

Lesson Plan

Name of Institute	: Ambala College of Engineering and Applied Research
Name of the Faculty member	: Ashok Kumar
Discipline	: Mechanical Engineering
Semester	: 4 th
Subject	: Instrumentation & Control (MEC-208N)
Lesson Plan Duration	: 15 weeks (from January 2020 to April 2020)
Work Load	: L: 3 T: 0 P: 0

1 st	1	introduction of Instrumentation System
	2	typical applications of instrument systems
	3	functional elements of a measurement system
	4	classification of instruments
2 nd	5	Standards and calibration
	6	static and dynamic characteristics of measurement systems
	7	Statistical Error Analysis
	8	statistical analysis of data and measurement of uncertainty
3 rd	9	probability
	10	confidence interval or leve
	11	mean value and standard deviation calculation
	12	CLASS TEST
4 th	13	standard normal distribution curve
	14	probability tables
	15	sampling and theory based on samples
	16	goodness of fit
5 th	17	curve fitting of experimental data
	18	sampling and theory based on samples
	19	Sensors and Transducers
	20	Sessional Test-1
6 th	21	introduction and classification, transducer selection and specifications
	22	primary sensing elements
	23	resistance transducers,
	24	variable inductance type transducers, capacitive transducers,
7 th	25	piezo-electric transducers,
	26	strain gauges
	27	Smart Sensors
	28	CLASS TEST
8 th	29	architecture of smart sensor
	30	bio sensor and physical sensor,
	31	Piezo-resistive pressure sensor, microelectronic sensor
	32	measurement of torque, shaft power
9 th	33	achometers, seismic and piezo-electric accelerometer.
	34	Liquid column manometers
	35	elastic type pressure gauges, electrical types for pressure and vacuum, temperature measuring instruments

	36	RTD sensors, NTC thermistor, thermocouples
10 th	37	Flow Measurement: drag force flowmeter, turbine flow meter
	38	electronic flow meter, electromagnetic flow meter
	39	Humidity measuring devices,
	40	Sessional Test-2
11 th	42	Density and Specific Gravity, Basic terms, Density measuring devices, Density application considerations,
	42	pH measuring devices, pH application considerations.
	43	Introduction, basic components of control system
	44	classification closed loop and open loop control system
12 th	45	transfer function
	46	block diagram representation of closed loop system and its reduction techniques
	47	mathematical modelling of various mechanical systems and their analogy with electrical systems
	48	various mechanical systems and their analogy with electrical systems
13 th	49	signal flow graph and its representation
	50	analogy with electrical systems
	51	CLASS TEST
	52	Viscosity, Viscosity measuring instruments,
14 th	53	Mechanical Controllers
	54	Basics of actuators
	55	Types Basics of actuators
	56	pneumatic controller
15 th	57	hydraulic controller
	58	Controller and their comparison.
	59	Problems on Mechanical Controllers
	60	Sessional Test-3

(Signature of the teacher concerned with date)