माधव प्रौद्योगिकी एवं विज्ञान संस्थान, ग्वालियर
MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
Deemed University
(Declared under Distinct Category by Ministry of Education, Government of India)
NAAC ACCREDITED WITH A++ Grade
Gola Ka Mandir, Gwalior (M.P.)– 474005, INDIA
Ph.:+91-751-2409300, E–mail: vicechancellor@mitsgwalior.in, Website: www.mitsgwalior.in

DEPARTMENT OF ELECTRONICS ENGINEERING

Multiple Mode Teaching Learning Pattern (MMTLP)

Name of Course with Code: Data Communication (14241201/20241201)		Class: B. Tech. EC I Year (II Sem)		Session: Jan-June 2025	
S. No.	**Unit**	**Content to be Covered**	**Teaching Session**	**Mode**	
1.	Unit 1	Introduction to Subject	1	Offline & open discussions	
2.		Introduction to Switching Techniques- Circuit Switching	2	Offline & open discussions	
3.		Message Switching & Packet Switching	3	Offline & open discussions	
4.		Protocols, Network Architectures	4	Offline & open discussions	
5.		OSI Model	5	Offline & open discussions	
6.		TCP/IP Model	6	Offline & open discussions	
7.		Physical layer transmission medium, RS 232 C, Modem	7	Offline & open discussions	
8.		Topologies	8	Offline & open discussions	
9.	Unit 2	Framing BSC, HDLC, ARQ	9	Offline & Problem solving based learning	
10.		Stop and wait, Sliding window, Efficiency	10	Offline & Learning through experimentation	
11.		Error detection and Error correction	11	Offline and open discussion, learning through project	
12.		Hamming codes, Parity checks – CRC, Checksum, HARQ	12-15	Offline, Open discussions, and problem solving based learning	
13.	Unit 3	Introduction to MAC Sub-Layer	16	Offline & problem-solving based learning	
14.		LAN Protocols	17	Offline & open discussions	
15.		ALOHA, Slotted and pure ALOHA	18-20	Online & open discussion	
16.		CSMA, CSMA/CD, Token bus, Token Ring, TDMA, CDMA, FDMA	21-23	Offline & problem-solving based learning	
17.		Ethernet, Bridge, Router Gateway, Switch.	24-26	Offline & open discussions	
18.	Unit 4	Routing–Datagram and Virtual Circuit	27	Offline & demonstration-based learning	
19.		Distance vector routing and Link state Routing	28	Offline & problem-solving-based learning, group-based learning	
20.		Dijkstra's Algorithms	29	Offline & problem-solving-based learning, group-based learning	
21.		Congestion Control: Leaky bucket algorithm, Slow start	30	Offline & problem-solving based learning, group-based learning	
22.		ATM model and ATM traffic	31	Offline & open discussions	

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		management – AAL, X.25		
23.		IP layer, IP addressing	32	Offline & open discussions
24.	Unit 5	Connection-oriented transport protocol mechanism,	33	Offline & open discussions
25.		TCP, Transport flow regulation	34	Offline & open discussions
26.		UDP Segmentation & Reassemble,	35	Offline & open discussions
27.		Session and Transport Interaction, Synchronization, Session Protocols	36	Offline & open discussions
28.		FTP, Remote login.	37	Offline & open discussions
29.		Signals and Transmission,	38	Offline & open discussions
30.		Data Encoding	39	Offline & open discussions
31.		Transmission Media, Transmission Impairments,	40	Offline & open discussions
32.		Multiplexing, Transmission Modes,	41	Offline & open discussions
33.		Networking Devices, Error Detection and Correction,	42	Offline & open discussions
34.		Physical Layer Protocols,	43	Offline & open discussions
35.		Link Budget and Signal-to-Noise Ratio	44	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
19%	64%	5%	2%	3%	-	7%	-

Dr. Himanshu Singh   **Dr. Mukesh Kumar Mishra**

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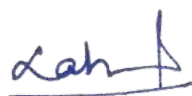A Govt. Added UGC Autonomous and NAAC Accredited Institute, Affiliated to R.G.P.V, Bhopal

DEPARTMENT OF ELECTRONICS ENGINEERING

Multiple Mode Teaching Learning Pattern

Name of Course with Code: Signals & Systems (14241203/20241203)		Class: B. Tech. I Year (EL Section-A & B)	Session: Jan -June 2025	
S. No.	**Unit**	**Content to be Covered**	**Teaching Session**	**Mode**
1.	Unit 1	Mathematical Description of Continuous & Discrete	1	Offline & Open discussions
2.		Time Signals Definition, Classification of signals	2	Offline & activity based learning
3.		Unit Step, Signum, Unit Ramp, Unit Impulse	3	Offline & Open discussions
4.		Periodic Impulse or Impulse Train, Rectangle, Triangle, Sinc and Gaussian pulse functions, Even and Odd Functions	4-5	Offline& Experiment with problem solving in group based learning
5.		Periodic and non-periodic Functions, Signal Energy and Power	6	Online & demonstration based learning
6.		Scaling and Shifting, Amplitude Scaling, Time Shifting.	7	Offline & Open discussions
7.	Unit 2	Introduction to Fourier transforms	8	Offline & problem solving based learning
8.		Limitation of Fourier series	9	Offline & problem solving based learning
9.		Fourier Transforms of elementary functions.	10	Offline & problem solving based learning
10.		Fourier Transforms of various functions	11	Online & demonstration based learning
11.		Fourier Transforms of various functions	12	Offline & problem solving based learning
12.		Properties of Fourier Transform	13,14	Offline & problem solving based learning
13.		Properties of Fourier Transform	15,16	Offline& Experiment with problem solving in group based learning
14.		Introduction to Z-transform	17	Offline& Onsite/ field visit based Learning
15.		Relation between Laplace and Z-transform	18	Offline& Onsite/ field visit based Learning
16.		Relation between Fourier transform and Z-transform	19	Offline&Open discussions

17.	Unit 3	ROC, Properties of ROC	20	Online & demonstration based learning
18.		Properties of Z-transform, Inverse Z-transform.	21-22	Offline& Onsite/ field visit based Learning
19.		Classification of systems	23	Offline&Open discussions
20.		System Properties: Homogeneity, Time Invariance	24	Online & demonstration based learning
21.		Additivity, Linearity, Superposition, Stability	25-26	Online & demonstration based learning
22.	Unit 4	Causality (Causal and Non-causal systems)	27	Offline&Opendiscussions
23.		Memory, Static – Dynamic system	28	Online & demonstration based learning
24.		Nonlinearity, Inevitability.	29	Online & demonstration based learning
25.		Convolution theorem for Continuous System	30	Offline&Open discussions
26.		Examples of continuous convolution	31	Offline & activity based learning
27.		Properties of Linear Convolution,	33	Online & demonstration based learning
28.	Unit 5	Example of linear convolution	34	Offline& Experiment with problem solving in group based learning
29.		Graphical Convolution	35	Offline&Open discussions
30.		Example of Graphical Convolution	35	Offline& Onsite/ field visit based Learning
31.		Discrete Convolution	36	Offline& Onsite/ field visit based Learning
32.		Summary and discussion	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

D. K. Parsediya

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DEPARTMENT OF ELECTRONICS ENGINEERING

Multiple Mode Teaching Learning Pattern

Name of Course with Code: Electronic circuits(3200222)		Class: B. Tech. I Year EC/ET II Sem. Section A-B	Session: Jan-June 2025
S. No.	**Unit**	**Content to be Covered**	**Teaching Session**	**Mode**
1.	Unit 1	Review of P-N Junction Diodes	1	Offline & Open discussions
2.		Working principle of Zener and Avalanche Breakdown	2	Offline & Open discussions
3.		Power supply parameters, Concept of SMPS and its uses	3-4	Offline & problem solving based learning
4.		Zener voltage regulator, series pass regulator	5-6	Offline & problem solving based learning
5.		shunt voltage regulators, Short circuit protection.	7	Offline & problem solving based learning
6.	Unit 2	Review of BJTs, Transistor biasing and bias stabilization, Operating point	8-9	Offline & problem solving based learning
7.		Stability factor, Analysis of fixed base bias, Voltage divider bias	10-11	Offline & problem solving based learning
8.		Analysis of collector to base bias and numerical problems	12-13	Offline & problem solving based learning
9.		Emitter resistance bias circuit and Bias compensation techniques.	14	Offline & Open discussions
10.	Unit 3	Low frequency BJT amplifiers, equivalent circuit	15	Online & demonstration based learning
11.		BJT using h parameter for CB, CE, CC configurations	16	Online & demonstration based learning
12.		Calculation of transistor parameter for CB, CE, CC using h parameters	17-18	Offline & problem solving based learning
13.		High frequency BJT amplifier: Hybrid-pi (π) common emitter transistor model	19-23	Offline & problem solving based learning
14.		Hybrid-pi (π) common emitter transistor model, gain-bandwidth product.	24	Online & demonstration based learning

15.	Unit 4	Feedback concept and its application	25	Offline & problem solving based learning
16.		Feedback Amplifiers & their design parameters	26	Offline & problem solvingbased learning
17.		Comparison of different feedback amplifier configuration	27-28	Offline & problem solvingbased learning
18.		Cascading of BJT amplifier, Darlington Pair	29-30	Offline & demonstration based learning
19.	Unit 5	Fundamental of oscillators ,Tuned circuit	31	Offline & Open discussions
20.		L-C oscillators and its working	32	Offline & demonstration based learning
21.		RC oscillators and its working, Wien Bridge and crystal oscillators	33-34	Offline & demonstration based learning
22.		Clapp oscillator, Tuned amplifier design using BJTs.	35-36	Offline & problem solving based learning

Online	Offline						
	Black Board Teaching	Group based Learning	Learning through projects	Learning through demonstration	Learning through experimentation	Activity based Learning	Onsite/field based learning
13.22%	85.71%	37.21%	13.95	27.90%	48.84.%	13.95%	%

Dr Dablu Kumar

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Multiple Mode Teaching Learning Pattern (MMTLP)

Name of Course with Code: Sustainability & Environmental Science (14241212)		Class: B. Tech. ET II Year (III Sem)		Session: Jan-June-2025
S. No.	**Unit**	**Content to be Covered**	**Teaching Session**	**Mode**
1.	Unit 1	Introduction to Subject	1	Offline & open discussions
2.		Introduction to Environmental Science: definition, importance, and its components	2	Offline & open discussions
3.		Ecosystem and its components	3	Offline & open discussions
4.		Water cycle, carbon cycle, food chain, energy flow in ecosystem	4	Offline & open discussions
5.		Current state of the environment in India and world	5	Offline & open discussions
6.		Root causes of environmental degradation (social, psychological, cultural)	6	Offline & open discussions
7.		Introduction to Environmental Pollution: air, water, noise.	7	Offline & open discussions
8.		Introduction to soil, thermal, and radioactive.	8	Offline & open discussions
9.	Unit 2	Environmental Pollution: causes, impacts, pollution control techniques	9	Offline & Problem solving based learning
10.		Solid waste management: Principles, hazardous waste management (e-waste, plastic waste)	10	Offline & Learning through experimentation
11.		Global environmental issues: Climate change	11	Offline and open discussion, learning through project
12.		global warming, ozone layer depletion	12-15	Offline, Open discussions and problem solving based learning
13.	Unit 3	Environmental policies and laws in India: Environmental Protection Act, Water Act, Air Act	16	Offline & problem solving based learning
14.		Global environmental policies: Kyoto Protocol, Montreal Protocol, COP Summits	17	Offline & open discussions
15.		Clean Development Mechanism,	18-20	Online &open discission
16.		Carbon Credit, Carbon Trading	21-23	Offline & problem solving based learning
17.		Environmental Audit	24-26	Offline & open discussions
18.	Unit 4	Sustainability concepts: definition, importance.	27	Offline & demonstration-based learning
19.		Pillars of sustainability (economic, environmental, social) Sustainable development and UN	28	Offline & problem solving based learning, group based learning
20.		Sustainable Development Goals (SDGs).	29	Offline & problem-solving based learning, group based learning
21.		Circular economy, resource efficiency, energy conservation.	30	Offline & problem solving based learning.
22.		Green buildings sustainability	31	Offline & open discussions

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23.		sustainable manufacturing	32	Offline & open discussions
24.	Unit 5	Sustainable Energy Solutions: need, types, applications	33	Offline & open discussions
25.		Hydrogen energy, ocean energy sources, tidal energy conversion	34	Offline & open discussions
26.		Geothermal energy: concept, origin, power plants	35	Offline & open discussions
27.		Renewable energy sources: water, wind, etc.	36	Offline & open discussions
28.		Sustainable materials and construction practices	37	Offline & open discussions
29.		Sustainable transportation systems	38	Offline & open discussions
30.		Sustainable water infrastructure	39	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
19%	64%	5%	2%	3%	-	7%	-

Prateek Bhadauria
Assistant Professor,
Department of Electronics Engineering