GUJARAT TECHNOLOGICAL UNIVERSITY

INSTRUMENTATION AND CONTROL (APPLIED INSTRUMENTATION) (03)
PROCESS CONTROL AND OPTIMIZATION
SUBJECT CODE: 2740304
M.E. 4TH SEMESTER

Type of course: Major Elective-V

Prerequisite: Understanding of process control, process measurements and process instrumentation

Rationale:
This course provides an overview and fundamentals of various types of advance control strategies for boiler, Heat Exchanger and distillation Column control.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks						Total Marks
				Theory Marks		Practical Marks				
L	T	P	C	ESE (E)	PA (M)	ESE (V)		PA (I)		
						ESE	OEP	PA	RP	
3	2#	0	4	70	30	30	0	10	10	150

Content:

Sr. No.	Content	Total Hrs	% Weightage
1	Batch Control Description, Terminology, and Standard S88 Batch Processes and their Automation	**8**	**20%**
2	Boiler Control and Optimization	**8**	**20%**
3	Chemical Reactors: Batch Sequencing Chemical Reactors: Basic Control Strategies Chemical Reactors: Control and Optimization Chemical Reactors: Simulation and Modeling	**8**	**20%**
4	Distillation: Basic Controls Distillation: Calculations of Relative Gains Distillation: Optimization and Advanced Controls	**8**	**20%**
5	Heat Exchanger Control and Optimization	**8**	**20%**

Reference Books:

1. Process Control andOptimization, Volume – II, Béla G. Lipták, CRC Press Taylor & Francis

Course Outcome:
After learning the course the students should be able to

1. Understand control strategies for controlling distillation column.
2. Understand control strategies for controlling batch processes.
3. Understand control strategies for controlling Boiler.
4. Understand control strategies for controlling Heat Exchanger

List of Tutorials:
Student has to prepare various algorithms for developing control strategies techniques covered in this course with any computing tools (MatLab, Scilab, etc...).

Prepare research paper and submit report of various algorithms for developing control strategies techniques covered in this course.

Major Equipment:

Computer Laboratory

List of Open Source Software/learning website:

- Matlab, Scilab
- NPTEL

Review Presentation (RP): The concerned faculty member shall provide the list of peer reviewed Journals and Tier-I and Tier-II Conferences relating to the subject (or relating to the area of thesis for seminar) to the students in the beginning of the semester. The same list will be uploaded on GTU website during the first two weeks of the start of the semester. Every student or a group of students shall critically study 2 papers, integrate the details and make presentation in the last two weeks of the semester. The GTU marks entry portal will allow entry of marks only after uploading of the best 3 presentations. A unique id number will be generated only after uploading the presentations. Thereafter the entry of marks will be allowed. The best 3 presentations of each college will be uploaded on GTU website.