V R SIDDHARTHA ENGINEERING COLLEGE (Autonomous) :: Vijayawada-7
DEPARTMENT OF ELECTRONICS & INSTRUMENTATION ENGINEERING

Course code/Name: 17EI3601 Process Control　　　　　　　　　　**Dt: 25.11.2019**
Class: III Year (VI Semester), Section-A & B
Faculty Name: Mrs. A Sumalatha

Lesson Plan

S.No	Class No.	Topic Name	Delivery Method	Assessment Methods	Course Outcome Covered	K1	K2	K3	K4	K5	K6
						Cognitive levels of learning					
			UNIT-I								
1.	1	Introduction to Physical Processes and Modeling: Introduction to process control	Black-Board+PPT	-	-	-	-	-	-	-	-
2.	2	What is Automatic control, Definition, Process variables	Black-Board+PPT	Assignment Test Semester end exam	CO1	√					
3.	3	Process Degree of Freedom	Black-Board+PPT	Assignment Test Semester end exam	CO1		√				
4.	4	Characteristics of physical systems	Black-Board+PPT	Assignment Test Semester end exam	CO1		√				
5.	5	Elements of process control	Black-Board+PPT	Assignment Test Semester end exam	CO1		√				
6.	7	Mathematical modeling of liquid processes	Black-Board+PPT	Assignment Test Semester end exam	CO1				√		
7.	8	Mathematical modeling of gas processes ,Servo and regulatory operation	Black-Board+PPT	Assignment Test Semester end exam	CO1			√			

8.	10	Mathematical modeling of Thermal processes	Black-Board+PPT	Sessional Test Semester end exam	CO1			√				
9.	11	Process Identification - Step, frequency and pulse testing	Black-Board+PPT	Sessional Test Semester end exam	CO1			√				
10.	12	**Basic Controller Modes:** Basic control actions	Black-Board+PPT	Sessional Test Semester end exam	CO1		√					
11.	13	Characteristic of on-off control, Characteristic of proportional control	Black-Board+PPT	Sessional Test Semester end exam	CO1		√					
12.	14	Characteristic of single speed floating control, Characteristic of Integral control	Black-Board+PPT	Sessional Test Semester end exam	CO1		√					
13.	15	Characteristic of Proportional-Integral control ,Characteristic of Proportional-Derivative control	Black-Board+PPT	Sessional Test Semester end exam	CO1		√					
14.	16	Characteristic of Proportional-Integral-Derivative control, Comparison of PI, PD and PID control modes	Black-Board+PPT	Sessional Test Semester end exam	CO1		√					
UNIT-II												
15.	17	**Controlling Elements:** Self-operated controllers	Black-Board+PPT	Sessional Test Semester end exam	CO2		√					
16.	19	Pneumatic controllers- Pneumatic Proportional controllers(Displacement type)	Black-Board+PPT	Sessional Test Semester end exam	CO2		√					
17.	20	Hydraulic controllers- Hydraulic PI	Black-	Sessional Test	CO2		√					

		controller	Board+PPT	Semester end exam							
18.	21	Electrical controllers	Black-Board+PPT	Sessional Test Semester end exam	CO2		√				
19.	22	Electronic controllers	Black-Board+PPT	Sessional Test Semester end exam	CO2		√				
20.	23 .	**Actuators:** Pneumatic actuators, Pneumatic spring actuators, Pneumatic spring actuators with positioner	Black-Board+PPT	Sessional Test Semester end exam	CO2		√				
21.	24	Pneumatic spring less actuators, Electro-pneumatic actuators	Black-Board+PPT	Sessional Test Semester end exam	CO2		√				
22.	25	Hydraulic actuators –variable delivery pump, Electro hydraulic piston actuator	Black-Board+PPT	Sessional Test Semester end exam	CO2		√				
23.	26	Electric motor actuators-Relay type, Amplifier drive electric motor actuator	Black-Board+PPT	Sessional Test Semester end exam	CO2		√				
24.	27	**Control Valves:** Sliding stem control valves	Black-Board+PPT	Sessional Test Semester end exam	CO2		√				
25.	28	Rotating shaft control valves	Black-Board+PPT	Sessional Test Semester end exam	CO2		√				
26.	29	Control valve sizing	Black-Board+PPT	Sessional Test Semester end exam	CO2		√				
		UNIT-III									
27.	30	**Advanced Control Strategies:** Cascade control	Black-Board+PPT	Assignment Test Semester end exam	CO3				√		

S.No	L.No	Topic	Teaching Method	Assessment Method	CO						
28.	31	Analysis of cascade control	Black-Board+PPT	Assignment Test Semester end exam	CO3				√		
29.	32	Feed forward control	Black-Board+PPT	Assignment Test Semester end exam	CO3				√		
30.	33	Analysis of feedforward control,	Black-Board+PPT	Assignment Test Semester end exam	CO3				√		
31.	34	Implementing feedforward transfer functions, Tuning rules for feedforward control	Black-Board+PPT	Assignment Test Semester end exam	CO3				√		
32.	35	Ratio control	Black-Board+PPT	Assignment Test Semester end exam	CO3				√		
33.	36	Smith predictor control	Black-Board+PPT	Assignment Test Semester end exam	CO3				√		
34.	37	Internal model control , Internal model control structure	Black-Board+PPT	Sessional Test Semester end exam	CO3				√		
35.	38	Design of IMC controller	Black-Board+PPT	Sessional Test Semester end exam	CO3				√		
36.	39	Split range control	Black-Board+PPT	Sessional Test Semester end exam	CO3				√		
37.	40	Controller Tuning: Criteria for good control , Tuning methods - Ziegler-Nichols method of tuning	Black-Board+PPT	Sessional Test Semester end exam	CO3	√					
38.	41	Cohen-Coon method of tuning	Black-Board+PPT	Sessional Test Semester end exam	CO3	√					
UNIT-IV											
39.	43	Applications: pH control , Defining the pH curve , Rangeability requirements for pH control systems	Black-Board+PPT	Sessional Test Semester end exam	CO4			√			
40.	44	Feedforward control of pH	Black-Board+PPT	Sessional Test Semester end exam	CO4			√			

41.	45	Mass transfer operations- mathematical modeling and control of Distillation column	Black-Board+PPT	Sessional Test Semester end exam	CO4			√				
42.	46	Modeling of the Distillation process	Black-Board+PPT	Sessional Test Semester end exam	CO4				√			
43.	47	Evaporation, Multiple effect evaporation	Black-Board+PPT	Sessional Test Semester end exam	CO4				√			
44.	48	Material – balance control	Black-Board÷PPT	Sessional Test Semester end exam	CO4				√			
45.	49	Vapour compression evaporator, Barometric condensers	Black-Board÷PPT	Sessional Test Semester end exam	CO4				√			
46.	51	Drying, The rate of drying	Black-Board÷PPT	Sessional Test Semester end exam	CO4				√			

Course Coordinator

Module Coordinator

P Srinivas
Program Coordinator

G-N-C
Head of the Department

V R SIDDHARTHA ENGINEERING COLLEGE (Autonomous) :: Vijayawada-7
DEPARTMENT OF ELECTRONICS & INSTRUMENTATION ENGINEERING

Course code/Name: 17EI3602 Computer Control of Processes
Class: III Year (VI Semester)
Faculty Name: Mr. P Srinivas, Assoc. Professor

Dt: 25.11.2019

Lesson Plan/ Course Handout

S. No	Class No.	Topic Name	Delivery Method	Assessment Methods	Course Outcome Covered	K1	K2	K3	K4	K5	K6
		UNIT-I									
1	1	Syllabus & COs, Overview	Black- Board	-	-						
2	2	Introduction to computer control system, Merits & De-Merits	PPT	Home Assignment Semester end exam	CO1	√					
3	3	Block diagram of computer control system	Black- Board	Assignment Test Semester end exam	CO1			√			
4	4	Data logging system and its operation	Black- Board	Assignment Test Semester end exam	CO1			√			
5	5	Supervisory control and its operation with example	Black- Board	Home Assignment Semester end exam	CO1				√		
6	6	DDC operation with example	Black- Board	Home Assignment Semester end exam	CO1				√		
7	7	Problems on computer control processes	NPTEL	Home Assignment Semester end exam	CO1					√	
8	8	Introduction to Mathematical modeling, Modeling of	Black- Board	Semester end exam	CO2	√					

		instantaneous process											
9	9	Modeling of First order process without and with pure delay in discrete domain	Black- Board	Assignment Test Semester end exam	CO2								✓
10	11	Modeling of second order process without and pure delay in discrete time domain	Black- Board	Home Assignment Semester end exam	CO2								✓
11	13	Modeling of higher order process in discrete time domain	Black- Board	Home Assignment Semester end exam	CO2								✓
12	14	Pulse transfer function – Definition, Procedure to develop pulse transfer function	Black- Board	Sessional Test Semester end exam	CO2	✓							
UNIT-II													
13	15	Mathematical representation of sampler and hold device	PPT	Sessional Test Semester end exam	CO3							✓	✓
14	16	Transfer function of ZOH	Black- Board	Sessional Test Semester end exam	CO3								✓
15	17	Modified Z-transforms, Evaluation of modified Z-transforms for standard inputs	Black- Board	Home Assignment Semester end exam	CO3							✓	
16	19	Open loop response of sample data system, Problems	Black- Board	Sessional Test Semester end exam	CO3							✓	
17	21	Closed loop response of computer control system, problems	Black- Board	Home Assignment Semester end exam	CO3							✓	
18	24	Stability in Z-domain	Black- Board	Home Assignment Semester end exam	CO3			✓					
19	25	Jury stability criterion, Problems	Black- Board	Home Assignment Semester end exam	CO3							✓	
UNIT-III													
20	27	Introduction to digital control algorithm, Dead-beat algorithm	PPT	Assignment Test Semester end exam	CO4	✓							
21	28	Problems on dead-beat algorithm	Black- Board	Home Assignment	CO4								✓

No	L.No	Topic	Teaching Aid	Assessment Method	CO							
22	30	Dahlin's algorithm	Black- Board	Semester end exam / Home Assignment	CO4							
23	31	Problems on Dahlin's algorithm	Black- Board	Semester end exam / Home Assignment	CO4							√
24	33	Kalman's algorithm	Black- Board	Semester end exam / Home Assignment	CO4							√
25	34	Problems on Kalman's algorithm	Black- Board	Semester end exam / Assignment Test	CO4							√
26	36	PID algorithm – Position form	Black- Board	Semester end exam / Home Assignment	CO4							√
27	37	Velocity PID algorithm	Black- Board	Semester end exam / Home Assignment	CO4				√			
28	38	Design of digital PID algorithm	Black- Board	Semester end exam / Home Assignment	CO4				√			
29	39	Design of digital control algorithm for load changes and problems	Black- Board	Semester end exam / Home Assignment	CO4							√
30	40	Selection of sampling time	PPT	Semester end exam / Home Assignment	CO4							√
					CO4		√					
UNIT-IV												
31	41	Introduction to intelligent control system	PPT	Sessional Test / Semester end exam	CO5	√						
32	42	Introduction ACS, block diagram of MRAS	Black- Board	Sessional Test / Semester end exam	CO5		√					
33	43	Block diagram of MIAS	Black- Board	Home Assignment / Semester end exam	CO5					√		
34	44	AI based system, structure of Expert system	Black- Board	Sessional Test / Semester end exam	CO5				√			
35	45	Expert control system	NPTEL	Sessional Test / Semester end exam	CO5		√					
36	46	Introduction to Fuzzy control	PPT	Sessional Test / Semester end exam	CO5	√						

37	47	Block diagram of Fuzzy control system	NPTEL	Sessional Test Semester end exam	CO5				√		
38	49	Introduction to ANN, classification of ANN	Black- Board	Sessional Test Semester end exam	CO5	√					
39	51	Neuro and Neuro Fuzzy control systems	Black- Board	Sessional Test Semester end exam	CO5			√			

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V R SIDDHARTHA ENGINEERING COLLEGE (Autonomous) :: Vijayawada-7
DEPARTMENT OF ELECTRONICS & INSTRUMENTATION ENGINEERING

Course code/Name: 17EI4603/C – Robotics and Control   **Dt: 25.11.2019**
Class: III Year (VI Semester), Section-A & B
Faculty Name: Mr. P.Durgaprasadarao

Lesson Plan/ Course Handout

S. No	Class No.	Topic Name	Delivery Method	Assessment Methods	Course Outcome Covered	K1	K2	K3	K4	K5	K6
						Cognitive levels of learning					
		UNIT-I									
1	1	Syllabus & COs, Overview	PPT	-	-						
2	2	Evolution of Robots and Robotics: Introduction,Master-Slave Manipulator, Mobile robot,Progressive and advancements in Robots.	PPT	Semester end exam	CO1	√					
3	3	Laws of robotics: Three laws of Robotics	PPT	Assignment Test Semester end exam	CO1	√					
4	4	Robot anatomy: Introduction to robotics anatomy	Black Board	Assignment Test Semester end exam	CO1		√				
5	5	Manipulators: -Mechanical structure of manipulator -Brief description of planar manipulators and spatial manipulators	PPT/Video	Assignment Test Semester end exam	CO1	√					
6	6	Links: Binary link, Open Kinematic link	PPT/Video	Assignment Test Semester end exam	CO1	√					
7	7	Types of joints: Revolute (R), Prismatic, Rotary and Twist joints	PPT/Video	Assignment Test Semester end exam	CO1		√				

						C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
8	8	Degrees of freedom: Definition and Examples	PPT	Semester end exam	CO1	√									
9	9	Required DOF in a manipulator: Spatial, Planar and redundant Manipulators	PPT	Assignment Test Semester end exam	CO1	√									
10	10	ARM and Wrist configuration: ARM Configurations:-Cartesian, Cylindrical, Polar and Articulated configurations. Wrist Configurations: -Roll-Pitch-Yaw or RPY Wrist	PPT/Video	Home Assignment Sessional Test Semester end exam	CO1	√									
11	11	End effectors: -Two fingered Endeffectors or gripper -Electromagnetic End effectors -Vacuum End-effectors	PPT	Home Assignment Semester end exam	CO1		√								
12	12	Robot actuators: Brief Description of Hydraulic, Pneumatic and electric actuators.	PPT/Video	Sessional Test Semester end exam	CO1								√		
13	13	Sensors and vision: Sensors in Manipulator control system	PPT	Semester end exam	CO1		√								
		UNIT-II													
14	14	Co-ordinate frames- Mapping, mapping between rotated frames	PPT	Sessional Test Semester end exam	CO2	√									
15	15	Mapping between translated frames and Mapping between rotated and translated frames	PPT	Sessional Test Semester end exam	CO2		√	√							
16	16	Transformation of vectors-Rotation of vectors, translational vectors, combined rotational and translational vectors, composite transformation.	PPT	Sessional Test Semester end exam	CO2	√	√	√							
17	17	Homogeneous transformation matrices-Inverting Homogeneous matrices	PPT	Sessional Test Semester end exam	CO2	√	√								

		Topic	Delivery	Assessment	CO	P1	P2	P3	P4	P5	P6	P7
18	18	Fundamentals of rotation matrices	PPT	Sessional Test Semester end exam	CO2	√						
19	19	Direct kinematic model: Introduction to Direct kinematic model	PPT	Sessional Test Semester end exam	CO2	√						
20	20	Mechanical structure and notations: Numbering of links and joints with example	PPT	Sessional Test Semester end exam	CO2	√						
21	21	Description of links and joints	PPT/Video	Semester end exam	CO2		√					
22	22	Kinematic modeling of the manipulator: Direct and Inverse kinematic modeling-Block diagram and explanation	PPT	Sessional Test Semester end exam	CO2		√					
23	23	Denavit Hartenberg (DH) notation: DH convention for assigning frames to links and identifying joint link parameters.	PPT	Home Assignment Semester end exam	CO2	√					√	
24	24	Kinematic relationship between adjacent links: Geometric relation between adjacent links.	PPT	Semester end exam	CO2		√					
25	25	Manipulator transformation matrix: Location of end-effector frame relative to base frame.	PPT	Semester end exam	CO2				√			
26	26	Case study- 3DOF articulated arm kinematic model: A 3-DOF articulated arm with three revolute joints-Frame assignment and kinematic model formulation.	PPT	Sessional Test Semester end exam	CO2							√
27	27	Inverse kinematics: Introduction to inverse kinematics, configuration of endeffector as a function of joint displacements.	PPT	Sessional Test Semester end exam	CO2	√						

No	No	Topic	Method	Evaluation	CO								
28	28	Manipulator work space.	PPT	Semester end exam	CO2			√					
29	29	Solvability of inverse kinematic model: Existence of solutions and multiple solutions	PPT	Sessional Test Semester end exam	CO2		√						√
30	30	Solution Techniques: Numerical solutions, closed form solution: Guidelines to obtain closed form solutions	PPT	Sessional Test Semester end exam	CO2					√			
31	31	Case study – 3DOF articulated arm inverse kinematics: Determination of joint displacements for known and orientation of the end of the arm point.	PPT	Sessional Test Semester end exam	CO2								√
		UNIT-III											
32	32	Block diagram of manipulator control system.	PPT	Assignment Test Semester end exam	CO3	√				√			
33	33	Open and closed loop control system, Manipulator control problem.	Black- Board	Semester end exam	CO3		√						
34	34	Linear control schemes.	Black- Board	Assignment Test Semester end exam	CO3	√							
35	35	Second order SISO model of a manipulator joint.	Black- Board	Assignment Test Semester end exam	CO3								√
36	36	Model of a DC motor, Partition PD and PID control schemes.	Black- Board	Assignment Test Semester end exam	CO3								√
37	37	Force control of robotic manipulator.	Black- Board	Assignment Test Semester end exam	CO3	√							√
38	38	Hybrid position/ force control, impedance control	Black- Board	Assignment Test Sessional Test Semester end exam	CO3	√	√						

			UNIT-IV										

No	No	Topic	Mode	Assessment	CO								
39	39	Industrial applications: Four characteristic industrial applications of Robot	PPT/Video	Sessional Test Semester end exam	CO4	√							
40	40	Material handling: Types of material handling operations	PPT	Sessional Test Semester end exam	CO4						√		
41	41	Material transfer applications: Typical pick and place work cycle.	PPT/Video	Home Assignment Semester end exam	CO4		√	√					
42	42	Machine loading and unloading application: A robot centered workcell for Machine loading/unloading application.	PPT/Video	Home Assignment Semester end exam	CO4						√		
43	43	Picking and placing : Pick and place operation on conveyors.	PPT/Black Board	Home Assignment Semester end exam	CO4	√							
44	44	Palletizing and depalletizing: Palletizing and depalletizing operations –Example.	PPT/Video	Sessional Test Semester end exam	CO4					√			
45	45	Processing applications-Welding: Arc Welding. Arc welding robot requirements.	PPT/Video	Sessional Test Semester end exam	CO4				√		√		
46	46	Assembly applications: Introduction to assembly applications.	PPT	Sessional Test Semester end exam	CO4	√					√		
47	47	Peg in hole assembly.	PPT/Video	Sessional Test Semester end exam	CO4	√							
48	48	Inspection application: Robots in inspection-Sensor based inspection, Vision based inspection, Testing.	PPT	Sessional Test Semester end exam	CO4		√		√				
49	49	An overview of non industrial applications: Robotic technology in non-industrial environment.	PPT/Video	Sessional Test Semester end exam	CO4	√							

50	50	Work place design considerations for safety: Safety rules and safety devices in robotics.	PPT//Video	Semester end exam	CO4		✓						
51	51	Safety sensors and safety monitoring in robotic work cell.	PPT/Video	Semester end exam	CO4		✓						

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Course Coordinator

Sumalatta A.
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V R SIDDHARTHA ENGINEERING COLLEGE (Autonomous)
Vijayawada-520 007
DEPARTMENT OF ELECTRONICS & INSTRUMENTATION ENGINEERING

Course code/Name: 17EI4603/D Industrial Communication Networks

Date: 07.01.2020

Class: III Year (VI Semester)

Faculty Name: Swathi Nadipineni

Lesson Plan/ Course Handout

S.No	Class No.	Topic Name	Delivery Method	Assessment Methods	Course Outcome Covered	K1	K2	K3	K4	K5	K6
						Cognitive levels of learning					
1.	1.	Syllabus & COs. Overview	Black Board	-	-	-	-	-	-	-	-
UNIT I											
2.	2.	Introduction to Data Communication and Industrial Networks: Introduction, Data communication - Simplified data communication model	Black Board	Assignment Test Semester end exam	CO1	√					
3.	3.	Main characteristics, Data types, Data flow methods - Simplex, Half-duplex, Full duplex, Full/Full duplex	Black Board	Assignment Test Semester end exam	CO1		√				
4.	4.	Transmission modes - Parallel, Serial, Asynchronous, Synchronous, Isochronous	Black Board	Assignment Test Semester end exam	CO1		√				
5.	5.	Transmission impairments, Data rate and bandwidth relationship	Black Board	Home Assignment Semester end exam	CO1			√			
6.	6.	Introduction to networks - Network characteristics, Connection types	Black Board & PPT	Home Assignment Semester end exam	CO1	√					
7.	7.	Data communication standards and organizations - Brief description of different standard organizations in data and networking	Black Board & PPT	Home Assignment Semester end exam	CO1	√					

8.	8.	Network topology - Mesh, Star, Bus, Ring, Hybrid	Black Board & PPT	Assignment Test Semester end exam	CO1						√
9.	9.	Network components - Brief description of servers, transmission media, clients and shared printers	Black Board & PPT	Home Assignment Semester end exam	CO1	√					
10.	10.	Classification of networks - LANs, MANs, WANs, GANs	Black Board & PPT	Assignment Test Semester end exam	CO1					√	
11.	11.	OSI model - Block diagram and functioning of each layer	Black Board & PPT	Assignment Test Semester end exam	CO1				√		
12.	12.	TCP/IP reference model - Protocol architecture	Black Board & PPT	Sessional Test Semester end exam	CO1				√		
13.	13.	Operation, PDUs in architecture	Black Board & PPT	Home Assignment Semester end exam	CO1		√				

<div align="center">UNIT II</div>

14.	14.	**Networks in Process Automation:** Introduction - Communication hierarchy in factory automation	Black Board & PPT	Sessional Test Semester end exam	CO2					√	
15.	15.	I/O bus networks - Types	Black Board & PPT	Sessional Test Semester end exam	CO2		√				
16.	16.	Network and protocol standards, Networking at I/O & field levels	Black Board & PPT	Home Assignment Semester end exam	CO2			√			
17.	17.	Networking at Control level, Enterprise/Management level - Brief description	Black Board & PPT	Home Assignment Semester end exam	CO2			√			
18.	18.	**Highway Addressable Remote Transducer (HART):** Introduction to HART protocol	Black Board	Home Assignment Semester end exam	CO2	√					
19.	19.	Features and benefits of HART Protocol	Black Board & PPT	Home Assignment Semester end exam	CO2		√				
20.	20.	HART encoding and waveform - Brief description of Frequency Shift Keying (FSK) technique	Black Board & PPT	Sessional Test Semester end exam	CO2		√				
21.	21.	HART character, HART addressing - Short and long Address, Arbitration	Black Board & PPT	Home Assignment Semester end exam	CO2		√				
22.	22.	Communication modes - Master, Slave, Burst modes, HART networks - Point-to-point, Multi drop configurations	Black Board & PPT	Sessional Test Semester end exam	CO2				√		

No.	No.	Topic	Teaching Method	Assessment	CO					
23.	23.	HART communication layers - Physical	Black Board & PPT	Sessional Test Semester end exam	CO2				√	
24.	24.	Data link, Application Layer	Black Board & PPT	Sessional Test Semester end exam	CO2				√	
UNIT III										
25.	25.	**Foundation Field Bus:** Introduction, Definition and features, Foundation field bus data types	Black Board	Semester end exam	CO3	√				
26.	26.	Architecture - Two-level Foundation Fieldbus architecture, H1 benefits, HSE benefits	Black Board & PPT	Assignment Test Semester end exam	CO3		√			
27.	27.	OSI model of foundation fieldbus: Physical layer	Black Board & PPT	Assignment Test Semester end exam	CO3				√	
28.	28.	Data link layer	Black Board & PPT	Assignment Test Semester end exam	CO3				√	
29.	29.	Application layer	Black Board & PPT	Assignment Test Semester end exam	CO3				√	
30.	30.	Technology in foundation Fieldbus - User application blocks, Resource block	Black Board & PPT	Home Assignment Semester end exam	CO3		√			
31.	31.	Function block	Black Board & PPT	Home Assignment Semester end exam	CO3		√			
32.	32.	Transducer block	Black Board & PPT	Home Assignment Semester end exam	CO3		√			
33.	33.	Device information - Device description, Device description language, DD Tokenizer, DD services	Black Board & PPT	Semester end exam	CO3		√			
34.	34.	DD hierarchy, capabilities file, Device identification	Black Board & PPT	Semester end exam	CO3				√	
35.	35.	Redundancy - Host level, Sensor, Transmitter	Black Board & PPT	Sessional Test Semester end exam	CO3		√			
UNIT IV										
36.	36.	**PROFIBUS:** Introduction, Transmission technology	Black Board & PPT	Semester end exam	CO4	√				
37.	37.	Communication protocols	Black Board & PPT	Semester end exam	CO4		√			

No.	No.	Topic	Teaching Method	Assessment Method	CO					
38.	38.	Device classes, PROFIBUS in automation, OSI model of PROFIBUS protocol stack	Black Board & PPT	Home Assignment Semester end exam	CO4				√	
39.	39.	PROFIBUS - DP characteristics - Version DP – V0	Black Board & PPT	Sessional Test Semester end exam	CO4				√	
40.	40.	Version DP – V1	Black Board & PPT	Sessional Test Semester end exam	CO4				√	
41.	41.	Communication profile of PROFIBUS – DP	Black Board & PPT	Sessional Test Semester end exam	CO4				√	
42.	42.	Physical layer, Data link layer	Black Board & PPT	Sessional Test Semester end exam	CO4					√
43.	43.	DDLM and user interface. PROFIBUS - PA characteristics	Black Board & PPT	Sessional Test Semester end exam	CO4		√			
44.	44.	Bus access method, Data telegram device profile	Black Board & PPT	Sessional Test Semester end exam	CO4		√			
45.	45.	PA Block model	Black Board & PPT	Sessional Test Semester end exam	CO4			√		
46.	46.	Bus monitor, Time stamp, Redundancy	Black Board & PPT	Home Assignment Semester end exam	CO4		√			
47.	47.	PROFIsafe, PROFIdrive	Black Board & PPT	Home Assignment Semester end exam	CO4				√	
48.	48.	PROFInet, Foundation Fieldbus and PROFIBUS a comparison	Black Board & PPT	Sessional Test Semester end exam	CO4					√

N. Sirothi 7/1/2020	V. Noephonthily	P Seinivas	C.N.S
Course Coordinator	**Module Coordinator**	**Program Coordinator**	**Head of the Department**

V R SIDDHARTHA ENGINEERING COLLEGE (Autonomous) :: Vijayawada-7
DEPARTMENT OF ELECTRONICS & INSTRUMENTATION ENGINEERING

Course code/Name: 17EI4604B Industrial Electronics

Dt: 02.12.2019

Class: III Year (VI Semester), Section-A & B

Faculty Name: Mr. P Rajesh

Lesson Plan/ Course Handout

S. No	Class No.	Topic Name	Delivery Method	Assessment Methods	Course Outcome Covered	Cognitive levels of learning					
						K1	K2	K3	K4	K5	K6
1	1	Syllabus & COs, Overview	Green Glass Board	-	-						
2	2	Need and Scope of Industrial Electronics in Industries	Green Glass Board	Home Assignment Semester end exam	CO1	√					
3	3	Basic construction of SCR ,Symbol and schematic structure of SCR	Green Glass Board	Assignment Test Semester end exam	CO1		√				
4	4	Operation and characteristics of SCR	Green Glass Board	Assignment Test Semester end exam	CO1		√				
5	5	Switching characteristics during turn on of SCR	Green Glass Board	Home Assignment Semester end exam	CO1				√		
6	6	Switching characteristics during turn off of SCR	Green Glass Board	Assignment Test Semester end exam	CO1						√
7	11	Gate characteristics	Green Glass Board	Assignment Test Semester end exam	CO1			√			

8	12	SCR turn on methods	Green Glass Board	Assignment Test Semester end exam	CO1		√				
9	13	SCR commutation techniques	Green Glass Board	Assignment Test Semester end exam	CO1		√				
10	14	Asymmetrical SCR-operation and V-I characteristics	Green Glass Board	Assignment Test Semester end exam	CO1		√				
11	15	RCT-operation and V-I characteristics	Green Glass Board	Assignment Test Semester end exam	CO1		√				
12	16	GATT-operation and V-I characteristics	Green Glass Board	Assignment Test Semester end exam	CO1		√				
13	17	DIAC-operation and V-I characteristics	Green Glass Board	Assignment Test Semester end exam	CO1		√				
14	18	TRIAC-operation and V-I characteristics	Green Glass Board	Assignment Test Semester end exam	CO1		√				
15	20	Thyristor Converters-Introduction and operation	Green Glass Board	Sessional Test Semester end exam	CO2					√	√
16	21	Single phase Half wave converters with RL and free wheeling diode	Green Glass Board	Sessional Test Semester end exam	CO2			√			

		Topic	Teaching Aid	Assessment	CO						
17	25	Single phase Full wave converters with RL and free wheeling diode	Green Glass Board	Sessional Test Semester end exam	CO_2			√			
18	26	Single phase bridge wave converters with RL and free wheeling diode	Green Glass Board	Sessional Test Semester end exam	CO_2					√	
19	28	Single phase inverters- using centre tapped DC supply, Centre tapped load and parallel capacitor commutation	Green Glass Board	Home Assignment Semester end exam	CO_2					√	
20	29	Mc Murray Inverter :V-I characteristics and circuit diagram	Green Glass Board	Home Assignment Semester end exam	CO_2		√				
21	30	Mc Murray Bedford Inverter: V-I characteristics and circuit diagram	Green Glass Board	Home Assignment Semester end exam	CO_2			√			
22	31	Principle of step-down chopper – operation and analysis Principle of step-up chopper- operation and analysis	Green Glass Board	Home Assignment Semester end exam	CO_2			√			
23	32	Chopper configurations		Home Assignment Semester end exam	CO_2			√			
24	33	DC Amplifier- introduction and basic circuit	Green Glass Board	Assignment Test Semester end exam	CO_3	√		√			
25	34	Differential amplifier as a DC amplifier,	Green Glass Board	Assignment Test Semester end exam	CO_3						√
26	35	Chopper stabilized DC amplifier-	Green Glass	Assignment Test Semester end exam	CO_3		√				

		ring bridge modulator, single transistor and two transistor chopper	Board									
27	36	Regulated power supplies: Principle, block diagram and operation, DC voltage regulator	Green Glass Board	Home Assignment Semester end exam	CO3		√					
28	37	Uninterrupted power supply (UPS)- transfer type and continuous type ups	Green Glass Board	Assignment Test Semester end exam	CO3				√			
29	38	Switched mode power supplies (SMPS) – block diagram and operation	Green Glass Board	Assignment Test Semester end exam	CO3				√			
40	40	Industrial timing circuits- classification of timers , thermal timer ,electronic timer and RC timer	Green Glass Board	Sessional Test Semester end exam	CO4	√						
41	42	Electric welding methods and types-	Green Glass Board	Sessional Test Semester end exam	CO4		√					
42	43	Induction and Dielectric Heating: Principle, Theory and applications	Green Glass Board	Sessional Test Semester end exam	CO4				√			
43	44	Amplidyne servo mechanism- Amplication improvement method	Green Glass Board	Home Assignment Semester end exam	CO4	√						

44	45	Ultrasonic generators and applications-electrode directly across the coil	Green Glass Board	Sessional Test Semester end exam	CO4	√		√			
45	46	Speed Control of Induction motor – chopper controlled wound-rotor induction motor	Green Glass Board	Sessional Test Semester end exam	CO4			√			
46	48	Supersynchronous motor drives-dc link ,Cyclo converter cascade	Green Glass Board	Home Assignment Semester end exam	CO4		√				

Course Coordinator   **Module Coordinator**   **Program Coordinator**   **Head of the Department**

V R SIDDHARTHA ENGINEERING COLLEGE (Autonomous) :: Vijayawada-7
DEPARTMENT OF ELECTRONICS & INSTRUMENTATION ENGINEERING

Course code/Name: 17EI4604/C Process Modeling and Simulation
Class: III Year (VI Semester), Section-A & B
Faculty Name: Mrs. K.Vijaya Lakshmi

Dt: 25.11.2019

Lesson Plan/ Course Handout

K1-Remember;K2-Understand; K3-Apply; K4-Analyze; K5-Evaluate; K6-Create

S. No	Class No.	Topic Name	Delivery Method	Assessment Methods	Course Outcome Covered	K1	K2	K3	K4	K5	K6
					UNIT-I						
1	1	Syllabus, COs, Definitions of process model and simulation	PPT	-	-						
2	2	Model representation-Example of Liquid Tank	Black- Board	Assignment Test Semester end exam	CO1		√				
3	3	Types of modeling equations, Classification of Mathematical Models	Black- Board	Assignment Test Semester end exam	CO1				√		
4	4	Process models and Dynamic behaviour - Example of Liquid Surge Vessel Model, Reasons for Modelling	Black- Board	Assignment Test Semester end exam	CO1		√				
5	5	Model development using material balances - Example of gas surge drum	Black- Board	Assignment Test Semester end exam	CO1						
6	6	Model development using material balances - isothermal chemical reactor	Black- Board	Assignment Test Semester end exam	CO1						√
7	7	Model development using material and energy balances - Example of Heated mixing tank. Steady state and dynamic behaviour	Black-Board/NPTEL	Home Assignment Semester end exam	CO1						√ √
8	9	Form of Dynamic Models, Deviation variable formulation, Linearization of nonlinear models - Taylor series approximation	Black- Board	Home Assignment Semester end exam	CO1			√			

S.No	Lec No	Topic	Teaching Aid	Assessment	CO							
9	10	Development of linear Model - Examples of a second order reaction in CSTR and jacketed heater	Black- Board	Assignment Test Semester end exam	CO1							√
10	12	Dynamic Behaviour	Black- Board	Sessional Test Semester end exam	CO1	√						
11	13	Linear State Space Models - Stability – Example of Exothermic CSTR	NPTEL	Assignment Test Semester end exam	CO1					√		
12	14	Empirical models-First order + Dead time	Black- Board	Semester end exam Home Assignment	CO1		√					
UNIT-II												
13	15	Introduction, PID controller forms	Black- Board	Sessional Test Home Assignment Semester end exam	CO2		√					
14	16	Closed-Loop Oscillation-Based Tuning - Ziegler-Nichols and Tyreus-Luyben	Black- Board	Sessional Test Home Assignment Semester end exam	CO2			√				
15	17	Example of third order process - Comparison of Z-N and T-L responses for P, PI and PID controllers	Black- Board/ MATLAB	Home Assignment Sessional Test Semester end exam	CO2					√		
16	18	Tuning Rules for First-Order + Dead Time Processes - Z-N & C-C methods	Black- Board	Sessional Test Home Assignment Semester end exam	CO2			√				
17	19	Direct Synthesis (DS) procedure, DS for Minimum -Phase Processes - Example of first order process	Black- Board/ MATLAB	Sessional Test Home Assignment Semester end exam	CO2							√
18	20	Direct Synthesis for Non-minimum Phase Processes - Example of First Order plus Dead Time (FODT) process	Black- Board	Sessional Test Semester end exam	CO2							√
19	21	Direct Synthesis for Non-minimum Phase Processes - Example of Process with a RHP Zero and reformulation of the desired response	Black- Board	Sessional Test Semester end exam	CO2							√
20	23	PID control using MATLAB simulation and video on PID tuning methods	NPTEL/PPT	Home Assignment	CO2							√

No	No	Topic	Method	Assessment	CO							
21	24	Phenomenon and example of illustration of reset windup	PPT	Sessional Test Home Assignment Semester end exam	CO2					√		
22	25	Control block diagram for an auto tune relay switch, Relay dead band	PPT	Sessional Test Home Assignment Semester end exam	CO2		√					
UNIT-III												
23	26	Open loop model based control system - Static control law and dynamic control law	Black- Board	Assignment Test Semester end exam	CO3		√					
24	27	Practical Open-Loop Controller Design - Design procedure, Example of a first order process	Black- Board	Assignment Test Semester end exam	CO3							√
25	28	Issues in dynamic controller design - Example of inverse response system	Black- Board	Assignment Test Semester end exam	CO3				√			
26	29	Controller Factorization - Factorization techniques - simple and all- pass factorization	Black- Board	Assignment Test Home Assignment Semester end exam	CO3				√			
27	30	Comparison of output responses for different controller factorizations, Summary of controller design procedure	Black- Board	Assignment Test Home Assignment Semester end exam	CO3						√	
28	31	Example of first order process with model uncertainty	Black- Board	Home Assignment Semester end exam	CO3				√			
29	32	Block Diagram of IMC and list of variables	Black- Board	Assignment Test Semester end exam	CO3	√						
30	33	Steps in IMC design, Example of FODT process and second order with an RHP Zero	Black- Board	Assignment Test Home Assignment Semester end exam	CO3							√
31	34	Effect of model uncertainty and disturbances - Example of first order process - Setpoint response and disturbance response	Black- Board	Assignment Test Home Assignment Semester end exam	CO3					√		
32	36	Improved disturbance rejection design - Design procedure, Example of first order process	Black- Board	Assignment Test Semester end exam	CO3							√
33	37	Standard feedback diagram illustrating the	Black- Board	Home Assignment	CO3							√

		equivalence with IMC, Steps in IMC based PID control system design		Semester end exam										
34	38	IMC design using siso tool in MATLAB – Content beyond the syllabus	MATLAB	Home Assignment	CO3									√
				UNIT-IV										
35	39	Block diagram of Model Predictive Control (MPC)	NPTEL	Sessional Test Semester end exam	CO4	√								
36	40	Basic concept of MPC, Prediction Horizon and Control Horizon												
37	42	Objective functions - Least squares and absolute value	PPT	Sessional Test Semester end exam	CO4	√								
38	43	Models - Finite step and impulse response models - Illustration of step response and impulse response parameter identification, Obtaining impulse response models from step response data	PPT	Sessional Test Semester end exam	CO4					√				
39	45	Steps involved in implementing dynamic matrix control (DMC)	PPT	Sessional Test Home Assignment Semester end exam	CO4									√
40	46	Example of first order process – Effects of prediction horizon and model length	PPT	Sessional Test Home Assignment Semester end exam	CO4						√			
41	47	Brief introduction on advanced control and optimization techniques – Content beyond the syllabus	PPT	-										

K. Vijaya lakshmi
Course Coordinator

Sumalatha A
Module Coordinator

P Srinivas
Program Coordinator

G N
Head of the Department

HEAD
Dept. of Electronics & Instrumentation Engg
V.R. Siddhartha Engineering College
VIJAYAWADA-520 007

V R SIDDHARTHA ENGINEERING COLLEGE (Autonomous) :: Vijayawada-7
DEPARTMENT OF ELECTRONICS & INSTRUMENTATION ENGINEERING

Course code/Name: 17EI2605B Intelligent Instrumentation Principles and applications   Dt: 25.12.19
Class: III Year (II Semester), Section – A&B
Faculty Name: Mrs. Ch. Jaya Lakshmi

Lesson Plan/ Course Handout

S. No	Class No.	Topic Name	Delivery Method	Assessment Methods	Course Outcome Covered	K1	K2	K3	K4	K5	K6
						Cognitive levels of learning					
		UNIT-I									
1	1	Syllabus & COs, Overview	Black- Board/PPT	-	-						
2	2	Introduction	Black- Board/PPT	Assignment Test Semester end exam	CO1	√					
3	3	Classical sensors and transducers	Black- Board/PPT	Assignment Test Semester end exam	CO1		√		√		
4	4	Self generating transducers, Variable parameter transducers	Black- Board/PPT	Assignment Test Semester end exam	CO1		√		√		
5	6	Radioactive transducer	Black- Board/PPT	Assignment Test Semester end exam	CO1		√		√		
6	7	Semiconductor sensors	Black- Board/PPT	Assignment Test Semester end exam	CO1		√				
7	8	Array-based sensors	Black- Board/PPT	Assignment Test Semester end exam	CO1	√	√	√			
8	9	Biosensors	Black- Board/PPT	Assignment Test Semester end exam	CO1	√					
9	10	static characteristics	Black- Board/PPT	Assignment Test Semester end exam	CO1			√		√	√
10	11	Dynamic characteristics	Black- Board/PPT	Assignment Test Semester end exam	CO1			√		√	√
11	12	Input-Output impedances.	Black- Board/PPT	Assignment Test Semester end exam	CO1	√	√				

S.No		Topic	Teaching Method	Assessment Method	CO						
Unit-II											
12	13	Classification	Black- Board/PPT	Sessional Test / Semester end exam	CO2	√	√		√	√	
13	13	Smart sensors	Black- Board/PPT	Sessional Test / Semester end exam	CO2		√				
14	14	Cogent sensors	Black- Board/PPT	Sessional Test / Semester end exam	CO2		√	√			
15	16	Soft or virtual sensors	Black- Board/PPT	Sessional Test / Semester end exam	CO2		√	√	√		
16	18	Self-adaptive sensors	Black- Board/PPT	Sessional Test / Semester end exam	CO2		√	√	√		
17	19	Self-validating sensors	Black- Board/PPT	Sessional Test / Semester end exam	CO2	√	√				
18	20	Introduction	Black- Board/PPT	Sessional Test / Semester end exam	CO2	√	√				
19	22	Multidimensional intelligent sensors	Black- Board/PPT	Sessional Test / Semester end exam	CO2		√	√	√		
20	23	AI for prognostic instrumentation	Black- Board/PPT	Sessional Test / Semester end exam	CO2		√	√			
21	25	Fuzzy logic-based intelligent Sensors	Black- Board/PPT	Sessional Test / Semester end exam	CO2		√		√		
UNIT-III											
22	28	Analog linearization of positive coefficient resistive sensors	Black- Board/PPT	Assignment Test / Semester end exam	CO3	√	√		√	√	√
23	29	Linearization of negative coefficient resistive sensors	Black- Board/PPT	Assignment Test / Semester end exam	CO3	√	√			√	√
24	30	ANN-based linearization	Black- Board/PPT	Assignment Test / Home assignment / Semester end exam	CO3		√		√	√	
25	31	Sensor calibration	Black- Board/PPT	Assignment Test / Semester end exam	CO3	√	√				
26	33	Conventional calibration circuits	Black- Board/PPT	Assignment Test / Semester end exam	CO3	√	√		√	√	

S.No	L.No	Topic	Teaching Aid	Assessment Method	CO						
27	34	Multiplying DAC calibration	Black- Board/PPT	Assignment Test Semester end exam	CO3	√	√				
28	35	offset calibration	Black- Board/PPT	Assignment Test Semester end exam	CO3		√		√	√	√
29	36	Pulse modulated calibration	Black- Board/PPT	Assignment Test Semester end exam	CO3		√		√	√	√
30	37	ADC calibration	Black- Board/PPT	Assignment Test Semester end exam	CO3		√		√	√	√
31	38	STIM calibration	Black- Board/PPT	Assignment Test Semester end exam	CO3	√	√		√		
UNIT-IV											
32	39	Introduction	Black- Board/PPT	Sessional Test Semester end exam	CO4	√					
33	41	IEEE 1451 standard, Network technologies	Black- Board/PPT	Sessional Test Semester end exam	CO4	√	√		√		
34	42	CEBUS communication protocol for smart home	Black- Board/PPT	Sessional Test Semester end exam	CO4			√	√		√
35	43	Plug - n - play smart sensor protocols	Black- Board/PPT	Sessional Test Semester end exam	CO4			√	√		√
36	44	Tea fermentation process	Black- Board/PPT	Sessional Test Home Assignment Semester end exam	CO4			√		√	√	√
37	45	Self adaptive pressure sensor system	Black- Board/PPT	Sessional Test Home Assignment Semester end exam	CO4			√		√	√	√
38	46	Soft sensor for water treatment process,	Black- Board/PPT	Sessional Test Home Assignment Semester end exam	CO4			√		√	√	√
39	47	Oxygen sensor in industry and environment monitoring	Black- Board/PPT	Sessional Test Home Assignment Semester end exam	CO4			√		√	√	√

Course Coordinator   Module Coordinator   Program Coordinator   Head of the Department

P Srinivas

VELAGAPUDI RAMAKRISHNA SIDDHARTHA ENGINEERING COLLEGE (AUTONOMOUS)
VIJAYAWADA
Training & Placement Cell
Lesson Plan-2019-20 (II Semester)

Course: III B.Tech.
Branches: All Branches

Sub: QUANTATIVE APTITUDE
Sub code: 17TP1606

Month	I Week	II Week	III Week	IV Week	V Week	Remarks
November	$25^{th} - 30^{th}$	$2^{th} -7^{th}$	$9^{th} -14^{st}$	$16^{rd} - 21^{th}$	$23^{th} - 28^{th}$	
	Number system	HCF & LCM	Average Simplification	Percentages	Problems on ages	
December	$2^{th} - 7^{th}$	$9^{th} - 14^{th}$	16th- 21th	$23^{rd} -28^{st}$	-	
	Ratio & Proportion	Partnership	Profit & Loss	Time & Work	Pipes & Cistern Chain Rule	
January	Dec $30^{th} - 4^{th}$	$6^{th} -11^{th}$	$13^{th} - 18^{th}$	$20^{th} - 25^{th}$	$27^{th} -Feb\ 1^{st}$	27.1.2019 – 1.2.2020 I Sessional Exams
	Time & Distance	Boats &Steams Problems on Trains	Allegation	Simple interest and compound interest	Races & Games of skills	
February	$3^{rd} - 6^{th}$	$10^{th} -15^{th}$	$17^{th} - 22^{th}$	$24^{th} -29^{th}$		21.03.2020 -28.03.2020 II Sessional Exams
	Calendars and Clocks	Permutation and Combination	Probability	Geometry		
March	$2^{nd} -7^{th}$	$9^{th} -14^{th}$	$16^{th} -21^{st}$	$23^{rd} -28^{th}$		Last working day 28.03.2010.
	Areas	Volumes	Tabulation Bar graphs	Pie charts line graphs		

N DURGA PRASAD

P SUNEETHA

S SRIDEVI