GUJARAT TECHNOLOGICAL UNIVERSITY

B.E. SEMESTER : V

ENVIRONMENTAL SCIENCE & 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/ Feed forward
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, Millichemp, 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