

# 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 (MMTLP)

Name of Course with Code: Data Communication (140519)		Class: B. Tech. EC III Year (V Sem)	Session: July-Dec 2023	
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 discussion
3.		Message Switching & Packet Switching	3	Offline&Open discussions
4.		Protocols, Network Architectures	4	Offline & open discussion
5.		OSI Model	5	Offline & open discussion
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	Online&open discussion
15.		ALOHA, Slotted and pure ALOHA	18-20	Online&open discission
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 Discussion
18.	Unit 4	Routing–Data gram and Virtual Circuit	27	Offline&demonstrationbasedl earning
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 discussion

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		management – AAL, X.25		
23.		IP layer, IP addressing	32	Online&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	OnlineOpen 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 discussion
34.		Physical Layer Protocols,	43	Offline&Open discussions
35.		Link Budget and Signal-to-Noise Ratio (SNR).	44	Offline&Open discussions

Online	Offline						
	Black Board Teaching	Group based Learning	Learning through projects	Learning through dmonstration	Learning through experimentation	Activity based Learning	Onsite/field based learning
19%	64%	5%	2%	3%	-	7%	-



Prof. D. K. Parsediya

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**DEPARTMENT OF ELECTRONICS ENGINEERING**

**Multiple Mode Teaching Learning Pattern**

Name of Course with Code: Digital Signal Processing (140615)		Class: B. Tech. III Year	Session: July-Dec 2023	
S. No.	Unit	Content to be Covered	Teaching Session	Mode
1.	Unit 1	Review of discrete time signals and systems	1	Offline & Open discussions
2.		Properties and applications of discrete time Fourier transform	2	Offline & activity based learning
3.		Review of Z transform	3	Offline & Open discussions
4.		Analysis of minimum phase	4-5	Offline & Experiment with problem solving in group based learning
5.		Maximum phase and inverse system.	6	Online & demonstration based learning
6.	Unit 2	Introduction and properties of DFT.	7	Offline & problem solving based learning
7.		Computation of circular convolution using DFT.	8	Offline & problem solving based learning
8.		Decimation in time FFT algorithm.	9	Offline & problem solving based learning
9.		Decimation of frequency FFT algorithm with radix-2.	10	Offline & problem solving based learning
10.		Decimation of frequency FFT algorithm with radix-4.	11	Offline & problem solving based learning
11.		Review of Unit-II	12	Online
12.	Unit 3	Characteristics of practical frequency selective filters.	13	Offline & Experiment with problem solving in group based learning
13.		Various signal flow graph structure of IIR filters.	14	Offline & Experiment with problem solving in group based learning
14.		IIR Filter design.	15	Offline & Experiment with problem solving in group based learning
15.		Overview of Butterworth	16	Offline & Experiment with problem solving in group based learning
16.		Chebyshev and Elliptic Approximations.	17	Offline & Experiment with problem solving in group

				based learning
17.		Design of discrete time IIR filters using Impulse invariant.	18	Offline & Open discussions
18.		Bilinear transformation Methods.	19	Offline & Experiment with problem solving in group based learning
19.		Spectral transformation of IIR filters.	20	Offline & Experiment with problem solving in group based learning
20.	<b>Unit 4</b>	Introduction and Signal flow graph structure of FIR Filter.	21	Offline & Experiment with problem solving in group based learning
21.		Symmetric, and Asymmetric FIR filters.	22	Offline & Experiment with problem solving in group based learning
22.		Design of linear phase FIR filters using windows.	23	Offline & Learning through projects
23.		Frequency sampling method.	24	Online & demonstration based learning
24.		Design of Optimum Equiripple linear phase FIR filters.	25	Offline & group based learning
25.		Design of FIR differentiators.	26	Online & demonstration based learning
26.		Introduction	27	Online & demonstration based learning
27.		Decimation and Interpolation.	28	Offline & group based learning
28.	<b>Unit 5</b>	Sampling rate conversion by a Rational factor.	29	Online & demonstration based learning
29.		Sampling rate conversion with Cascaded integrator.	30	Offline & Experiment with problem solving in group based learning
30.		Comb filters	31	Offline & Open discussions
31.		Polyphase structures for decimation.	32	Offline & Onsite/ field visit based Learning
32.		Interpolation filters.	33	Offline & Onsite/ field visit based Learning
33.		Application of multirate signal processing.	34	Offline & Onsite/ field visit based Learning
34.		Review of Unit-V	35	Online & demonstration 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
22.8	11.42	5.71	2.85	2.85	31.42	11.42	11.42



**Dr. Hemant Choubey**

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## DEPARTMENT OF ELECTRONICS ENGINEERING

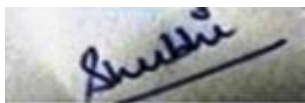
### Multiple Mode Teaching Learning Pattern

Name of Course with Code: Data Science (140511/200511)		Class: B. Tech. III Year	Session: July-Dec 2023	
S. No.	Unit	Content to be Covered	Teaching Session	Mode
1.	Unit 1	Need for data science, benefits and uses, facets of data, data science process,	1	Offline & Demonstration based discussions
2.		Introduction of basics python tool, Setting working Directory, Creating and saving a script file, File execution	2-3	Offline & Open discussions
3.		removing variables from environment, clearing environment, Commenting script files, Variable creation	4	Offline & Open discussions
4.		Data types and associated operations,	5	Offline & Demonstration based learning
5.		Arithmetic and logical operators.	6-8	Offline & problem solving based learning
6.		Arithmetic and logical operators.	9-10	Offline & Open discussions
7.	Unit 2	Control structures, loop, Functions, data structures:	11-13	Offline & problem solving based learning
8.		Lists, Arrays, Tuples, Dictionary, Sets	14-15	Offline & Open discussions
9.		NumPy library, Data Collection: Getting to know your data, Types of Data, Data collection strategies	16	Offline & problem solving based learning
10.		Data Pre-processing, Feature engineering, Exploratory Data Analytics.	17	Offline & problem solving based learning
11.	Unit 3	Inverting and non-inverting amplifier configurations,	18	Online & demonstration based learning
12.		Descriptive Statistics	19-20	Offline & problem solving based learning
13.		Mean, Standard Deviation, Skewness and Kurtosis	21-22	Offline & problem solving based learning



14.		inferential statistics: hypothesis testing, probability: probability theory	23	Online & demonstration based learning
15.		conditional probability Pandas library, dataframe and dataframe related operations, Reading files.	24	Online & demonstration based learning
16.	Unit 4	Different passive and active filters	25-27	Offline & Open discussions
17.		Data Cleaning and Preparation, Handling Missing Data, Data Transformations using pandas and sklearn library, Removing Duplicates, Replacing Values,	28-29	Online & demonstration based learning
18.	Unit 5	Detecting Outliers. Data visualization on different dataset using matplotlib and seaborn libraries, Scatter plot, Line plot, Bar plot, Histogram, Box plot, Pair plot.	30	Offline & Open discussions
19.		Supervised learning: Regression, classification, Linear regression, logistic regression, decision tree, tree creation with entropy and information gain, ID3 algorithm, random forest, naïve bayes theorem	31-32	Online & demonstration based learning
20.		K-nearest neighbor and ensemble methods for solving real world problems,	33	Offline & demonstration based learning
21.		Unsupervised learning: Clustering, Reinforcement learning	34	Offline & demonstration based learning
22.		numerical based on it	35	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
20%	80%	37.21%	13.95%	25.71%	48.84.%	13.95%	-%



**Dr. Shubhi kansal**



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### Multiple Mode Teaching Learning Pattern

Name of Course with Code: Digital Signal Processing (140520)		Class: B. Tech. III Year	Session: July-Dec 2023	
S. No.	Unit	Content to be Covered	Teaching Session	Mode
1.	Unit 1	Review of discrete time signals and systems	1	Offline & Open discussions
2.		Properties and applications of discrete time Fourier transform	2	Offline & activity based learning
3.		Review of Z transform	3	Offline & Open discussions
4.		Analysis of minimum phase	4-5	Offline & Experiment with problem solving in group based learning
5.		Maximum phase and inverse system.	6	Online & demonstration based learning
6.	Unit 2	Introduction and properties of DFT.	7	Offline & problem solving based learning
7.		Computation of circular convolution using DFT.	8	Offline & problem solving based learning
8.		Decimation in time FFT algorithm.	9	Offline & problem solving based learning
9.		Decimation of frequency FFT algorithm with radix-2.	10	Offline & problem solving based learning
10.		Decimation of frequency FFT algorithm with radix-4.	11	Offline & problem solving based learning
11.		Review of Unit-II	12	Online
12.	Unit 3	Characteristics of practical frequency selective filters.	13	Offline & Experiment with problem solving in group based learning
13.		Various signal flow graph structure of IIR filters.	14	Offline & Experiment with problem solving in group based learning
14.		IIR Filter design.	15	Offline & Experiment with problem solving in group based learning
15.		Overview of Butterworth	16	Offline & Experiment with problem solving in group based learning
16.		Chebyshev and Elliptic Approximations.	17	Offline & Experiment with problem solving in group

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## DEPARTMENT OF ELECTRONICS ENGINEERING

						based learning	
17.		Design of discrete time IIR filters using Impulse invariant.	18			Offline & Open discussions	
18.		Bilinear transformation Methods.	19			Offline & Experiment with problem solving in group based learning	
19.		Spectral transformation of IIR filters.	20			Offline & Experiment with problem solving in group based learning	
20.	Unit 4	Introduction and Signal flow graph structure of FIR Filter.	21			Offline & Experiment with problem solving in group based learning	
21.		Symmetric, and Asymmetric FIR filters.	22			Offline & Experiment with problem solving in group based learning	
22.		Design of linear phase FIR filters using windows.	23			Offline & Learning through projects	
23.		Frequency sampling method.	24			Online & demonstration based learning	
24.		Design of Optimum Equiripple linear phase FIR filters.	25			Offline & group based learning	
25.		Design of FIR differentiators.	26			Online & demonstration based learning	
26.		Unit 5	Introduction	27			Online & demonstration based learning
27.			Decimation and Interpolation.	28			Offline & group based learning
28.	Sampling rate conversion by a Rational factor.		29			Online & demonstration based learning	
29.	Sampling rate conversion with Cascaded integrator.		30			Offline & Experiment with problem solving in group based learning	
30.	Comb filters		31			Offline & Open discussions	
31.	Polyphase structures for decimation.		32			Offline & Onsite/ field visit based Learning	
32.	Interpolation filters.		33			Offline & Onsite/ field visit based Learning	
33.	Application of multirate signal processing.		34			Offline & Onsite/ field visit based Learning	
34.	Review of Unit-V	35			Online & demonstration 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
22.8	11.42	5.71	2.85	2.85	31.42	11.42	11.42

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**Dr. Rahul Dubey**  
Assistant Professor  
Dept. of Electronics Engineering

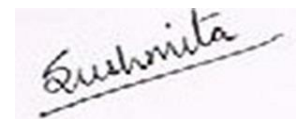


## Department of Electronics Engineering

Name of Course with Code: Microprocessor & Interfacing (140512/200512)		Class: Electronics (EC),	Session: July-December 2023	
S. No.	Unit	Content to be Covered	Teaching Session	Mode
1.	Unit 1	History and evolution of microprocessor and their classification	1	Offline & Open discussions
2.		Introduction to microprocessors and microcomputers	2	Black Board Teaching
3.		Study of 8 bit Microprocessor	3	Black Board Teaching
4.		8085 pin configuration, Internal Architecture and operations	4	Black Board Teaching
5.		Interrupts, Interrupts and interrupt service routine.	5	Black Board Teaching & problem solving based learning
6.	Unit 2	8085 instruction set	6	Online & demonstration based learning
7.		8085 assembly language programming, Addressing modes	7-8	Black Board Teaching & Group based Learning
8.		Counters and time Delays	9	Online & demonstration based learning
9.		Instruction cycle and machine cycle, T-states, timing diagram for 8085 instructions	10-11	Online & demonstration based learning
10.	Unit 3	Introduction to memory interfacing	12	Black Board Teaching & problem solving based learning
11.		Programmable input/output ports 8255	13	Black Board Teaching & problem solving based learning
12.		Programmable interval timer 8253	14	Online & demonstration based learning
13.		Programmable communication interface 8251 USART	15-16	Black Board Teaching & problem solving based learning
14.		Programmable interrupt controller 8259	17-18	Black Board Teaching & problem solving based learning
15.		DMA controller 8257	18	Black Board Teaching & Learning through experimentation
16.	Unit 4	8086 Block diagram and architecture, Pin configuration of 8086	19-20	Black Board Teaching & Open discussions
17.		Execution Unit (EU) and Bus Interface Unit(BIU)	21	Black Board Teaching & problem solving based learning
18.		8086 Minimum mode & Maximum mode Operation	22	Black Board Teaching / Slides & Group based Learning
19.		Memory segmentation	23-24	Black Board Teaching / Slides + Learning through experimentation

20.		Instruction set and addressing modes of 8086	25	Black Board Teaching / Slides + Activity based Learning
21.	Unit 5	8051 architecture, 8051 pin description, I/O configuration	26-27	Flipped Class Online Mode
22.		8051 interrupts, 8051 addressing modes	28-29	Black Board Teaching / Slides
23.		Overview of 8051 instruction set	30	Flipped Class Online Mode
24.		Use of microcontrollers in real time embedded system design	31-32	Learning through projects + 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
23%	56.66%	13.33%	3.33%	16.66%	13.33%	6.66%	-%



Dr. Sushmita Chaudhari



## Department of Electronics Engineering

Name of Course with Code: Electromagnetic Fields (140515/200515)			Class: Electronics (EC) V Sem A & B.	Session: July-December 2023	
S. No.	Unit	Content to be Covered	Teaching Session	CO	Mode
1.	Unit 1	Introduction of vector calculus and Coordinate System	1-2	1	Black Board Teaching & problem solving based learning
2.		Introduction of Coulomb's law	3	1	Black Board Teaching & problem solving based learning
3.		Electric field intensity	4	1	Black Board Teaching
4.		Electric field intensity due to charge distribution	5	1	Black Board Teaching
5.		Electric flux and flux density	6	1	Black Board Teaching & problem solving based learning
6.		Gauss law and boundary relation	7	1,3	Black Board Teaching
7.		Divergence and Divergence theorem	8	1	Black Board Teaching
8.		Curl, Scalar and Vector potential, Stoke's theorem	9	1	Black Board Teaching
9.		Electric field in dielectric and conductor, continuity equation	10	1	Black Board Teaching
10.		Poisson and Laplace's equation	11-12	1	Black Board Teaching & problem solving based learning
11.	Unit 2	Magnetic field and magnetic field theory	13	2	Online & demonstration based learning
12.		Biot Savart Law	14	2	Black Board Teaching & problem solving based learning
13.		Ampere's circuit law	15	2	Online & demonstration based learning
14.		Magnetic field intensity due to straight conductor	16	2	Online & demonstration based learning
15.		Magnetic field intensity on circular loop and infinite sheet of current	17	2	Online & demonstration based learning
16.		Magnetic flux and flux density	18	2	Online & demonstration based learning
17.		Magnetic materials - Magnetization	19	2	Online & demonstration based learning
18.	Unit 3	Magnetic fields in multiple media, Boundary condition	20	4	Black Board Teaching & problem solving based learning
19.		Magnetic scalar and vector potentials	21	4	Black Board Teaching & Learning through projects
20.		Poisson's equation	22	4	Online & demonstration based learning
21.		Magnetic force and force between current carrying wires	23	4	Black Board Teaching & problem solving based learning
22.		Magnetic circuit	24	4	Black Board Teaching & problem solving based learning
23.		Faraday's law	25	4	Black Board Teaching & Learning through experimentation
24.	Displacement current	26	4	Black Board Teaching & problem solving based learning	

25.		Maxwell's equations	27	3,4	Black Board Teaching & problem solving based learning
26.		Boundary conditions for time varying fields	28	3,4	Black Board Teaching & problem solving based learning
27.	Unit 4	General Wave Equation	29	5	Black Board Teaching & Open discussions
28.		Uniform plane waves in free space	30	5	Black Board Teaching & problem solving based learning
29.		Uniform plane waves in perfect dielectric	31	5	Black Board Teaching / Slides & Group based Learning
30.		Uniform plane wave in lossy dielectric and conducting medium	32	5	Black Board Teaching / Activity based learning
31.		Skin depth, Poynting vector and Poynting theorem	33	5	Black Board Teaching / Slides
32.	Unit 5	Wave Polarization	34	5	Black Board Teaching / Slides
33.		Linear Polarization	35	5	Black Board Teaching / Slides
34.		Elliptic Polarization	36	5	Black Board Teaching / Slides
35.		Circular Polarization	37	5	Black Board Teaching / Slides
36.		Reflection of Uniform Plane waves	38	5	Online & demonstration based learning
37.		Normal Incidence	39	5	Online & group based learning
38.		Oblique Incidence	40	5	Online & group based learning
39.		Brewster Angle	41	5	Online & group based learning
40.		Total internal reflection	42	5	Online & demonstration based learning

Online	Offline						
	Black Board Teaching	Group based Learning	Learning through projects	Learning through demonstration	Learning through experimentation	Activity /Problem based Learning	Onsite/field based learning/Open Discussion
28.5%	66.6%	7.1%	2.3%	21.4%	2.3%	28.5%	2.3%