

PLANNED SYLLABUS COVERAGE(Theory)

G P Kangra		Department: <u>Instrumentation Engg.</u> Subject: <u>Electrical circuit</u>				
SYLLABUS COVERAGE		Course <u>Program Core</u> Duration <u>06 months</u>				
		Total Periods <u>T:42, P:42</u> Theory <u>42</u>				
Sr. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
01	09 (01-09)	Intro to basic fund.amentals.	Intro. to Elec. ckt (overview) Definition & units of voltage current Power power factor Energy Basic concept of RLC Basic concept of series & parallel combination of passive elements Basic concept of AC & DC ohm's law.	Principles of Elec. engg. & Electronics by V.R. Mehta (S. Chaud) & Elec. Tech-I by B.L. Theraja	www.nptel.com	
02	09 (10 to 18)	Circuit Analysis	KCL, KVL Thevenin theorem Norton theorem Superposition theorem Max. power transfer theo	-do-	-do-	
03	08 (19 to 26)	Fundamentals of AC ckt	Instantaneous, Avg. & RMS value of voltage / current. Form factor & peak factor Concept of power triangle Law of Electromagnetic Induction Basic concept of 1- ϕ & 3- ϕ circuit	-do-	-do-	
04	08 (27 to 34)	Transformer	Transformer: principle construction, working - types of transformer step up & step down Auto transformer Theory, advantage & Disadvantage, application	-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.

Sr. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
05	08 (35 to 42)	AC/DC Devices	DC motor principle, construction working AC motor principle basic operation of 1- ϕ induction motor 3- ϕ induction motor principle construction 4 working	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
—	—	—	—	—	—

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Date 07/08/2026	HOD Sign 
Date 03/08/26	Principal Sign 

Use additional sheets (if required).

Department: Instrumentation Engg.
 Course: Program Core
 Practical Planning & Coverage Status
 Laboratory: Advance Control Lab
 Subject: Electrical circuit 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.	Measurement of voltage & current in AC & DC Electric circuit	Std. Elec. Ckt Setup	Std. Book	G2-Monday G1-Tuesday	G2-03-8-26 G1-04-8-26	Kanwar		
2.	Measurement of passive comp. parameters like R, L & C	—	—	G2-Monday G1-Tuesday	G2-10-8-26 G1-11-8-26	Kanwar		
3.	Measurement of Power & PF in 1- ϕ electric ckt	—	—	G2-Monday G1-Tuesday		Kanwar		
4.	Verification of Ohm's Law in an Electric ckt.	—	—	G2-Monday G1-Tuesday		Kanwar		
5.	Measurement of output voltage of any step down transformer	—	—	G2-Monday G1-Tuesday				
6.	To observe the output variation of Auto transformer by varying no. of turns	—	—	G2-Monday G1-Tuesday				
7.	Use voltmeter & ammeter to measure KVL & KCL in electric ckt	—	—	G2-Monday G1-Tuesday				

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PLANNED SYLLABUS COVERAGE (Theory)

C K SY CO	ngra ABUS ERAGE	Department: Instrumentation Engineering Instruments		Subject: Electrical & Electronic		
		Course : Program Core		Duration: 01/08/26 to 28/11/26		
		Total Period: 42 (3 per week * 14 weeks)-T 42 (3 per week * 14 weeks)-P		Theory : 42, Practical: 42		
Sr. No	Period Nos	Topics	Details	Instruction Reference	Additional Study Recommended	Remark
1.	10HRS	Basics of Electrical Instruments	Electrical quantities & instruments for their measurements. Types of Electrical measuring Instruments - Indicating, Integrating & Recording Instruments. Essentials of - Indicating Instn. - Deflecting, Controlling Damping Torques. Classification of Instruments - PMMC, MI, Electrodynamometer, hot wire, Thermo couple, Induction, Electrostatic & Rectifier Type.	A Course in Electrical Measureme nt and Measuring Instruments; AK Sawhney; Dhanpat Rai Publication	Internet	
2.	10HRS	Electrical measuring Instn. I	PMMC Type Ammeter & Voltmeter, Dynamometer type wattmeter, Induction type Energy meter.	Electronic Instrumentat ion and Measureme nt Technique; W. D. Cooper & A.D. Helfri ck; Pearson.		
3.	6HRS	Electrical measuring Instn. - II	Megger, Earth Tester P.f. meter, Frequency meter, Tong Tester			
4.	6HRS	Instrument Transformer	Current Transformer & its need in measurements. Potential Transformer & its need in measurements.	Electronic Instrumentat ion; H.S. Kalsi; McGraw Hill		
5.	4HRS	Electronic Instruments	Digital Multimeter CRO or DSO Function Generator.			
6.	6 Hrs		Class Test I, Class Test 2 Doubt clear & Revision.			
Approved Date: 03/08/2024			HOD Sign. 			

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Signature of Principal



Practical Planning & Coverage

Department: Instrumentation Engineering

Course: Program core

Laboratory: Measurement Lab.

Subject : Electrical & Electronic Instruments

Sr.N o.	Details of Practical	Availability of		Likely Turn/Date	Actual Date	Responsibility	HOD Sign.	Remarks
		Equipment Set up	STD Ref. Write up					
1.	Use of Ammeter, Voltmeter & wattmeter in a Electric Ckt.	Ammeter Voltmeter Watt met. Auto trans Rheostat	Book.	Every Monday 9 I.				
2.	To observe the functionality of operation of Digital Multimeter	Multimeter & Electronic components	Manual	Every Tuesday 9 II				
3.	To observe the functionality of DSO/CRO.	DSO/CRO	Manual	(11:25 AM to 3:20 PM)				
4.	Measurement of voltage & frequency of a sinusoidal signal using CRO/DSO.	—do—	—do—	—do—				
5.	To plot Lissajous Pattern on CRO/DSO.	—do—	—do—	—do—				
6.	Meas. of Energy using 1 ϕ Energy meter for R Load for certain time duration.	1 ϕ Energy meter & Load. Internet	Book & Manual	—do—				
7.	To demo. the working of Meggar	Megger & Motor.	—do—	—do—				
8.	To demo the working of Earth Tester	Earth Tester	—do—	—do—				

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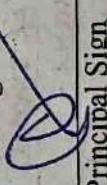
PLANNED SYLLABUS COVERAGE(Theory)

G P		Department: <u>Instrumentation</u> Subject <u>Transducers</u>				
Kangra		Course <u>Perogram Core</u> Duration <u>06 months</u>				
SYLLABUS COVERAGE		Total Periods <u>T: 56, P: 42</u> Theory <u>T: 56</u>				
Sr. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
1	1-11 (11)	Intro. to Transducers	1.1 Intro to transducers / instrumentation & gen. measurement system. 1.2 Basics of sensors & Transducers 1.3 Classification of Trans. 1.4.1 Variable resistance Transducers 1.4.2. Variable inductive Tx 1.4.3 Variable capacitance Tx 1.4.4. Piezoelectric Transducer basic properties piezo crystals	An intro. to mecal. measurement & Instru-mentation by Arun K. Ghosh	www.nptel.com	
2	12-25 (14)	Transducer based on R, L & C & inductive effects	2.1 Variable Resistance Tx 2.1.1 Potentiometer 2.1.2 Hot wire anemometer 2.1.3 Photo resistor 2.1.4 Resistance thermometer 2.2 Variable Inductive Tx LVDT 2.3 Variable capacitance Tx 2.3.1 Pressure measurement 2.3.2 Liquid level measurement	-do-	-do-	
3	26-33 (8)	Transducer based on Piezo-electric & piezoresistive effect	3.1 Piezoelectric Transducer 3.2 Piezoresistive Transducer 3.3 Application of strain gauge as load cell	-do-	-do-	
4	34-43 (10)	Other Transducers	4.1 Hall effect Transducer 4.2 Optical shaft Encoder 4.3 Tachometer 4.4 Synchro 4.5 Concept of smart Transducers	-do-	-do-	
5	44-55 (12)	Signal conditioning	5.1 Basic concept and need of signal conditioning 5.2 Basic of operational amplifier, inverting & non-inverting config.	-do-	-do-	

Sr. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
			5.3 Opamps with negative feedback 5.4 Applications of op-amp in signal conditioning 5.4.1 voltage follower 5.4.2 Integrator 5.4.3 Differentiation 5.4.4. Summing amplifier 5.4.5 Difference amplifier 5.4.6 I to V & V to I converter			

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
—	—	—	—	—	

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Date 03/08/2026	HOD Sign 
Date 03/08/26	Principal Sign 

Use additional sheets (if required).

G P Kangra
 Practical Planning & Coverage Status
 Laboratory: Advance Control Lab.
 Subject: Transducers Lab.
 Department: Instrumentation Engg.
 Course: Programmable Logic Controller

Sr. No.	Details of Practical	Availability of		Actual Date	Responsibility	HOD Sign.	Remarks
		Equipment	STD Ref. Write up				
1	To observe the output of potentiometer with variation of slider contact	Tester	Lab Manual	41-Wednesday 42-Thursday	Kumar		
2	To observe the working of any variable cap. Tx	dc	dc	41-Wednesday 42-Thursday			
3	To observe the working of any variable cap. Tx	dc	dc	41-Wednesday 42-Thursday			
4	To observe the working of synchro's	dc	dc	41-Wednesday 42-Thursday			
5	To demonstrate the working of strain gauge	dc	dc	41-Wednesday 42-Thursday			
6	To observe the output of op amp as voltage follower	dc	dc	41-Wednesday 42-Thursday			
7	To observe the output of op amp as summing amp.	dc	dc	41-Wednesday 42-Thursday			
8	To observe the output of op amp as diff. amp.	dc	dc	41-Wednesday 42-Thursday			

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PLANNED SYLLABUS COVERAGE(Theory)

GP		Department: Instru. Engg.	Subject: Digital Logic Design			
Kangra		Course: IEPD 207 (Program)	Duration: 01.08 to 28.11			
SYLLABUS COVERAGE		Total Periods: 56 (Th: 42, Pr: 14)	Theory: 42 (G1&G2) Practical			
Sr. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
01	08 (1 to 8)	Basics of digital logics	Introduction to analog & digital signals, comparison of digital & analog systems. Basics concepts of binary logic. Number system:- Decimal; Binary; octal, hexadecimal. Concept of BCD & Grey Code. Binary addition, multiplication & division. Concepts of 1's & 2's Complement.	1. Digital Electronics by P. P. Jain. 2. Digital Electronics by M. R. Yadav.	Digital Systems Principles & applications by Ronald Tocci. Need S. Widmer and Gregory L. Moss.	
02.	14 (9 to 22)	Logic gates & Boolean algebra	Logical symbols, Boolean expression & Truth Table of NOT gate, AND gate, OR gate, NAND gate, NOR gate, Ex-OR gate, Ex-NOR gate. Concept of universal gate (NAND & NOR).	1. Digital Electronics by P. P. Jain. 2. Digital Electronics by M. R. Yadav.	1. NPTEL video course on digital electronics. 2. Digital Design by Mano.	

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(2/9)

Sr. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
			Boolean Laws - Commutative Law, Associative Law, Distributive Law, AND Law, OR Law, Inversion Law, Principle of Duality. Boolean Theorems - Duality Theorem, De-Morgan's Law. SOP & POS representations for logical expressions. K-map simplifications - 2, 3 & 4 variables.	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
		✓ ✓			

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Date 03/08/2026	Principal Sign 

* Use additional sheets (if required).

PLANNED SYLLABUS COVERAGE (Theory)

GP Kangra		Department: Instru. Engg. Subject		Digital Logic Design	
SYLLABUS COVERAGE		Course IEPC 207 (Program)		Duration 01.08 to 28.08	
Sr. No.		Period Nos.		Theory	
03		10 (23 to 32)		56 (6:42) Practical	
04		14 (33 to 46)		42 (4:42) Practical	
05		08 (47-54)		08 (4:42) Practical	
Topic		Details		Instruction Reference	
Remarks		Additional Study Recommended		Remarks	
Combinational Logic Circuits		Introduction to Combinational circuits, half-adder & full adder, half subtractor & full subtractor, Multiplexer - 2:1, 4:1, 8:1, De-multiplexer - 1:2, 1:4, 1:8, Encoders & Decoders		NPTL video course on Digital electronics circuit.	
Sequential Logic Circuits		Introduction to sequential circuits, Concepts of latch & 1-bit memory cell, Concept of Triggering Flip-flops - SR, JK, T & D flip-flop. Shift registers - SISO, SIPO, PISO, PIPQ. Counters - 3 bit synchronous & asynchronous (Up/Down Counter)		Need 2. Widmer & G.L. Moss. Digital Systems by Ronald Tocci. Digital Systems by Tocci.	
Analog - Digital		Concept of Analog to digital conversion		1. NPTL video course on Digital electronics circuit. 2. Digital Principles & Applications by Leach, Malvino & Saha.	

Sr. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
		Conversion	Sampling, quantization & encoding. Analog to digital conversion/converters - Successive approximation & Dual slope integrator ADC. Basics of digital to analog conversion. D/A Converter - Binary, Weighted Register, DAC & R-2R Ladder DAC	Unit 8 selected Data sheet of dec-10.	NPTFL wider course on digital electronic circuit	
06	02	-	Revision			

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

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Date 03/08/2026	HOD Sign 
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Sr. No.	Details of Practical		Likely Turn/Date	Actual Date	Responsibility	HOD Sign.	Remarks
	Equipment	STD Ref. Write up					
01	Verification of truth table of various logic gates (NOT, AND, OR, NAND, NOR, Ex-OR, Ex-NOR)	Textbook	Q1: 1 st , 2 nd , 6 th , 8 th Q2: 1 st , 2 nd , 5 th , 8 th	Q1: 6/18/26 Q2: 5/18/26	Y		
02	Verification of De-Morgan's theorem.	do -	Textbook	Q1: 3 rd , 4 th Q2: 3 rd , 4 th			
03	To design & implement half & full adder circuit	do -	Textbook & manual	Q1: 5 th Q2: 5 th			
04	To design & implement full adder circuit.	do -	do -	Q1: 6 th Q2: 6 th			

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 03/08/26

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 03/08/26

Practical Planning & Coverage Statement

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					
05	To design & implement any multiplexer (i.e., 1:n)	MUX-DE MUX exp -experimental kit	Textbook & Manual	G1: 7th G2: 7th				
06	To design & implement any de-multiplexer (i.e., n:1)	-do-	-do-	G1: 8th G2: 8th				
07	To design & implement R-S or J-K flip flop	Flip-flop experim -ent kit	-do-	G1: 9th, 10th G2: 9th, 10th				
08	To design and implement a 3-bit up/down counter	Counter experim -ental kit.	-do-	G1: 11th G2: 11th				
09	Revision	—	—	G1: 12th, 13th, 14th G2: 12th, 13th, 14th				

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PLANNED SYLLABUS COVERAGE(Theory)

G Kagra		Department: <u>Instrumentation</u> Subject <u>Electronic Circuits</u>				
		Course <u>Program Core</u>		Duration <u>01.08.2026 to 28.11.2026</u>		
SYLLABUS COVERAGE		Total Periods <u>56 Theory</u> Theory <u>14 weeks X 04 = 56</u>				
Sr. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
01	09 (01-09)	Basic fundamentals	Basic concept of Semi Conductor, Properties & Energy band description of Semiconductors, Concept of Intrinsic Extrinsic Semiconductor, Basic Concept of P-N Junction	Integrated Electronics: Jacob Millman and Christos C. Halkias (TMH)	Basic Electrical and Electronic Engg. SK Bhattacharya (Pearson)	
02	09 (10-18)	Semiconductor Diode	Semiconductor diode - its Symbol, forward & Reverse biasing and V-I characteristics Application of Semiconductor Diode as HW/FW/Bridge rectifier, Zener diode, App ⁿ of Zener diode as voltage stabilizer	do	do	
03	15 (19-33)	Bipolar Junction Transistor (BJT)	Basic concept of BJT, Symbol NPN/PNP Config. their working, Basics of Transistor biasing, Basic application of transistor - Transistor as a switch, Transistor connections - CB - CE, CC Configuration	do	do	
04	09 (34-42)	Transistor Amplifiers	Basic application of BJT as an Amplifier, classification of Amplifiers, basic Concept of Multi stage transistor Amplifier, Basic Concept of feedback in Amplifiers	do	do	

To be: moved from concerned HOD within seven days

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Sr. No.	Period Nos.	Topic	Details	Instruction Reference	Additional Study Recommended	Remarks
05	08 (43-50)	Field effect transistor (FET)	Basics of FET- Principle and working of JFET, Basic Concept of MOSFET, Comparison of BJT/FET/ MOSFET, Salient features of CMOS	do	do	
06	06 (51-56)	Class tests/ House test/ Revision	class test : 01 class test : 02 House test Extra tests Revision.			

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

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Date 03/8/16	Principal Sign 

Practical Planning & Coverage

Department: Instrumentation Engineering
 Course: Program core
 Laboratory: Measurement Lab.
 Subject : Electronic circuit.

Sr.N	Details of Practical	Availability of Equipment Set up	STD Ref. Write up	Likely Turn/Date	Actual Date	Responsibility	HOD Sign.	Remarks
0.								
1.	To Identify the terminals of diode, Transistor and test PN junction Diode, Zener, BJT.	PN Diode Zener BJT. Multimeter	Internet & Book.	Every Friday GI				
2.	To Plot the VI characteristics of PN junction Diode	Diode VI charact. test.	Manual	Every Saturday GII				
3.	To plot the VI character. of Zener Diode	—do—	—do—					
4.	To observe the use of Zener diode as volt. Reg.	—do—	—do—	(11:25 to 01:25 PM)				
5.	To plot I/O characteristics of BJT in CB Config.	BJT Charact. kit	—do—					
6.	To plot I/O character. of BJT in CE Config.	—do—	—do—					
7.	To plot I/O character. of BJT in CC Config.	—do—	—do—					

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