1.	Title of the course	Modern Process Control
2.	Course number	CH505L
3.	Structure of credits	3-0-0-3
4.	Offered to	PG
5.	New course/modification to	Modification To CH5025/16
6.	To be offered by	Department of Chemical Engineering
7.	To take effect from	July 2022
8.	Prerequisite	CoT
9.	**Course Objective(s):** To introduce the advanced control principles employed in process industries. To design and analyze the various advanced multivariable control strategies.	
10.	**Course Content:** Hierarchy of process control activities; Introduction to computer process control; Process identification: first-principles models, discretization of continuous-time models, discrete-time models; finite step response models, state-space models, transfer function to state space models; Linear time-invariant system: controllability, observability, stability; Design of multivariable controller: pole placement, linear quadratic regulator, state estimation, Kalman filter, linear quadratic Gaussian; Model predictive control; Advanced topics such as extension to control of nonlinear systems and introduction to reinforcement learning.	
11.	**Textbook(s):** 1. Astrom K J and Wittenmark B, *Computer-Controlled Systems: Theory and Design*, 3rd Edition, Dover Publications (2011). 2. Rawlings J B, Mayne D Q and Diehl M M, *Model Predictive Control: Theory, Computation and Design*, 3rd Edition, Nob Hill Publishing (2020).	
12.	**Reference(s):** 1. Chen C T, *Linear System Theory and Design*, 3rd Edition, Oxford University Press (1999). 2. Friedland B, *Control System Design: An Introduction to State-Space Methods*, 1st Edition, Dover Publications (2005). 3. Maciejowski J M, *Predictive Control with Constraints*, 1st Edition, Prentice Hall (2002).	