VEER SURNDRA SAI UNIVERSITY OF TECHNOLOGY, BURLA, ODISHA
LESSON PLAN

Semester: 2nd M.Tech. (Control and Instrumentation Engineering), Session: 2016-17
Subject: Process Control and Instrumentation, (Theory)
Branch: Electrical Engineering,   Name of Faculty: Dr. Gyan Ranjan Biswal

Period	Module No.	Topics to be Covered	Signature of Faculty
1	I	*Process dynamics:* Introduction to process control-objective of modelling-models of industrial process, Process control principles	
2	I	Classifications, order and types of process	
3	I	1st order and 2nd order systems	
4	I	Self regulating processes, dead time elements	
5	I	Common systems: fluid flow system,	
6	I	Heat transfer system	
7	I	Vibration control of machineries	
8	I	Chemical Reaction System: liquid level system without resistance elements, linearization of nonlinear terms, with nonlinear elements	
9	I	Non-interacting two-tank system with linear resistance elements, Interacting two-tank system with linear resistance elements	
10	I	Tubular Heat Exchanger, Discillation columns	
11	II	*Control actions and controller tuning:* classifications, controller terms	
12	II	Basic control actions-on/off, time proportional control	
13	II	Continuous Control: P, P+I	
14	II	P+D types, P+I+D	
15	II	Simplified and Robust Design of OPAMP based PID controller	
16	II	Digital Controller	
17	II	Design consideration of digital control	
18	II	Pneumatic Controller: pneumatic relays	
19	II	Pneumatic booster/ Bellows	
20	II	Design consideration of pneumatic control	
21	III	*Complex Control Techniques:* cascade control, Thumb rules, benefits	
22	III	Generalized Design procedure feedforwording controllers, lead-lag elements	
23	III	Practical aspect of designing feedforword control, Ratio control	

24	III	Adaptive control, Split range control	
25	III	MRAC, STR, Multivariable control	
26	III	*Programmable Logic Controllers:* Evolution of PLC	
27	III	Difference between PC based control and PLC	
28	III	Opto-isolation and Bumpless restart	
29	III	Sequential and Programmable controllers	
30	III	Architecture of PLC	
31	III	Programming of PLC: classifications	
32	III	Relay logic and Ladder logic, Functional blocks	
33	III	Programming of Digital Instructions, Logic using PLC	
34	III	Relat Diagram, Ladder Diagram, Algorithms and Programming	
35	III	Case Studies: Level Control of closed and open type Reserviors	
36	III	Case Studies:Elevators	
37	III	Case Studies: Refrigeration system	
38	III	Communication Networks for PLC	
39	IV	*Computer control of processes:* PLC based control of processes	
40	IV	Computer control of liquid level system: a case study	
41	IV	Computer control of heat exchangers	
42	IV	Smart sensors: classifications and design in brief	
43	IV	Networked Sensors	
44	IV	Field bus	
45	IV	Field bus	

Signature of Course Instructor   Signature of HOD (EE & EEE)