RGPV (DIPLOMAWING) BHOPAL	OBE CURRICULUMFOR THECOURSE	FORMAT-3	Sheet No.1/5
Branch	**Electronics &Telecommunication engineering**	**Semester**	**5**
Course Code **E03**	**Course Name** **Instrumentation and Control**		

CourseOutcome1	Identify signal conditioning circuits, data acquisition circuits and telemetry systems.	Teach Hrs	Marks
Learning Outcome1	Compare different types of signal conditioning circuit and measuring system. **(Cognitive domain)**	8	10
Contents	Function of measuring systemwith Block diagram. Signal conditioning: DC and AC system withBlock diagram Data acquisition system (Block Diagram)		
Method of Assessment	External		
Learning Outcome2	Describe various types of telemetry.**(Cognitive domain)**	8	10
Contents	Introduction - Method of Data Transmission - General Telemetry System - Type of Telemetry System and brief description with block diagram of Land line: - current telemetry, voltage telemetry and position telemetry. R.F. telemetry system.		
Method of Assessment	External		

LearningOutcome3	Select and use differentsignal conditioning and data acquisition system. **(Psychomotor domain)**	6	10
Contents	Signal conditioning- Filters, ADC, DAC, voltage to current, current to voltage, voltage to frequency. Data acquisition system – Analog and Digital.		
Methodof Assessment	Internal		

RGPV(DIPLOMA WING) BHOPAL		**OBECURRICULUMFOR THECOURSE**		**FORMAT3**	**Sheet No.**2/5
Branch	**Electronics & Telecommunication Engineering**		**Semester**	**5**	
CourseCode	**E03**	**CourseName**	**Instrumentation and Control**		
Course Outcome2	Differentiate different type ofDisplays and recorders.			**Teach Hrs.**	**Marks**
LearningOutcome4	Select various types of Display devices.**(Cognitive domain)**			7	10
Contents	Working and block diagram of followingdisplays devices: - Analog Indicator /Displays - Digital indicator/Display - Light Emitting Diodes - Liquid Crystal Displays - Seven Segment and Fourteen Segment				
Methodof Assessment	External				
LearningOutcome5	Select specific recorders for various application. **(CognitiveDomain)**			6	10

Contents	Working and block diagram of recorders: - Graphic Recorders - Strip chart recorders - X-Y Recorders		
Method of Assessment	Internal		
LearningOutcome6	Analyze various physical signal using different types of Recorders. **(psychomotor domain)**	6	10
Contents	Observe different types of physical signal using various types of recorders and/or on simulator.		
Method of Assessment	Internal		

RGPV (DIPLOMA WING) BHOPAL	OBECURRICULUM FOR THECOURSE	FORMAT3	Sheet No.3/5

Branch	Electronics & Telecommunication Engineering	Semester	5

CourseCode	E03	CourseName	Instrumentation and Control

CourseOutcome3	Describe control system and it's transfer function	Teach Hrs.	Marks
LearningOutcome 7	Define control systems and Laplacetransform.**(Cognitive domain)**	7	10
Contents	Open and closed loop control system and their merits and demerits, Blockrepresentation of simple systems, Laplace transforms of someimportant functions (without derivation)		
Method of Assessment	External		
LearningOutcome8	Calculate the gain of a given control system.**(CognitiveDomain)**	6	10
Contents	Block diagram reduction technique, Signal flow graph of simple control systems, Mason's gain formula. Transfer function of electrical, mechanical and electromechanical system,pneumatic system(without derivation)		
Methodof Assessment	External		
LearningOutcome9	Observe various physical quantities with the help of temperature transducer**(PsychomotorDomain)**	6	15
Contents	Observe the temperature signal waveform with the help of thermocouple, RTD and thermistor.		
Method of Assessment	External		

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RGPV (DIPLOMA WING)BHOPAL	OBECURRICULUM FOR THECOURSE	FORMA T3	Sheet No.4/5

Branch	Electronics & Telecommunication engineering	Semester	5

Course Code	E03	Course Name	Instrumentation and Control

Course Outcome 4	Perform time domain analysis of given control system	Teach Hrs.	Marks
LearningOutcome10	Identify the type and order of given control system.**(Cognitive domain)**	6	10
Contents	Time domain analysis- Type and order of a control system, typical testsignals for time response analysis of a control system(Unit step, Unit rampand unit impulse)		
Method of Assessment	External		
LearningOutcome11	Explain response of first and second order control system. **(Cognitive domain)**	6	10
Contents	Time response of first and second order control systems, steady stateerror- static and dynamic error coefficients, transient responsespecifications of second order control system. (without derivation)		
Method of Assessment	Internal		
LearningOutcome 12	Classify various controllers **(Cognitivedomain)**	6	10
Contents	Basic ideas of proportional, derivative and integral controllers and electronic PID controllers.		
Method of Assessment	Internal		

RGPV(DIPLOMA WING)BHOAL		OBECURRICULUM FOR THECOURSE		FORMAT 3	Sheet No.5/5
Branch	**Electronics & Telecommunication engineering**			**Semester**	**5**
CourseCode	**E03**	**CourseName**	**Instrumentation and Control**		
CourseOutcome5	Test the stability of a given control system			Teach Hrs.	Marks
LearningOutcome 13	Determine stability using Routh Hurwitz criterion. **(Cognitive domain)**			6	10
Contents	Concept of stability, Routh Hurwitz criterion- different cases andconditions, numerical problems				
Methodof Assessment	External				
LearningOutcome 14	Demonstrate the working of Air conditioner system**. (Psychomotor Domain)**			6	15
Contents	Air conditioner system- flow control, humidity control, pressure control, temperature control.(Case study)				
Methodof Assessment	External				

Suggested List of Experiment:

S.N.	Experiment
1	To measure pressure ,load and force
2	To measure displacement, strain and stress
3	To observe the effect of temperature on the resistance of thermistor
4	To measure various physical quantities using recorders
5	Analysis of Proportional + Integrator + Derivative (PID) control actions for First and second order systems.
6	Demonstrate the operation of PD controller. Demonstrate the operation of PI controller. Demonstrate the operation of PID controller
7	To draw the block diagram of sequential control system
8	To study a microprocessor controlled industrial control system.
9	Visit to Industrial units where instrumentation and control system is utilized

Suggested list of books:

S.N .	Title&Publication	Author
1	J. L. Melsa& D. G. Schultz, —Linear Control Systems‖, McGraw Hill, New York, 1969	J. L. Melsa& D. G. Schultz
2	I. J. Nagrath& M. Gopal, —Control Systems Engineering‖, fi□h edition, New Age International (P) Ltd, New Delhi, 2009.	I. J. Nagrath& M. Gopal
3	Joseph J. DiStefano, Allen R. Stubberud, Ivan J. Williams. —Schaum's outline of theory and problems of feedback and control systems□, McGraw	Joseph J. DiStefano, Allen R. Stubberud, Ivan J. Williams
4	JStubberud, Ivan J. Williams. —Schaum's outline of theory and problems of feedback and control systems□, McGraw	JStubberud, Ivan J. Williams
5	nptel.ac.in	
6	swayam.gov.in	