

GUJARAT TECHNOLOGICAL UNIVERSITY
B.E. SEMESTER : V
CHEMICAL TECHNOLOGY

Subject Name: Process Instrumentation, Dynamics & Control

Subject Code: 153501

Teaching Scheme				Evaluation Scheme			
Theory	Tutorial	Practical	Total	University Exam(E)	University Exam(P)	Mid Sem Exam(Theory) (M)	Practical (Internal)
3	0	3	6	70	0	30	50

Sr. No.	Course contents
1.	Mechanism & working of instrumentation for temperature, pressure, level, & fluid flow rate measurements.
2.	Introduction to Industrial Process Control, Strategies for Control: Feedback/ Feedforward
3.	Forward Process & Reactor Dynamics, Solution to dynamic differential equations (linear & non-linear), Transfer functions & First/second order system dynamics/ features, Analysis of system dynamics through characteristic equation & stability of system & its analysis - Raouth's stability criteria & Bode plots.
4.	Controller algorithms: P, PI, PD, PID control actions. Closed loop responses with, P, PI, PID controllers. Selection of Controller & Control Criteria.
5.	Process Control Hardware: Controllers, measuring elements, Final control elements (valves selection), transducers.

Reference Books:

1. Process systems analysis and control, Donald Coughanowr and Lowell Koppel, Mc Graw Hill, 2005
2. Process Control : Modeling, Design and Simulation, Wayne Bequette, Prentice Hall, 2003
3. Process Dynamics and Control , Seaborg, Edger, Millichepp, John Wiley & Sons, 3rd Ed., 2010
4. Process Control : Theory and Applications, Corriou, Springer, 2004
5. Process Dynamics Process , Modeling and Control, Ogunnaike and H Ray, Oxford University, 1994
6. Essentials of Process Control, Luyben and Luyben, Mc Graw Hill, 1997
7. Plantwide Process Control, Ericson and Hedrick, Wiley, 1999
8. Chemical Process Control : An Introduction to Theory and Practice, G Stephanopoulos, Prentice Hall , 1994