visiting professor at Purdue University, USA (2001), and spent summers as visiting researcher in other universities such as University of Delaware, USA and University of Alberta, Canada. He is also a Fellow of Indian Academy of Engineering (FNAE). Rengaswamy's major research interests are in the areas of Data Analytics, Fault Detection and Diagnosis (FDD), Sensor Placement (SP) algorithms for FDD. His work in the area of Data Science has been cited multiple thousands of times. One of his papers was chosen for a best paper award by the IFAC Journal, Engineering Applications of Artificial Intelligence for the years 2002 to 2005.

COURSE PLAN :

Week 1: Introduction

Week 2: Models for Control

Week 3: Analysis of Transfer Function Models

Week 4: Controllers and Closed Loop Transfer Functions

Week 5: Stability Analysis

Week 6: Controller Tuning - Stability Based Methods

Week 7: Controller Tuning - Direct Synthesis

Week 8: Traditional Multivariable Control

Week 9: 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