

## LESSON PLAN

Name of Faculty : Rakesh Malik

Discipline : I & C deptt.

Semester : 3rd

Subject : Basics of Control System

Work Load : 03 Hrs. Per week

Week	Lecture	Topic (Including assignments/tests)
1	1	Basic elements of control system
	2	Open loop control system
	3	closed loop control system
	4	control system terminology
2	5	Manually controlled closed loop systems
	6	Automatic controlled closed loop systems
	7	Basic elements of servo mechanism
	8	Examples of automatic control system
3	9	Use of equivalent system for system analysis
	10	Liner systems
	11	Non-Linera systems
	12	Control system examples from Chemical systems
4	13	Mechanical systems
	14	Electrical systems
	15	Laplace transform (Introduction)
	16	Transfer function analysis of ac servomotors
5	17	Transfer function analysis of dc servomotors
	18	Transfer function analysis of ac synchros
	19	Transfer function analysis of dc synchros
	20	Transfer function analysis of ac stepper motor
6	21	Transfer function analysis of dc stepper motor
	22	Transfer function analysis of ac amplydyne
	23	Transfer function analysis of dc amplydyne
	24	Transfer function analysis ac position control
7	25	Magnetic amplifier
	26	Transfer function
	27	Block diagram
	28	Reduction of block diagram
8	29	Problem in block diagram
	30	Mason's formula
	31	Signal flow graph
	32	Signal flow graph
9	33	Standard test signals
	34	Time response of first order system
	35	Time response of second order system
	36	Time constant
10	37	Time response of second order system
	38	Time response specification

10	39	Steady state errors
	40	Errors constant
11	41	Problems in first order system
	42	Problems in first order system
	43	Problems in second order system
12	44	Problems in second order system
	45	Routh hurwitz criterion
	46	Routh hurwitz criterion
13	47	Routh hurwitz criterion
	48	Routh hurwitz criterion
	49	Root locus
	50	Root locus
14	51	Root locus
	52	Root locus
	53	Bode plotting using semilog graph paper
	54	Bode plotting using semilog graph paper
15	55	Bode plotting using semilog graph paper
	56	Bode plotting using semilog graph paper
	57	Bode plotting using semilog graph paper
	58	Bode plotting using semilog graph paper
15	59	Bode plotting using semilog graph paper
	60	Bode plotting using semilog graph paper

## LESSON PLAN

Name of Faculty : Pardeep Nandal

Discipline : I & C

Semester : 3rd

Subject : Electrical and electronics materials and components

Work Load : Lecture-04

Lesson Plan Duration- 15 weeks ( July 2018 to Nov. 2018)

Week	Day	Theory
1	1	Introduction
	2	Introduction of subject
	3	Classification of materials conducting
	4	Semi conducting
2	5	Insulating materials
	6	Their atomic structure and energy bands
	7	Conducting materials resistors
	8	Factor affecting resistivity such as temp, alloying & mechanical stressing
3	9	Classification of conducting materials
	10	low resistivity
	11	High resistivity materials
	12	Application of copper
4	13	Aluminium, steel low resistivity
	14	Copper alloys such as brass, bronze, copper, graphite
	15	Super conductivity
	16	Piezoelectric e ceramic materials
5	17	Insulating materials
	18	Application of the following materials mica, glass, copper
	19	Silver, PVC, silicon
	20	Rubber, bakelite, cotton, ceramic
6	21	Polyster, polythene and varnish
	22	Magnetic materials
	23	Different magnetic materials dia, para, ferro and their properties
	24	Ferro magnetism, domains
7	25	Permeability, Hysteresis loop
	26	soft and hard magnetic materials
	27	Special materials
	28	Thermocouple
8	29	Bimfals, lead soldering
	30	Fuse material, mention their application
	31	Introduction of various engineering materials necessary of fabrication of electrical machine such as motors
	32	Generators, transformers etc
9	33	Concept of capacitance and capacitors
	34	capacity of parallel plate capacitor, spherical capacitor, cylindrical
	35	Energy stored in a capacitor
	36	Concept of di-electric
10	37	Series and parallel combination of capacitor
	38	Charging and discharging of capacitor
	39	Resistors carbon film
	40	Metal film, carbon composition, wound and variable type
11	41	Transformer, inductors
	42	RF coils
	43	Method of manufacture, testing
	44	Need of shielding
12	45	Surface mounted devices
	46	construction detail
	47	Specification
	48	Connectors, Relays
	49	Switched and cables

13	50	Different types of connectors, delays
	51	Switches and cable stheir symbols
	52	IC's Characteristics and testing
14	53	Basic characteristics of semi-conducting materials
	54	Testing of diodes, transistors
	55	EFET's and SCRs
	56	Various process in IC manufacturing
15	53	Hybrid IC technology
	54	Revision
	55	Revision
	56	Revision

### Lesson Plan

**Name of the Faculty** : Rakesh Malik

**Discipline** Instrumentation and Control

**Semester** 3rd

**Subject** Fundamental of Digital Electronics

**Lesson Plan Duration** 15 weeks

**Work Load (Lecture/Practical) per week (in hours)** : Lectures- 03, Practical- 03

Week		Theory		Practicals
	Lecture Day	Topic (Including assignment/test)	Practical week	Topic
1st	1	Distinction between analog and digital signal Applications and advantages of digital signal	1	Basic logic operations AND, OR, NOT functions
	2	Binary, octal and hexadecimal number system conversion from decimal and hexadecimal to binary & viceversa		
	3	Binary addition, Substraction, Multiplication and division including binary points		
2nd	4	1's and 2's complement method of addition/ subtraction, sign magnitude method of representation, floating point representation	2	Verification and interpretation of truth tables for AND, OR, NOT, NAND, NOR, EXOR, EXNOR Gates
	5	Concept of code, weighted and non-weighted codes example of 8421, BCD, Excess- 3 and Gray code.		
	6	Concept of parity, single and double parity and error detection		
3rd	7	Alphanumeric codes ASCII and EBCDIC	3	Realisation of logic functions with the help of NAND or NOR gates. Design of NOR gate latch and verification of its operation
	8	Concept of negative and positive logic. Definition, symbols and truth tables of NOT, AND, OR, NAND, NOR, EXOR Gates NAND and NOR as Universal gates		
	9	Definition of SSI, MSI, LSI, VLSI TTL and CMOS families and their sub classification.		
4th	10	Characteristics of TTL and CMOS digital gates	4	To design half adder using XOR and NAND gates and verify its operation.
	11	Delay, Speed, Noise Margin, Logic levels, Power dissipation fan in, power supply requirement		
	12	Comparison between TTL and CMOS families		
5th	13	Postulates of Boolean algebra, De Morgan's Theorems various identities	5	4 bit adder, 2's complement subtractor CKT using 4 bit adder IC and an XOR IC and verify the operation of circuit.
	14	Formulation of truth table and Boolean equation for simple problem. Implementation of Boolean (logic) equation with gates.		
	15	Karnaugh map (upto 4 variables)		
6th	16	Simple application in developing combinational logic circuits.	6	To design a NOR Gate latch and verification of its operation.
	17	Half adder and full adder circuit, design and implementation.		
	18	Half and full subtractor circuit, design and implementation		
7th	19	4 bit adder/subtractor	7	Verification of truth table for positive edge triggered negative edge triggered, level triggered IC flip
	20	Adder and Subtractor IC 7484		
	21	Four bit decoder CKTS for 7 segment display and decoder		
8th	22	Multiplexers and De- Multiplexers	8	Verification of truth table for encoder and decoder ICs, MUX and DEMUX.
	23	Basic functions and block diagram of MUX and DEMUX		
	24	Different types and ICs		

9th	25	Concept and types of latch with their working and application	9	To design a 4 bit SISO, SIPO, PISO, PIPO shift registers using JK/D FF and verification of their operation.
	26	Operation using wave forms and truth tables of RS, T, D flip flops		
	27	Master (Slave) JK flip flops		
10th	28	Difference between latch and flip flop.	10	To design 4 bit ring counter and verify its operation
	29	Flip Flop ICS		
	30	Introduction to Asynchronous and Synchronous Counters		
11th	31	Binary counters, Divide by N ripple counter, Decade counter	11	Verification of truth table for any one universal shift register IC. Use of IC 7490 or equivalent TTL as divide by 2 by Divide by 10 counter. Use of IC 7493 or equivalent TTL <b>a)</b> divide by 2 <b>b)</b> divide by 8 <b>c)</b> divide by 16 counter
	32	Pre settable and programmable counters		
	33	Up/Down Counter		
12th	34	Ring counter with timing diagram	12	Revision and Practice
	35	Counter ICS		
	36	Introduction and basic concept including shift left and shift right		
13th	37	SIPO, SISO, PISO, PIPO	13	Revision and Practice
	38	Universal shift register		
	39	Buffer register, Tristate buffer register		
14th	40	IC 7495	14	Revision and Practice
	41	Working Principle of A/D, D/A converters		
	42	Stair Step Ramp A/D converter, Dual slope A/D converter		
15th	43	Successive approximation A/D converter	15	Revision and Practice
	44	Binary weighted D/A converter, R/2R ladder D/A converter		
	45	Performance characteristics, applications of A/D, D/A converter		

## LESSON PLAN

**Name of the Faculty** : **JAI PARKASH**  
**Discipline** : **INSTRUMENTATION AND CONTROL**  
**Semester** : **3<sup>rd</sup>**  
**Subject** : **ELECTRICAL MACHINES**  
**Lesson Plan Duration** : **15 weeks (from July 2018 to November 2018)**

**Work Load (Lecture/ Practical) per week (in hours): Lectures-03, Practicals-03**

Week	Theory		Practical	
	Lecture Day	Topics (including Assignments/Tests)	Practical Day	Topic
1 <sup>st</sup>	1 <sup>st</sup>	Brief introduction about subject and syllabus	1 <sup>st</sup>	DC machines - Speed control of dc shunt motor (i) Armature control method (ii) Field control method
	2 <sup>nd</sup>	Three Phase Supply Advantages of 3 phase system over single phase system		
	3 <sup>rd</sup>	Star delta connections		
2 <sup>nd</sup>	4 <sup>th</sup>	revised previous topics	2 <sup>nd</sup>	Study of dc series motor with starter (to operate the motor on no load for a moment)
	5 <sup>th</sup>	Relation between phase voltage and line voltage, phase current and line current in a 3 phase system		
	6 <sup>th</sup>	Power and power factor(p.f.) in 3 phase system and their measurements, importance of p.f. (simple problems)		
3 <sup>rd</sup>	7 <sup>th</sup>	Assignments and Class Test 1	3 <sup>rd</sup>	Transformers (single phase) Open circuit and short circuit test for determining parameter of a transformer
	8 <sup>th</sup>	Principle of transformer, construction voltage transformation		
	9 <sup>th</sup>	Principle of transformer, construction current transformation		
4 <sup>th</sup>	10 <sup>th</sup>	Methods of connection in 3 phase transformers, current and voltage relationship	4 <sup>th</sup>	Determining the regulation and efficiency from the data obtained from open circuit and short circuit test
	11 <sup>th</sup>	auto transformer and its uses, instrument transformer		
	12 <sup>th</sup>	voltage regulation and its significance, need for isolation		
5 <sup>th</sup>	13 <sup>th</sup>	electrical and transients suppression	5 <sup>th</sup>	Three-phase transformers Checking the polarity of the windings of a three phase transformer and connecting the windings in various configurations
	14 <sup>th</sup>	principles of isolation transformer		
	15 <sup>th</sup>	specifications of all types of transformers. Losses in a transformer		

6 <sup>th</sup>	16 <sup>th</sup>	Assignments and Class Test 2	6 <sup>th</sup>	viva voice of previous practicals done so far
	17 <sup>th</sup>	DC Motor Principle, significance of back emf		
	18 <sup>th</sup>	types of motors and their construction		
7 <sup>th</sup>	19 <sup>th</sup>	motor characteristics for shunt	7 <sup>th</sup>	All files are checked
	20 <sup>th</sup>	motor characteristics for series		
	21 <sup>st</sup>	speed control of DC motors and factors controlling the speed		
8 <sup>th</sup>	22 <sup>nd</sup>	Starting methods, construction and working of 3 point starter, applications	8 <sup>th</sup>	To measure power and power factors in 3 - phase load using two wattmeter method.
	23 <sup>rd</sup>			
	24 <sup>th</sup>	Assignments and Class Test 3		
9 <sup>th</sup>	25 <sup>th</sup>	Three Phase Induction Motors Principle, construction	9 <sup>th</sup>	To connect a dc shunt motor with supply through 3 - phase starter and to run the motor at different speed with the help of a field regulator
	26 <sup>th</sup>	concept of slip, torque and characteristics, effect of motor resistance on torque (running and starting)		
	27 <sup>th</sup>	rotor current, output power, different methods of speed control. Starting methods		
10 <sup>th</sup>	28 <sup>th</sup>	constructional and working of 3 point starter, applications (simple problems)	10 <sup>th</sup>	To run a 3 - phase squirrel cage Induction motor with the help of a star delta starter
	29 <sup>th</sup>			
	30 <sup>th</sup>	Assignments and Class Test 4		
11 <sup>th</sup>	31 <sup>st</sup>	Synchronous Motors Principle, construction and working	11 <sup>th</sup>	practicals revisions
	32 <sup>nd</sup>	effect of load and excitation on synchronous motor		
	33 <sup>rd</sup>	Starting of motor and their applications		
12 <sup>th</sup>	34 <sup>th</sup>	Single Phase Motors Principle, construction, working speed	12 <sup>th</sup>	All files are checked
	35 <sup>th</sup>	Assignments and Class Test 5		
	36 <sup>th</sup>	Single Phase Motors Principle, construction of Induction motor		
13 <sup>th</sup>	37 <sup>th</sup>	starting and applications of the Induction motor	13 <sup>th</sup>	To change the direction of rotation of induction motor.
	38 <sup>th</sup>	Single Phase Motors Principle, construction of Universal motor		
	39 <sup>th</sup>	starting and applications of the Universal motor		
14 <sup>th</sup>	40 <sup>th</sup>	Assignments and Class Test 6	14 <sup>th</sup>	To run a synchronous motor with a.c. supply and to measure speed to verify the relation $N = 120f/P$
	41 <sup>st</sup>	Stepper Motor Types, construction, working and their applications		
	42 <sup>nd</sup>	Servo Motor Types, construction, working and their applications		
15 <sup>th</sup>	43 <sup>rd</sup>	Assignments and Class Test 7	15 <sup>th</sup>	Practical viva
	44 <sup>th</sup>	Revision/Test		
	45 <sup>th</sup>	Revision/Test		



### Lesson Plan

**Name of the Faculty** : Rakesh Malik

**Discipline** Instrumentation and Control

**Semester** 3rd

**Subject** Fundamental of Digital Electronics

**Lesson Plan Duration** 15 weeks

**Work Load (Lecture/Practical) per week (in hours)** : Lectures- 03, Practical- 03

Week		Theory		Practicals
	Lecture Day	Topic (Including assignment/test)	Practical week	Topic
1st	1	Distinction between analog and digital signal Applications and advantages of digital signal	1	Basic logic operations AND, OR, NOT functions
	2	Binary, octal and hexadecimal number system conversion from decimal and hexadecimal to binary & viceversa		
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2nd	4	1'S and 2'S complement method of addition/ subtraction, sign magnitude method of representation, floating point representation	2	Verification and interpretation of truth tables for AND, OR, NOT, NAND, NOR, EXOR, EXNOR Gates
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	9	Defination of SSI, MSI, LSI, VLSI TTL and CMOS families and their sub classification.		
4th	10	Characteristics of TTL and CMOS digital gates	4	To design half adder using XOR and NAND gates and verify its operation.
	11	Delay, Speed, Noise Margin, Logic levels, Power dissipation fan in, power supply requirement		
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6th	16	Simple application in developing combinational logic circuits.	6	To design a NOR Gate latch and verification of its operation.
	17	Half adder and full adder circuit, design and implementation.		
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14th	40	IC 7495	14	Revision and Practice
	41	Working Principle of A/D, D/A converters		
	42	Stair Step Ramp A/D converter, Dual slope A/D converter		
15th	43	Successive approximation A/D converter	15	Revision and Practice
	44	Binary weighted D/A converter, R/2R ladder D/A converter		
	45	Performance characteristics, applications of A/D, D/A converter		

## LESSON PLAN

**\*Name of the Faculty** : Mr. VIRENDER KUMAR  
**Discipline** : INSTRUMENTATION AND CONTROL  
**Semester** : THIRD  
**Subject** : PRINCIPLES OF INSTRUMENTATION  
**Lesson Plan Duration** : 15 weeks (from July, 2018 to November, 2018)

**\*\*Work Load (Lecture/ Practical) per week (in hours): Lectures-03, Practicals-03**

Week	Theory		Practical	
	Lecture Day	Topics (including Assignments/Tests)	Practical Day	Topic
1 <sup>st</sup>	1 <sup>st</sup>	<b>Basics of Instrumentation Systems</b> - Scope of instruments	1 <sup>st</sup>	To find the constant of 1st order instrument
	2 <sup>nd</sup>	- Necessity of instruments		
	3 <sup>rd</sup>	- Measurement		
2 <sup>nd</sup>	4 <sup>th</sup>	Significance of Measurement and its types	2 <sup>nd</sup>	To find the constant of 2nd order instrument
	5 <sup>th</sup>	- Building blocks of instrumentation systems		
	6 <sup>th</sup>	- Various testing signals		
3 <sup>rd</sup>	7 <sup>th</sup>	- Important process variables	3 <sup>rd</sup>	To find the response of 1st order instrument with step, sinusoidal and ramp input
	8 <sup>th</sup>	- Units of Variables		
	9 <sup>th</sup>	<b>Performance Characteristics of Instruments</b> - Static characteristics of instruments - Accuracy, precision, linearity, resolution, sensitivity,		
4 <sup>th</sup>	10 <sup>th</sup>	hysteresis, drift, dead time, loading effects.	4 <sup>th</sup>	Practical viva
	11 <sup>th</sup>	- Dynamic inputs and dynamic characteristics time constant, response time		
	12 <sup>th</sup>	natural frequency		
5 <sup>th</sup>	13 <sup>th</sup>	damping coefficient	5 <sup>th</sup>	To find the response of 2nd order instrument with step, sinusoidal and ramp input
	14 <sup>th</sup>	Reliability, serviceability		
	15 <sup>th</sup>	cost effectiveness, and availability		
6 <sup>th</sup>	16 <sup>th</sup>	Sessional test and assignment	6 <sup>th</sup>	To assemble seven segment display using LEDs
	17 <sup>th</sup>	Static Response		
	18 <sup>th</sup>	dynamic response (step response)		

7 <sup>th</sup>	19 <sup>th</sup>	Order of Instruments	7 <sup>th</sup>	To make fourteen segments display using LCD and verify it
	20 <sup>th</sup>	Environmental Effects		
	21 <sup>st</sup>	Environmental Effects		
8 <sup>th</sup>	22 <sup>nd</sup>	Display and recording devices	8 <sup>th</sup>	Practical viva
	23 <sup>rd</sup>	Operating mechanism in indicating and recording devices		
	24 <sup>th</sup>	Various indicating methods		
9 <sup>th</sup>	25 <sup>th</sup>	Integrating methods	9 <sup>th</sup>	To make fourteen segments display using LCD and verify it
	26 <sup>th</sup>	recording methods		
	27 <sup>th</sup>	Combination of various methods		
10 <sup>th</sup>	28 <sup>th</sup>	Merits and demerits of circular chart Recorder	10 <sup>th</sup>	To make the DOT Matrix display and its verification
	29 <sup>th</sup>	Merits and demerits of strip chart Recorder		
	30 <sup>th</sup>	Revisions		
11 <sup>th</sup>	31 <sup>st</sup>	Sessional test and assignment	11 <sup>th</sup>	To make the DOT Matrix display and its verification
	32 <sup>nd</sup>	Basics of printing devices		
	33 <sup>rd</sup>	Scanning		
12 <sup>th</sup>	34 <sup>th</sup>	data logging and field buses	12 <sup>th</sup>	Make any word using LCD and LED
	35 <sup>th</sup>	Bar graph LCD		
	36 <sup>th</sup>	Seven segment display		
13 <sup>th</sup>	37 <sup>th</sup>	X-Y recorder	13 <sup>th</sup>	Make any word using LCD and LED
	38 <sup>th</sup>	Scanners		
	39 <sup>th</sup>	Design experiments for display system		
14 <sup>th</sup>	40 <sup>th</sup>	Errors	14 <sup>th</sup>	To study circular and strip chart recorder
	41 <sup>st</sup>	Calibration of instruments		
	42 <sup>nd</sup>	Sources of errors		
15 <sup>th</sup>	43 <sup>rd</sup>	Classification of errors	15 <sup>th</sup>	Practical viva
	44 <sup>th</sup>	Grounding/earthing Precautions		
	45 <sup>th</sup>	Sessional Test and assignment		

## LESSON PLAN

Name of Faculty : Mr. Virender Sandhu & SH. RAKESH MALIK

Discipline : Instrumentation & Control Engg.

Semester : 3rd

Subject : SOFT SKILL / SCA

Work Load : 05 Practical

Lesson Plan Duration :15 weeks(from July,2018 to November,2018)

Week	Practical Day	Theory
		Topic
1	1	INTRODUCTION ABOUT SOFT SKILLS
	2	WHAT IS ART OF LISTENING
	3	INTRODUCTION ABOUT LISTENING TWO EAR AND MOUTH
	4	TYPES OF LISTENING
	5	BENEFOR OF LISTEING
2	6	FACTORS ABOUT RELATED TO LISTENING
	7	FACTORS THAT HAMPER LISTENING
	8	COMMON POOR LISTENING HABITS
	9	ADVANTAGE OF LISTENING
	10	LISTENING TIPS
3	11	INTRODUCTION ABOUT READING
	12	COGNITIVE PROCESS OF READING
	13	DISCUSSION ABOUT GOOD READERS
	14	BENEFITS OF READING
	15	DIFFERENT TYPES OF READING
4	16	TIPS FOR EFFECTIVE READING
	17	DIFFERENT STAGE OF READING
	18	DETERMINE STUDENT READING RATE
	19	ADJUSTING READING RATE
	20	ACTIVITIES FOR INCREASING READING RATE
5	21	PROBLEM WITH READING
	22	BECOMING AN EFFICIENT READER
	23	INTROCUTION ABOUT SPEAKING
	24	WHAT MAKES COMMUNATION IMPORTANT
	25	DEFINE COMMUNICATION
6	26	FEATURES OF COMMUNICATION
	27	COMMUNICATION PROCESS
	28	CHANNELS OF COMMUNCATION
	29	FORMAL AND INFORMAL COMMUNICATION N/W
	30	IMPORTANCE OF COMMUNICATION
7	31	BURRES OF COMMUNICAITON
	32	TIPS OF EFFECTIVE COMMUNICATION
	33	CONVERSATION TIPS
	34	WHAT IS PRESENTATION
	35	TIPS FOR POWERFUL PRESENTATION
8	36	ART OF PUBLIC SPEAKING
	37	IMPORTANCE OF PUBLIC SPEAKING
	38	BENEFIT OF PUBLIC SPEAKING
	39	PUBLIC SPEAKING TIPS
	40	OVER COMING FEARS FOR PUBLIC SPEAKING
9	41	INTRODUCTION ABOUT WRITING
	42	IMPORTANCE ABOUT WRITING
	43	FEATURES OF WRITING

	44	BENEFITS OF WRITING
	45	CREATIVE WRITING TIPS
10	46	DRAWBACK OF WRITTEN COMMUNICATION
	47	INTRODUCTION ABOUT EMAIL
	48	INTRODUCTION ABOUT MAIL MAGIC
	49	USE OF APPROPRIATE SALUTATION
	50	MAKE THE SUBJECT MATTER SIGNIFICENT
11	51	KEEP A DICTIONERY CLOSE BY
	52	USE COMMAS WHEN IN DOUBT
	53	USE SMILEY WHEN IN DOUBT
	54	PREFACE INCLUDING PREVIOUS MESSGAGE
	55	SHORTEN THE FILE ATTACHMENT
12	56	RESEND BEFORE PRESSING THE SEND BUTTON
	57	BE POLITE AND REPLICATE GOOD DEEDS
	58	ANTICIPATE EMPATHIZE
	59	UNDERSTANT WHAT NETTQUELTE
	60	INTROCUTION ABOUT
13	61	DISCUSSION ABOUT TOPICS REALTED TO Gender
	62	DISCUSSION ABOUT PROVISION OF PUNISHMENT
	63	PUT PUNISHMENT AGAINT VIOLATION
	64	ILLEGAL FLESH TRADE
	65	REOBLIZATION OF VICTIM
14	66	RAPE WILL ACT MAKE TO HELP VICTIM
	67	DISCUSSION ABOUT GENERAL TOPICS
	68	TEST
	69	ASSIGNMENT
	70	REVISION
15	71	REVISION / DISCUSSION
	72	COPY CHECKING
	73	REVISION / DISCUSSION
	74	COPY CHECKING
	75	DISCUSSION

## LESSON PLAN

**Name of the Faculty** : JAI PARKASH  
**Discipline** : INSTRUMENTATION AND CONTROL  
**Semester** : 3<sup>rd</sup>  
**Subject** : TEST AND MEASURING INSTRUMENTS  
**Lesson Plan Duration** : 15 weeks (from July 2018 to November 2018)

**Work Load (Lecture/ Practical) per week (in hours): Lectures-03, Practicals-03**

Week	Theory		Practical	
	Lecture Day	Topics (including Assignments/Tests)	Practical Day	Topic
1 <sup>st</sup>	1 <sup>st</sup>	<b>Introduction to Test and Measurements</b> - Classification, Absolute and secondary instruments	1 <sup>st</sup>	To identify and study of indicating, integrating and recording instruments
	2 <sup>nd</sup>	- Indicating recording and integrating Instruments		
	3 <sup>rd</sup>	- Review of units, dimensions and standards		
2 <sup>nd</sup>	4 <sup>th</sup>	Symbolic representation of circuits Measurement	2 <sup>nd</sup>	Extension of range of a given voltmeter and an ammeter
	5 <sup>th</sup>	<b>Measurement of Resistance, Inductance and Capacitance</b> -Measurement of resistance		
	6 <sup>th</sup>	- Measurement of Ohmmeters		
3 <sup>rd</sup>	7 <sup>th</sup>	- Meggers	3 <sup>rd</sup>	Use of analog and digital multimeter for measurement of voltage, current (a.c/d.c) and resistance
	8 <sup>th</sup>	- Wheatstone Bridge, Kelvin Bridge		
	9 <sup>th</sup>	- Potentiometer method, Impedance Measurement		
4 <sup>th</sup>	10 <sup>th</sup>	Assignments and Class Test 1,2	4 <sup>th</sup>	Study the constructional details, working and calibration of an ammeter (moving coil and moving iron type)
	11 <sup>th</sup>	Measurement of inductance and capacitance		
	12 <sup>th</sup>	AC bridge method, Wagner earth devices		
5 <sup>th</sup>	13 <sup>th</sup>	Detectors – classification and types	5 <sup>th</sup>	To measure power, power factor in a 1-phase circuit, using wattmeter and power factor meter and verify results with calculations
	14 <sup>th</sup>	Vibration galvanometers		
	15 <sup>th</sup>	<b>Ammeter, Voltmeter and Multimeter</b> -Zero error Moving Iron, Permanent Magnet Moving Coil Meters		

6 <sup>th</sup>	16 <sup>th</sup>	-Range Extension, Thermal type electrostatic inductor, rectifier instruments	6 <sup>th</sup>	Study the constructional details, working of a meggar and measurement of insulation resistance of a given motor
	17 <sup>th</sup>	-Electronic voltmeter, Digital Voltmeter (DVM)- ramp type and integrating type digital voltmeters		
	18 <sup>th</sup>	-D' Arsonval Galvanometer, dynamo galvanometer equation of motion		
7 <sup>th</sup>	19 <sup>th</sup>	-damped, under damped and critical damped	7 <sup>th</sup>	To measure the value of earth resistance using earth tester
	20 <sup>th</sup>	<b>Multimeter:</b> Principle of measurement, Measurement of d.c voltage		
	21 <sup>st</sup>	- a.c voltage, a.c and d.c sensitivity, Shunt and multiplier for range extension		
8 <sup>th</sup>	22 <sup>nd</sup>	Assignments and Class Test Unit 3	8 <sup>th</sup>	To measure unknown resistance with wheat-stone bridge
	23 <sup>rd</sup>	<b>Power and Energy Measurements</b> -Watt meters – types, definition, classification		
	24 <sup>th</sup>	-2 Wattmeter and 3 Wattmeter methods		
9 <sup>th</sup>	25 <sup>th</sup>	-Energy Measurement	9 <sup>th</sup>	To measure frequency, power, power factor in a single-phase circuit, using digital frequency meter, wattmeter and power factor meter and to verify results with calculations
	26 <sup>th</sup>	-Energy meters – types, definition, principle, Maximum demand indicators		
	27 <sup>th</sup>	<b>Frequency and Phase difference Measurement</b> -Stroboscopes, synchro-scopes		
10 <sup>th</sup>	28 <sup>th</sup>	-Power factor meters, Digital frequency meters	10 <sup>th</sup>	Measurement of power and power factor of a three-phase balanced load by two wattmeter method
	29 <sup>th</sup>	-phase sequence indicators		
	30 <sup>th</sup>	Assignments and Class Test Unit 4,5		
11 <sup>th</sup>	31 <sup>st</sup>	<b>Illumination Instrument</b> -Definition, Flicker	11 <sup>th</sup>	Use of LCR meter for measuring inductance, capacitance, Q-factor and resistance
	32 <sup>nd</sup>	- illumination photo meter		
	33 <sup>rd</sup>	<b>Cathode ray Oscilloscope</b> -Block diagram, Construction of Circuit, Deflection sensitivity		
12 <sup>th</sup>	34 <sup>th</sup>	-Various controls, X–Y Section, delay line, Horizontal sweep section	12 <sup>th</sup>	Measurement of voltage, frequency, time period, phase and rise time and fall time using CRO
	35 <sup>th</sup>	-synchronization of sweep and triggered sweep		



	36 <sup>th</sup>	-Measurement of voltage, current, phase angle, frequency, CRO probes		
13 <sup>th</sup>	37 <sup>th</sup>	-dual trace beam, high frequency beam	13 <sup>th</sup>	Measurement of voltage, frequency, time and phase using Digital Storage Oscilloscope(DSO)
	38 <sup>th</sup>	-Digital Storage Oscilloscope (DSO)		
	39 <sup>th</sup>	<b>Construction, principle and operation of the following Meters and Instruments</b> -Q-meter		
14 <sup>th</sup>	40 <sup>th</sup>	-transistor tester	14 <sup>th</sup>	Measurement of illumination at different places using a photometer
	41 <sup>st</sup>	-LCR Bridge, function generator		
	42 <sup>nd</sup>	-Tong tester, flux meter		
15 <sup>th</sup>	43 <sup>rd</sup>	-spectrum analyzer	15 <sup>th</sup>	Practical viva
	44 <sup>th</sup>	Assignments and Class Test unit 7,8		
	45 <sup>th</sup>	Revision		