

1.	Title of the course	Process Dynamics and Control
2.	Course number	CH218L
3.	Structure of credits (L-T-P-C)	3-1-0-4
4.	New course/modification to	Modified with CH307L/PROCESS CONTROL AND INSTRUMENTATION
5.	To be offered by	Chemical Engineering
6.	Proposed by	M NABIL
7.	Prerequisite	None
8.	Course Objective(s): To develop dynamic models of process systems. To design closed loop control system and assess their stability.	
9.	Course Content: First principles model development; Process dynamics for first, second and higher order systems: linearization, transfer function, effect of poles, zeros and time delays on system response; Empirical models; Control system instrumentation: level, flow, temperature, pressure, valves and actuators; Piping and instrumentation diagrams (P&ID); Open and closed loop systems; Feedback control, concepts of proportional-integral-derivative (PID) controller; Stability analysis of closed loop systems: root locus, Bode and Nyquist plots; Tuning rules; Feed forward and cascade controller; Introduction to multivariable control.	
10.	Textbook(s): 1. Seborg D E, Edgar T F, Mellichamp D A and Doyle F J, Process Dynamics and Control, 4th Edition, Wiley India (2021). 2. Stephanopoulos G, Chemical Process Control: An Introduction to Theory and Practice, Pearson Education India (2015).	
11.	Reference(s): 1. Coughanowr D R and LeBlanc S E, Process Systems Analysis and Control, 3rd Edition, Tata McGraw Hill (2017). 2. Ogunnaike B and Ray W H, Process Dynamics, Modelling and Control, Oxford University Press (1994). 3. Bequette B W, Process Control: Modeling, Design and Simulation, 2nd Edition, Addison Wesley (2023). 4. Luyben W, Process Modeling, Simulation and Control, 2nd Edition, McGraw Hill Education (2013).	