

PLANNED SYLLABUS COVERAGE (Theory)

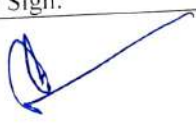
GK Ka SYL CON		ra BUS RAGE		Department: Instrumentation Engineering Subject : Industrial Instrumentation-II			26 NOV 2025
Course : Diploma Program Core.				Duration: 3 Yrs. 4 Aug to			
Total Period: 56 (4 per week*14 weeks)				Theory : 56			
Sr. No.	Period nos	Topic	Details	Instruction Reference	Additional Study Recommended	Rema s	
1	10Hrs	Basic Flow Measurement Techniques	Basic Flow Measurement Techniques Basic Concept of Bernoulli Equation. Methods of Flow Measurement: Variable Head/Differential Pressure/Obstruction Type Flow Meters: Basic Operating Principle Concept of Pressure Head. Primary Elements of Differential Flow Meters: Orifice Plate, Venturi Tube, Flow Nozzle, Pitot Tube. Variable Area Flow Meter: Rotameter.	Industrial Instrumenta tion and Control; S. K. Singh; TMH. Instrumenta tion Measureme nt and Analysis; B. C. Nakra and K. K. Chaudhary; TMH. Industrial Instrumenta tion; Umesh Rathore S. K. Kataria	Internet		
2.	14 Hrs	Miscellaneous Flow Measurement	Miscellaneous Flow Measurement Velocity Type Flow Measurement:- Electromagnetic Flow Meter. Turbine Type Flow Meter. Target Type Flow Meter. Ultrasonic Flow Meter. Vortex Type Flow Meter. Anemometer Mass Flow Measurement:- Coriolis Mass Flowmeter. Impact Type Mass Flowmeter, Positive Displacement Flowmeter, Open Channel Flow Measurement Technique.		-----do-----		
3.	12 Hrs	Basic Pressure Measurement Techniques	Basic Pressure Measurement Techniques Manometer: U Tube Manometer, Barometer, Inclined Manometer, Well Type Manometer. Elastic Pressure Transducers: Bourdon Tube: C-Type Bourdon Gauge, Diaphragm, Bellow Type. Force Balance Type: Dead Weight Tester		-----do-----		
4.	14 Hrs	Miscellaneous Pressure Measurement	Miscellaneous Pressure Measurement Electrical Type Pressure Measurement Technique: Strain Gauge Pressure		-----do-----		

Dr. P. S. K. Kataria
26/11/2025

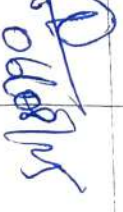
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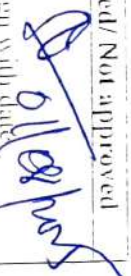
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5	6 hrs	Transducer. Potentiometric Pressure Transducer. Capacitive Pressure Transducer. LVDT Type Pressure Transducer. Measurement of Vacuum: Pirani Gauge. Capsule Gauge. McLeod Gauge. Thermal Conductivity Gauge Class Tests Revision Problem Solving.		-----do-----	
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Approved	HOD Sign.
Date: 01/08/2024	

C P Kangra
 Practical Planning & Coverage status
 Department: Indus. Engg.
 Course: Program core,
 Laboratory: Advanced Control Lab
 Subject: Industrial Instrumentation-II

Sr. No.	Details of Practical	Availability of		Likely Turn/Date	Actual Date	Responsibility	HOD Sign.	Remarks
		Equipment Set up	STD Ref. Write up					
01	To observe the working of Rotameter (Variable area flowmeter) for any fluid flow	PCT-Transformer Experimental kit	Text book & Rotameter data sheet / manual	G1: 1 st , 2 nd G2: 1 st , 2 nd	G2: 6/8/25	Naseer		
02	To observe & measure flow rate using turbine type flowmeter	-do-	-do-	G1: 3 rd , 4 th G2: 3 rd , 4 th				
03	To study the Bourdon tube type pressure gauge & identify its parts	C-type Bourdon gauge	-do-	G1: 5 th , 6 th G2: 5 th , 6 th				
04	To study the construction of Dead weight tester and its use in the calibration of field instruments	Dead weight Tester	-do-	G1: 7 th , 8 th G2: 7 th , 8 th				

Approved/ Not approved

 HOD Sign with date

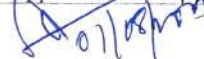
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Course:

Subject:

Sl. No.	Details of Practical	Availability of		Likely Turn/Date	Actual Date	Responsibility	HOD Sign.	Remarks
		Equipment Set up	STD Ref. Write up					
05	To study the positive displacement type flow-meter	—	Text Book	G1: 9th G2: 9th				
06	To study different manometer	U-tube Manometer	— do	G1: 10th G2: 10th				
07	Revision	—	—	G1: 11th G2: 11th				
08	— do —	—	—	G1: 12th G2: 12th				
09	— do —	—	—	G1: 13th G2: 13th				
10	— do —	—	—	G1: 14th G2: 14th				

Approved/ Not approved



HOD Sign with date



Principal Signature with date

PLANNED SYLLABUS COVERAGE(Theory)

GP-K-F-17

G P Kangra		Department: <u>Instrumentation & Subject</u> <u>Process Control-II</u>				
SYLLABUS COVERAGE		Course <u>Program Core</u> Duration <u>6 months</u>				
		Total Periods <u>56</u> Theory <u>56</u>				
Sr. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
1	1-8 (8)	Controller Tuning	1.1 Selection of Control Mode 1.2 Criterion of good control ISE, IAE, ITAE 1.3 Process reaction curve (Cohen Coon method) 1.4 Z-N Method	Process system Analysis & control Donald R. Cougha Mc-Graw Hill	www.nptel.com	
2	9-22 (14)	Process Control Components	2.1 Intro to elements of the final control - signal conversion elements actuators & control elements. 2.2 Electromechanical relay 2.3 Pneumatic Flapper Nozzle system & its application as I/P converter 2.4 Pneumatic relays 2.5 Solenoid Coil 2.6 Pneumatic cylinder Single & Double acting		—do—	
3	23-32 (10)	Control Valve	3.1 Intro to control valve 3.2 Control valve construction 3.3 Valve sizing 3.4 Control valve sizing 3.4.1 Equal %age Valve 3.4.2 Quick opening valve 3.4.3 Linear Valve 3.5 Valve positioner 3.6 Basic selection criteria for control valves	—do—	—do—	
4	33-43 (11)	Hydraulic Pneumatic Electronic controllers	4.1 Intro to Hydraulic - Pneumatic - Electronics controllers 4.2 Comparison of hydraulic & Pneumatic Systems 4.3 Concept of hydraulic proportional controller 4.4 Concept of Pneumatic proportional controller 4.5 Concept of Electronic proportional controller	—do—	—do—	

To be approved from concerned HOD within seven days from beginning of semester & will be kept with the concerned teacher in his file.

Dr. J. K. Singh
HOD (EE)

Sr. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
5	44-55 (12)	Miscellaneous Topics of Process Control	5.1 Some basic example of process control system Heat exchanger, stirrer tank & liquid level control 5.2 Control objectives - Safety, environmental, protection equipment protection, smooth plant operation, product quality, profit optimization, monitoring & Diagnosis 5.3 Benefits of process control system 5.4 Process control laws 5.5 Basic idea of levels of process control systems.	dw	db	

Extra Topics to be covered beyond the scope of the syllabus (as required by industry/ as recommended by Teacher which he/ she finds necessary)

Sr. No.	Period No.	Topic Covered	Instruction Reference	Additional Study recommended	Remarks
1	56 (1)	Controller design	Karl J. Aström & Tore Hågglund ISA	www.nptel.com	

Approved / Not approved	
Date 01/08/2015	HOD Sign 
Date	Principal Sign 

Use additional sheets (if required).

Practical Planning & Coverage Status

Department: Instrumentation Engg. Laboratory: Process Control-I Lab
 Course: Programmable Controller Subject: Process Control-II

Sr. No.	Details of Practical	Availability of		Likely Turn/Date	Actual Date	Responsibility	HOD Sign.	Remarks
		Equipment Set up	STD Ref. Write up					
1	To familiarize with NO-COM-NC contact of a relay & observe its working	Trainer Kit	Lab. Manual	G1: Wednesday G2: Thursday				
2	To familiarize with various solenoid coil, Limit switch, simple acting pneumatic cylinder & double acting cylinder and observe their working on application of pneumatic air supply	Trainer Kit	Lab. Manual	G1: Wednesday G2: Thursday				
3	To observe linear relationship b/w analog input (4-20 mA) & pneumatic O/P (3-15 psi) of an I/P converter	Trainer Kit	Lab. Manual	G1: Wednesday G2: Thursday				
4	To study & observe important components of PCS like sensors I/P converter, control valve	Trainer Kit	Lab. Manual	G1: Wednesday G2: Thursday				
5	To operate any temperature control system & observation the functioning of controller final control element & feed back element	Trainer Kit	Lab. Manual	G1: Wednesday G2: Thursday				

Approved/ Not approved


 HOD Sign with date


 Principal Signature with date

Practical Planning & Coverage Status

Laboratory:

Subject: process Control - II

Department: Instrumental
Course: Program Core

Approved/ Not approved

HOD Sign with date

11/10/20

Principal Signature with date

PLANNED SYLLABUS COVERAGE(Theory)

G P Kangra		Department: <u>Insten. Engrs.</u> Subject <u>AI&U</u>				
SYLLABUS COVERAGE		Course <u>Program Elective</u> Duration <u>06 months</u>				
		Total Periods <u>56 (Th.)</u> Theory <u>56</u>				
Sr. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
01	10 (01 to 10)	Basic Fundamentals	- Introduction - Need of Instrumentation - Adv. of Inst. & Plant Automation - Role of an Instrumentation Engineer in Industry - P&ID/Instrumentation Symbols - Basic P&ID Diagram - P, L, Temp., Flow, Control loop.	Process Control Inst. Tech. by Crestis D. Johnson (PHE) Process Control by Sreebha Banerjee (Oxford)	Instrument Engineers Handbook by Bela G. Liptak (C.R.C. Press)	
02	12 (11 to 22)	Selection of Instruments + CT-I	Selection of instruments (their criteria) as per requirement for measurement of:- Pressure, Level, Flow, Temp., pH & Speed.	- do -	- do -	
03	14 (23 to 36)	Inst. in Plant Utilities + CT-II	Inst. used in following utilities in plant:- L) Boiler (Steam Generator) L) Water Treatment (DM & RO Plant) L) Air Compressor & Air Distribution system L) Fuel Storage & forwarding system L) MVAC & Chiller system	- do -	- do -	

To be approved from concerned HOD within seven days from beginning of semester & will be kept with the concerned teacher in his file.

01/08/2021
HOD (EE)

PLANNED SYLLABUS COVERAGE(Theory)

G P Kangra		Department: <u>Instn. Engg.</u> Subject <u>AZ & U</u>				
SYLLABUS COVERAGE		Course <u>Process Elective</u> Duration <u>06 Months</u>				
		Total Periods <u>56 (Th.)</u> Theory <u>56</u>				
Sr. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
04.	10 (37 to 46)	Erection & Commissioning of Instruments	- Intro. to Erection & Commissioning - Pre-Requirement for Erection/Installation - Pre requirement for Commissioning. - Study of Hook up drawing, P&ID and Control write up - Loop Checking - Concept of Instrument earth & Power earth - Need of Calibration of Instruments - Check points for first start up - Task of Commissioning engineer at site.	- do -	- do -	
05.	10 (47 to 56)	Maintenance of Instruments	- Objectives of Maintenance - Types of Maintenance ↳ Planned & Unplanned - Breakdown Maintenance - Preventive Maintenance ↳ Periodic & Predictive - Comparison b/w Preventive & Breakdown maintenance, Planned & unplanned maintenance - Std. Apparatus used for Calibration ↳ Dead wt. Tester for Pressure measurement or Pressure measuring instruments	- do - + Online Resources	- do -	

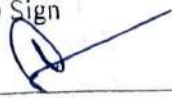
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At 6/8/2015
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Sr. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
			- Constant temp. bath for Temp. meas. inst. - Imp. points to be considered for maintenance of various field inst. like $\rightarrow$ Pt. Gauge $\rightarrow$ Pt. Transmitter $\rightarrow$ Temp. Indicator $\rightarrow$ RTD $\rightarrow$ Thermocouple $\rightarrow$ Level Gauge $\rightarrow$ Level Tx. $\rightarrow$ Flow Tx.	- de -	- de -	

Extra Topics to be covered beyond the scope of the syllabus (as required by industry/ as recommended by Teacher which he/ she finds necessary)

Sr. No.	Period No.	Topic Covered	Instruction Reference	Additional Study recommended	Remarks

Approved / Not approved	
Date 01/08/2021	HOD Sign 
Date 01/08/2021	Principal Sign 

Use additional sheets (if required).

G P Kangra

Practical Planning & Coverage Status

Department: Instn. Engg.
 Course: Process Control
 Laboratory: Measurement Lab
 Subject: AI & U Lab

Sr. No.	Details of Practical	Availability of		Likely Turn/Date	Actual Date	Responsibility	HOD Sign.	Remarks
		Equipment Set up	STD Ref. Write up					
1.	To prepare chart to tabulate various P&ID Symbols.	—	Std. P&ID Symbols (ANSI)	G1: Mon. G2: Tue.	11/08/2021	—		
2.	To prepare chart for any pressure control loop.	—	NPT I NPT L Notes	G1: Mon G2: Tue				
3.	To prepare chart for any level control loop.	—	— do —	G1: Mon G2: Tue				
4.	To prepare chart for any flow control loop.	—	— do —	G1: Mon G2: Tue				
5.	To prepare chart for any temp. control loop.	—	— do —	G1: Mon. G2: Tue.				
6.	To interface any process control system with PC through any communication medium and to observe its working for any temp./flow/level control loop.	Process Control Trainer used	Std. Training kit manual	G1: Mon G2: Tue				

Approved/ Not approved

01/08/2021
 HOD Sign with date

01/08/2021
 Principal Signature with date

Practical Planning & Coverage Status

Department: Instru. Engg.

Laboratory: Measurement Lab

Course: Programmable Electronics

Subject: Applied Instru. & Electronics Lab (AI&ULab)

Sr. No.	Details of Practical	Availability of		Likely Turn/Date	Actual Date	Responsibility	HOD Sign.	Remarks
		Equipment Set up	STD Ref. Write up					
7.	To operate pneumatic type process control components through compressed air.	Electro - Pneumatic Trainer	— do —	91: Mon 92: Tue.				
8.	To study the concept of calibration	Deadweight Std. Tester		91: Mon 92: Tue.				

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Principal Signature with date

PLANNED SYLLABUS COVERAGE(Theory)

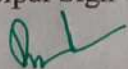
G I Ka ngra		Department: <u>Instrumentation Engg</u> Subject <u>PE-4 (Biomedical Instrumentation)</u>				
SYI ABUS CO RAGE		Course <u>Program Elective-IV</u> Duration <u>06 months.</u> <u>14 weeks.</u>				
		Total Periods <u>TL(56), P(28)</u> Theory <u>56</u>				
Sr. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
01	12.	Introduction to Biomedical Instrumentation	• Sources/origin of Bio-Medical Bio-Electric signals. • Generalized block diagram of biomedical instrumentation system. • Various types of bio-medical electrodes. • Basics of Pulse rate measurement. • Blood Pressure measurement using sphygmomanometer and stethoscope. • Basic concept of Telemedicine technology and its applications. • Role of engineers in Health care facilities.	Handbook of BMI by R.S.Khand -pub	Introduction to Medical Electronics by Mandeep Singh.	
02.	12.	Electrocardiography.	• Introduction to ECG, ECG signals. • ECG Machine block diagram • ECG Record Analysis, Applications	—do—	—do—	
03.	10	Electromyography.	• Introduction to EMG, ENG signals. • EMG block diagram, Applications -ns.	—do—	—do—	
04.	10	Electroencephalography.	• Introduction to EEG, EEG signals.	—do—	—do—	

To be : moved from concerned HOD within seven days from beginning of semester & will be kept with the concerned teacher in his

Sr. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
5.	12.	Miscellaneous Medical Equipment	• EEG Machine block diagram • Applications • CT Scan: CT Scanners • Principle, block diagram, Working and applications. • Pacemakers: Principle of Operation and need of pacemaker • Different types of pacemaker • Defibrillators, Principle, Operation, need of defibrillator • Different types of defibrillator • Pulse oximeter		— do — — do —	

Extra Topics to be covered beyond the scope of the syllabus (as required by industry/ as recommended by Teacher which he/ she finds necessary)

Sr. No.	Period No.	Topic Covered	Instruction Reference	Additional Study recommended	Remarks

Approved / Not approved	
Date 01/08/2018	HOD Sign 
Date	Principal Sign 

Practical Planning & Coverage Status

Department: Instrumentation Engg.

Laboratory: Instrumentation Lab.

Course: Diploma in I.E. Program Elective

Subject: Biomedical Instrumentation.

Sr. No.	Details of Practical	Availability of		Likely Turn/Date	Actual Date	Responsibility	HOD Sign.	Remarks
		Equipment Set up	STD Ref. Write up					
①	To observe the concept of blood pressure measurement using sphygmomanometer & stethoscope	Sphygmomanometer, stethoscope	Trainer manual	G ₁ Tuesday G ₂ Monday				
②	To measure the Heart Rate using ECG with Heart Rate monitor Trainer.	Heart rate trainer with leads	— do —	G ₁ Tuesday G ₂ Monday				
③	To study ECG & to observe the working of ECG machine, Trainer.	ECG trainer, Electrodes, Batteries	— do —	G ₁ Tuesday G ₂ Monday				
④	To analyse ECG recorded on ECG Machine.	— do —	— do —	G ₁ Tuesday G ₂ Monday				
⑤	To study EMG & to observe the working of EMG Machine / Trainer.	EMG Trainer, Electrodes, Batteries	— do —	G ₁ Tuesday G ₂ Monday				

Approved/ Not approved

HOD Sign with date

Principal Signature with date

Practical Planning & Coverage Status

Department:

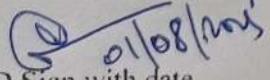
Laboratory:

Course:

Subject:

Sr. No.	Details of Practical	Availability of		Likely Turn/Date	Actual Date	Responsibility	HOD Sign.	Remarks
		Equipment Set up	STD Ref. Write up					
⑥	To study EEG & to observe the working of EEG Trainer.	EEG trainer set up, Electrodes, Batteries Connectors.	Trainer manual	1 st , Tuesday 1 st , Monday				
⑦	To observe the working of Pulse oximeter & to measure the oxygen level using it.	Pulse Oximeter	-do-	1 st , Tuesday 1 st , Monday				

Approved/ Not approved


 HOD Sign with date


 Principal Signature with date

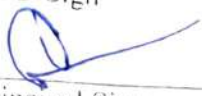
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To be approved from concerned HOD ^{-then attach} within seven days from beginning of semester & will be kept with the concerned teacher in his file.

Sl. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
04	13 (32-44)	Illumination for Interior or Applications	Transformer & their types, Dimmer Transformer, Auto transformer dimmer, two winding transformer dimmer, Electronic dimmer - brief introduction & applications only. Standards for various location of interior illumination. Design consideration for interior location of residential, commercial & Industrial premises.	2010 IES Lighting Code 2010 IES Illumination Engineering & Luminaires	Lighting Engineering applied calculations by R.H. Simons & A.R. Bean.	

Extra Topics to be covered beyond the scope of the syllabus (as required by industry/ as recommended by Teacher which he/ she finds necessary)

Sl. No.	Period No.	Topic Covered	Instruction Reference	Additional Study recommended	Remarks
		NA			

Approved / Not approved	
Date 04/08/2025	HOD Sign 
Date 04/08/2025	Principal Sign 

* If additional sheets (if required)

PLANNED SYLLABUS COVERAGE(Theory)

G P Kangra		Department: Instru. Engrg.		Subject Illumination Practices	
SYLLABUS COVERAGE		Course Open Elective		Duration 6 months	
Sr. No.		Period Nos.		Total Periods 56 (42-Lecture 14-Practical)	
Topic		Details		Instruction Reference	
Additional Study Recommended		Remarks			
05 12 (45-56)		Illumination scheme for different interior or locations of Residential, Commercial & industrial unit.		Handbook of Advanced lighting Technology by Robert Kazdick, Ching-Cheng Sun, Georges Zissis, Ringing Md.	
on for interior applications.		Factory lighting, Street lighting (latest technology), Flood lighting, Railway lighting, Agriculture & Horticulture lighting, Health care centres, Hospital, Decorating Purposes, Stage lighting.		IS: 2040: 1975, IS-3646 (Part-1), 1992, IS: 3646 (Part-2) 1996, IS 5572: 1994, IS: 6060-1971, IS 10322 (Part 1): 1982, IS: 2670: 1966, IS: 6665: 1972, IS: 1885 (Part 1 & 2): 1970.	
END					

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Sr. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks

Extra Topics to be covered beyond the scope of the syllabus (as required by industry / as recommended by Teacher which he/ she finds necessary)

Sr. No.	Period No.	Topic Covered	Instruction Reference	Additional Study recommended	Remarks
		NA			

Approved / Not approved	
Date 01/08/2025	HOD Sign 
Date 04/08/2025	Principal Sign 

Use additional sheets if necessary.