MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(Deemed University)
(Declared Under Distinct Category by Ministry of Education, Government of India)

DEPARTMENT OF ELECTRONICS ENGINEERING

Multiple Mode Teaching Learning Pattern

Name of Course with Code: Instrumentation & Sensors (14241101)			Class: B.Tech. I Year (EC)	Session: 2024-2025
S. No.	**Unit**	**Content to be Covered**	**Teaching Session**	**Mode**
1.	Unit-1	Introduction, Significance of measurement	1	Offline & Open discussions
2.		Block diagram of measurement system, methods of measurements	2	Offline & activity based learning
3.		Elements and their functions of measurement systems, applications	3-4	Offline & Group-Based Learning
4.		Characteristics of measurement systems Static characteristics- accuracy, precision	5-6	Offline & Problem-Solving
5.		sensitivity, reproducibility, drift, static error,dead zone, linearity, resolution, hysteresis, loading effects	7-8	Offline & Problem-Solving
6.		Dynamic characteristics- Speed of response, measuring lag, fidelity, dynamic error, calibration	9-10	Offline & Experiment-Based Learning
7.	Unit-2	Types of Error- Gross, Systematic (Instrumental, Environmental, Observational error), and random error	11-12	Offline & Open Discussions
8.		Statistical treatment of data-measurement tests, histogram	13-14	Offline & Problem-Solving
9.		arithmetic mean, dispersion measurement, range, deviation, average deviation, standard deviation, variance	15-16	Offline & Problem-Solving
10.		Noise, signal to noise ratio	17	Offline & Experiment-Based Learning
11.	Unit-3	Introduction, Sensor Classifications, Sensors Parameters, Selection criterion of Sensors	18	Offline & Open Discussions
12.		General requirements for interfacing, Temperature sensors	19	Offline & Experiment-Based Learning

13.		Thermo resistive sensors- Resistance Temperature Detectors	20-21	Offline & Experiment-Based Learning
14.		Thermistor, Thermoelectric sensors- Thermocouple	22-23	Offline & Open Discussions
15.		Electric Sensors- Capacitive position, proximity	24	Offline & Problem-Solving
16.		displacement sensors, LVDT	25-26	Offline & Problem-Solving
17.	**Unit-4**	Introduction**,** Force sensor, Strain gauge	27	Offline & Open Discussions
18.		Semiconductor strain gauge**,** Strain gauge accelerometers	28-29	Offline & Experiment-Based Learning
19.		Pressure sensors Mechanical pressure sensors	30-31	Offline & Problem
20.		Piezoresistive pressure sensor, Capacitive pressure sensor	32	Offline & Problem
21.	**Unit-5**	Humidity and moisture sensors- Resistive humidity sensor, capacitive moisture sensors	33-34	Offline & Open Discussions
22.		Thermal conduction moisture sensors	35-36	Offline & Experiment-Based Learning
23.		Light dependent resistor (LDR)	37	Offline & Open Discussions
24.		Sensor Interfacing & Applications	38-40	Offline & Open Discussions

Online	Offline						
Online	Black Board Teaching	Group based Learning	Learning through projects	Learning through demonstration	Learning through experimentation	Activity based Learning	Onsite/field based learning
20.93%	69.77%	37.21%	13.95%	27.90%	48.84%	13.95%	09.30%

Dr. Mukesh Kumar Mishra

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DEPARTMENT OF ELECTRONICS ENGINEERING

Multiple Mode Teaching Learning Pattern

Name of Course with Code: Electronics Devices (14241103)		Class: B. Tech. EC I Year (I Sem)	Session: Jul-Dec 2024
S. No.	**Unit**	**Content to be Covered**	**Teaching Session**	**Mode**

S. No.	Unit	Content to be Covered	Teaching Session	Mode
1.	Unit 1	Introduction: Elemental & Compound SemiconductorMaterials	1	Offline & Open discussions
2.		Bonding Forces and Energy Bands in Intrinsic and Extrinsic Silicon	2	Offline & group based problem solving based learning
3.		Charge Carrier in Semiconductors, Carrier Concentration, Extrinsic semiconductor,	3-4	Online & demonstration based learning
4.		Mechanism of Current Flow, Drift Current, Diffusion Current, Hall Effect	5-6	Offline & open discussion
5.		Einstein Relation and Continuity Equation	7-8	Offline & problem solving based learning
8.	Unit 2	P-N Junction properties, Diode Characteristics	9	Offline & problem solving, and experimentation based learning
9.		Equilibrium condition, Biased junction	10	Offline and open discussion, learning through project
10.		Steady state condition	11	Offline & Open discussions
11.		P-N Junction breakdown mechanism	12	Offline & problem solving based learning
12.		Capacitance of junction barrier (Diffusion & transient)	13	Offline & problem solving based learning
13.		Diode circuit parameters	14	Offline & Open discussions
14.		Basic circuits of Rectifier (Half Wave, Full Wave-Center and Bridge)	15	Online & demonstration based learning
15.		Clippers	16	Offline & Onsite/ field visit based Learning, learning through project
16.		Clampers	17	Offline and Learning through experimentation, Learning, learning through project

17.	Unit 3	Basic operation and characteristics of; Zener diode	18	Offline & problem solving based learning
18.		Zener diode as a voltage regulator	19	Offline & problem solving based learning
19.		Tunnel diode, Varactor diode, Schottky diode	20-21	Offline & Open discussions
20.		Light emitting diode, Photo-diode.	22	Offline & Open discussions
21.	Unit 4	Construction, basic operation, current components and equations, CB, CE and CC configuration, input and output characteristics,	23	Online & open discussion
22.		Early effect, Region of operations: active, cut-off and saturation region.	24-27	Online & demonstration based learning, Learning, learning through project
23.		**Field effect transistors;** Construction and characteristics of JFET, working principle of JFET.	28-30	Offline & problem solving based learning
24.		MOSFET construction and characteristics,	31	Online & demonstration based learning, learning through project
25.		MOSFET enhancement and depletion mode.	32	Online & demonstration based learning
26.	Unit 5	**Power Electronics Devices**: Basic principle and working of SCR.	33	Offline & Open discussions
27.		IGBT, Uni-junction Transistor (UJT) and Thyristors.	34-35	Offline & Open discussions
28.		UJT: Principle of operation, characteristics	36	Offline & Open discussions

Online	Offline						
	Black Board Teaching	Group based Learning	Learning through projects	Learning through demonstration	Learning through experimentation	Activity based Learning	Onsite/field based learning
25.4%	64.12%	9.2%	11.0%	21.3%	15.6%	7%	8.44%

Dr. Dablu Kumar

Dr. Hemant Choubey

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR (M.P.)

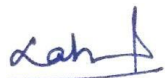A Govt. Added UGC Autonomous and NAAC Accredited Institute, Affiliated to R.G.P.V, Bhopal

DEPARTMENT OF ELECTRONICS ENGINEERING

Multiple Mode Teaching Learning Pattern

Name of Course with Code: Network Theory (14241104)		Class: B. Tech. I Year (EC)		Session: 2024 – 2025	
S. No.	**Unit**	**Content to be Covered**	**Teaching Session**	**Mode**	
1.	Unit 1	Introduction to Circuit Elements	1	Offline & Open discussions	
2.		Characterization of Resistors, Capacitors & Inductors in Terms of their linearity & time dependence features	2	Offline & activity based learning	
3.		Characteristics of Independent & Dependent Sources	3	Offline&Open discussions	
4.		KCL & KVL for circuits with dependent & independent sources	4-5	Offline& Experiment With problem solving ingroup based learning	
5.		Dot convention for coupled inductor and their characteristics	6	Online & demonstration based learning	
6.		co-efficient of coupling	7	Offline & Open discussions	
7.	Unit 2	Superposition theorem	8	Offline & problem solving based learning	
8.		Thevenin Theorem	9	Offline & problem solving based learning	
9.		Norton Theorem	10	Offline & problem solving based learning	
10.		Milliman Theorem	11	Online & demonstration based learning	
11.		Reciprocity Theorem	12	Offline & problem solving based learning	
12.		Maximum power transfer theorem	13,14	Offline & problem solving based learning	
13.		Theorem equivalent circuits based problems	15,16	Offline& Experiment With problem solving ingroup based learning	
14.	Unit 3	The Laplace transform	17	Offline& Onsite/ field visit based Learning	
15.		use of Laplace transform for the solution of integro differential equation	18	Offline& Onsite/ field visit based Learning	
16.		Initial and final value theorem	19	Offline & Open discussions	
17.		Transforms of wave forms synthesized with step, Ramp functions.	20	Online & demonstration based learning	

18.		Transforms of wave forms synthesized with gate and sinusoidal functions.	21-22	Offline& Onsite/ field visit based Learning
19.		Transient analysis, Transients in RL, RC circuits, initial conditions, time constants	23	Offline & Open discussions
20.		Transient analysis, Transients in RLC circuits, initial conditions, time constants	24	Online & demonstration based learning
21.	Unit 4	Steady state analysis – concept of phasor and vector	25-26	Online & demonstration based learning
22.		Steady state analysis – concept of impedance and admittance	27	Offline & Open discussions
23.		Node and mesh analysis of RL, RC and RLC networks with sinusoidal and driving sources	28	Online & demonstration based learning
24.		Resonance and Q-factor.	29	Online & demonstration based learning
25.		Concept of Ports	30	Offline & Open discussions
26.		Network functions of one port & two ports	31	Offline & activity based learning
27.		Calculation of network functions for one port	32	Online & demonstration based learning
28.	Unit 5	Calculation of network functions for two port	33	Offline& Experiment with problem solving in group based learning
29.		Pole & zeros of network of different kinds	34	Offline & Open discussions
30.		Two port parameters – Z& Y Parameters	35	Offline& Onsite/ field visit based Learning
31.		Two port parameters –hybrid and chain Parameters	36	Offline& Onsite/ field visit based Learning
32.		Relationship between Parameters	37-38	Offline & Open discussions

Online	Offline						
	Black Board Teaching	Group based Learning	Learning through projects	Learning through demonstration	Learning through experimentation	Activity based Learning	Onsite/field based learning
20.93%	69.77%	37.21%	13.95	27.90%	48.84%	13.95%	09.30%

Dr. Rahul Dubey   Prof. Pooja Sahoo

Department of Electronics Engineering

Name of Course with Code: Computer Programming (14241102/20241102)	Class: Electronics (EL), Electronics & Telecommunication (ET) I Sem.		Session: July-December 2024
S. No.	**Unit**	**Content to be Covered**	**Teaching Session**	**Mode**
1.	Unit 1	Overview of Programming Languages – Offline.	1	Offline & Open discussions
2.		Execution Process, Algorithms and Flowcharts.	2	Black Board Teaching
3.		Introduction to C++.	3	Black Board Teaching
4.		Operators & Expressions.	4	Black Board Teaching
5.		Input/Output, Operators & Expressions, Precedence of operators	5	Black Board Teaching & problem solving based learning
6.	Unit 2	Conditional Statements: if, if-else, nested if, switch statement with break and default	6	Online & demonstration based learning
7.		Loops: while, do-while, for, nested for	7-8	Black Board Teaching & Group based Learning
8.		Loop Control: break, continue, return	9	Online & demonstration based learning
9.		Decision making using logical operators	10-11	Online & demonstration based learning
10.	Unit 3	C++ Function Basics – Application and Syntax	12-13	Black Board Teaching & problem solving based learning
11.		Function Declaration and Definition, Function syntax	14-15	Black Board Teaching & Learning through projects
12.		Parameter types and names, Return types and values, Function Types	16-17	Online & demonstration based learning
13.		Function Scope and Lifetime, Function Templates	18-19	Black Board Teaching & problem solving based learning
14.		Real-world Problem Solving using functions	20-21	Black Board Teaching & problem solving based learning
15.		Recursion, Recursive function definition.	22	Black Board Teaching & Learning through experimentation
16.	Unit 4	C-style strings and C++ string class	23	Black Board Teaching & Open discussions
17.		Declaring and initializing strings	24-25	Black Board Teaching & problem solving based learning
18.		String functions	26-27	Black Board Teaching / Slides

19.		One-dimensional and multi-dimensional arrays	28-29	Black Board Teaching / Slides + Learning through experimentation
20.		Basics of Pointers, Reference Variables	30	Black Board Teaching / Slides + Activity based Learning
21.		Features of OOPS, Comparison of Procedural Oriented Programming with Object Oriented Programming,	31-32	Flipped Class Online Mode
22.		Abstract Data Types, Specification of Class	33-35	Black Board Teaching / Slides
23.	Unit 5	Visibility Modes, Defining Member Functions, Scope Resolution Operator	36	Flipped Class Online Mode
24.		Creating of Objects, Static Data Member, Static Member Function,	37-38	Learning through projects + Learning through experimentation
25.		Array of Objects, Object as Arguments, Inline Function, Friend Function.	39-40	Black Board Teaching / Slides + Learning through experimentation

Online	Offline						
	Black Board Teaching	Group based Learning	Learning through projects	Learning through demonstration	Learning through experimentation	Activity based Learning	Onsite/field based learning
7.89%	65.75%	5.26%	2.66%	10.52%	5.26%	2.66%	--

Dr. HIMANSHU SINGH