MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR
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DEPARTMENT OF ELECTRONICS ENGINEERING

Multiple Mode Teaching Learning Pattern

Name of Course with Code: Satellite & Radar Communication (140711/200711)		Class: B. Tech. IY Year		Session: July –Dec. 2024
S. No.	**Unit**	**Content to be Covered**	**Teaching Session**	**Mode**
1.	Unit 1	Introduction to Satellite Communication,	1	Offline & Open discussions
2.		Origin and History of Satellite Communication	2	Offline & Open discussions
3.		Current State of Satellite Communication	3	Offline & activity based learning
4.		Orbital Aspect of Satellite Communication , Orbital Mechanism, Equation of Orbit	4-5	Offline & Experiment with problem solving in group based learning
5.		Locating Satellite in Orbit , Orbital Elements	6	Online & demonstration based learning
6.		Orbital Perturbation , Frequency Allocations and Applications	7	Offline & Open discussions
7.	Unit 2	Altitude and Orbit Control System	8	Offline & problem solving based learning
8.		Telemetry Tracking and Commend Power System, Communication Sub System	9	Offline & problem solving based learning
9.		Earth Station Design , Antenna Tracking	10	Offline & problem solving based learning
10.		LNA	11	Online &demonstration based learning
11.		HPA,RF	12	Offline & problem solving based learning
12.		Multiplexing Factor Affecting Orbit Utilization	13,14	Offline & problem solving based learning
13.		Tracking, Equipment for Earth Station.	15,16	Offline& Experiment with problem solving in group based learning
14.		Satellite Link Design	17	Offline & Open discussions
15.		System Noise Temperature and G/T Ratio	18	Offline & Open discussions
16.		Downlink Design	19	Offline & Open discussions
17.		Domestic Satellite System, Uplink Design	20	Online & demonstration based learning

18.	Unit 3	Earth Path Propagation Effect	21-22	Offline & problem solving based learning
19.		Losses in Link Design.		
20.		Principles of RADAR, Radar Frequencies	23	Offline & Open discussions
21.		Pulse RADAR, RADAR Range Equation	24	Online &demonstration based learning
22.		RADAR Application	25-26	Online &demonstration based learning
23.	Unit 4	RADAR Cross Section of Targets RADAR Indicator	27	Offline & Open discussions
24.		Noise Figure of Receiver	28	Online &demonstration based learning
25.		Mixer Duplexer, Line Pulsar.	29	Online &demonstration based learning
26.		MTI RADAR	30	Offline & Open discussions
27.		Delay Line Canceller	31	Offline & activity based learning
28.	Unit 5	Digital Signal Processing	32	Online & demonstration based learning
29.		Limitation of MTI RADAR, CW RADAR	33-34	Offline & Experiment with problem solving in group based learning
30.		FM CW RADAR	35	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
22%	28.57%	8.57%	00%	22%	8.57%	5.714%	00%

Dr. R. P. Narwaria

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Multiple Mode Teaching Learning Pattern

Name of Course with Code: Stochastic Processes (140716)		Class: B. Tech. IV Year		Session: July-Dec 2024
S. No.	**Unit**	**Content to be Covered**	**Teaching Session**	**Mode**
1.	Unit 1	Introduction to Probability, Experiment, Sample Space, Event, Properties of probability	1	Offline & Open discussions
2.		Joint Probability & properties	2	Offline & activity based learning
3.		MAP detection, Conditional probability,	3	Offline & Open discussions
4.		Probability of statistically independent events	4	Offline & Experiment with problem solving in group based learning
5.		Bay's theorem	5	Online & demonstration based learning
6.		Problem Solving Session	6-7	Offline & Open discussions
7.	Unit 2	Discrete random variable, Continuous random variable	8-9	Offline & problem solving based learning
8.		Probability distribution function of discrete random variable,	10	Offline & problem solving based learning
9.		Cumulative distribution function, properties of CDF	11	Offline & problem solving based learning
10.		CDF for discrete random variables Probability density function (PDF), properties of PDF	12	Online & demonstration based learning
11.		Problem Solving Session	13	Offline & problem solving based learning
12.		Joint cumulative distribution function, properties of joint CDF	14	Offline & problem solving based learning
13.		Joint Probability density function, properties of joint PDF	15	Offline & Experiment with problem solving in group based learning
14.		Problem Solving Session	16	Offline & Open discussions
15.		Mean value of continuous random variable, Mean value of discrete random variable	17	Offline & Onsite/ field visit based Learning

		Moments and variance, Uniform distribution		
16.	Unit 3	Gaussian distribution, Properties of Gaussian PDF	18	Offline & Onsite/ field visit based Learning
17.		Rayleigh distribution, complementary error function.	19	Offline & Open discussions
18.		Problem Solving Session	20	Online & demonstration based learning
19.		Coherent and Non coherent BFSK.	21-22	Offline & Onsite/ field visit based Learning
20.		Problem Solving Session	23	Offline & Open discussions
21.	Unit 4	Ensemble averages, time averages,	24	Online & demonstration based learning
22.		Random process, Stationary and Non stationary random processes,	25	Online & demonstration based learning
23.		Wide Sense Stationary process, Ergodic process,	26-27	Offline & Open discussions
24.		Gaussian process, sum of random processes.	28	Online & demonstration based learning
25.		Problem Solving Session	29	Online & demonstration based learning
26.	Unit 5	Correlation function, Autocorrelation function,	30	Offline & Open discussions
27.		Properties of Autocorrelation,	31	Offline & activity based learning
28.		Power spectral densities,	32	Online & demonstration based learning
29.		Energy spectral densities,	33	Offline & Experiment with problem solving in group based learning
30.		Response of linear systems to random inputs	34	Offline & Open discussions
31.		Problem Solving Session	35	Offline & Onsite/ field visit 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
21%	70%	37%	14	28%	48.84.%	13.95%	9%

Dr. Karuna Markam

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DEPARTMENT OF ELECTRONICS ENGINEERING

Multiple Mode Teaching Learning Pattern

Name of Course with Code: Embedded System Design (140715/200715)		Class: B. Tech. IV Year EC &ET	Session: July-Dec 2024	
S. No.	**Unit**	**Content to be Covered**	**Teaching Session**	**Mode**
1.	Unit 1	Embedded system architecture, classification, challenges and design issues	1	Offline & Demonstration based discussions
2.		fundamentals of embedded processor and microcontrollers	2-3	Offline & Open discussions
3.		Von Neumann/Harvard architectures	4	Offline & Open discussions
4.		CISC vs. RISC, microcontrollers types and their selection	5	Offline & Demonstration based learning
5.		Overview of the 8051 family, architecture, pin description	6-8	Offline & problem solving based learning
6.		Flags, Register Banks, Internal Memory Organization, I/O configuration, Special Function Registers, addressing modes.	9-10	Offline & Open discussions
7.	Unit 2	An Overview of 8051 instruction set, Introduction to 8051 assembly programming,	11-13	Offline & problem solving based learning
8.		Arithmetic, logic instructions and programs	14-15	Offline & Open discussions
9.		Jump, loop and call instructions, IO port programming.	16	Offline & problem solving based learning

10.		, Assembling and running an 8051 program	17	Offline & problem solving based learning
11.		Data types and Assembler directives	18	Online & demonstration based learning
12.	Unit 3		19-20	Offline & problem solving based learning
13.		**Basics of Timers/Counters, Programming 8051 timers/Counter**	21-22	Offline & problem solving based learning
14.		basics of serial communication, 8051 connection to RS232	23	Online & demonstration based learning
15.		8051 serial port programming, basics of 8051 Interrupts, 8051 interrupts programming: Timer interrupts, external hardware interrupts and serial communication interrupt, 8051 Interrupt priority	24	Online & demonstration based learning
16.	Unit 4	Memory address decoding, 8051 interfacing with memory,	25-27	Offline & Open discussions
17.		8051 interface with 8255 PPI and various interfacings like: LCD and Matrix Keyboard interfacing with 8051 microcontroller	28-29	Online & demonstration based learning
18.	Unit 5	ADC, DAC and Temperature Sensor interfacing with 8051 microcontroller, Stepper motor interfacing.	30	Offline & Open discussions
19.		Overview of Arduino, Configuration, Interfacing	31-32	Online & demonstration based learning
20.		Board layout, Atmega328 specifications,	33	Offline & demonstration based learning
21.		Interfacing of Arduino with LED, Switches, Light dependent resistor (LDR)	34	Offline & demonstration based learning
22.		PWM, 16*2 LCD, Serial, L293D for motor interfacing, ADC	35	Offline & problem solving based learning

	Offline

Online	Black Board Teaching	Group based Learning	Learning through projects	Learning through demonstration	Learning through experimentation	Activity based Learning	Onsite/field based learning

Rachit Jain

Assistant Professor

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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Department of Electronics Engineering
Lecture Plan

Subject Name: **Telecommunication Switching and Network**
Subject Code: **200716**
Subject Teacher**: Dr. Hemant Choubey**
Session**: July-December 2024**

Days	Content/Topics	CO Mapping
	UNIT-I :Introduction	
1	**Introduction**	1
2	Evolution of Telecommunications	1
3	Simple Telephone Communication	1
3	Manual switching system	1
4	Strowger Switching System	1
5	Crossbar Switching System	1
6	Major telecommunication Networks (PSTN, ISDN, WLAN, Ad Hoc Network)	1
7	Major telecommunication Networks (PSTN, ISDN, WLAN, Ad Hoc Network)	1
8	Review of Unit 1	1
	UNIT-II : Switching	
9	Circuit Switching	1, 2
10	Store and Forward Switching	1, 2
11	Electronic Space Division Switching	1, 2
12	Stored Program Control	1, 2
13	Centralized SPC, Distributed SPC	2
14	Enhanced Services, Two stage networks, three stage network n-stage networks	2
15	Time multiplexed Space Switching, Time Multiplexed time switching	2
16	Combination Switching, Three stage combination switching	2
17	n-stage combination switching	
	UNIT-III : Traffic Engineering	
18	Network Traffic load and parameters	3
19	Grade of service and blocking probability	3
20	Modeling Switching Systems	3
21	Incoming Traffic and Service Time	3
22	Characterization	3
23	Blocking Models and Loss Estimates, Delay systems	3
24	Review of Unit-III	
	UNIT-IV Telephone Networks	
25	Subscriber Loop Systems	4
26	Switching Hierarchy and Routing	4

27	Transmission Plan, Transmission Systems	4
28	Numbering Plan	4
29	Charging Plan	4
30	Signaling Techniques	4
31	In channel signaling	4
32	common channel signaling	4
33	Cellular mobile telephony	4
34	Review of Unit-IV	
	UNIT-V Data networks	
35	Data transmission in PSTNs	5
36	Modems, ISO-OSI/TCP-IP Reference Model,	5
37	Satellite based data networks	5
38	Data network standards	5
39	ISDN, DSL / ADSL	5
41	Token Ring, Token BUS , Bluetooth	5
42	WLAN, ZigBee	5
43	SONET / SDH	5
41	Review of Unit-V	

Dr. Hemant Choubey

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DEPARTMENT OF ELECTRONICS ENGINEERING

Multiple Mode Teaching Learning Pattern

Name of Course with Code: Mobile Communication & 5G Standards (910218)		Class: B. Tech. IV Year		Session: July-Dec. 2024
S. No.	**Unit**	**Content to be Covered**	**Teaching Session**	**Mode**
1.	Unit 1	Introduction to cellular mobile systems: Basic Cellular System,	1	Offline & activity-based learning
2.		Cellular communication infrastructure: Cells, Clusters, Cell Splitting	2	Offline & Open Discussions
3.		Frequency reuse concept, Cellular system components.	3	Offline & Open discussions
4.		Fixed and dynamic, Cellular interferences: Co-Channel and adjacent channel and sectorization.	4-5	Offline & Experiment with problem solving in group based learning
5.		Operations of cellular systems, Handoff/Handover, Channel assignment	6	Online & demonstration based learning
6.		Problem Solving Session	7	Offline & Open discussions
7.	Unit 2	Properties of mobile radio channels – Intersymbol interference	8-9	Offline & problem solving based learning
8.		Multipath and fading effects	10	Offline & problem solving based learning
9.		Interleaving and diversity	11	Online & demonstration based learning
10.		Multiple access schemes (TDMA, FDMA)	12	Offline & problem solvingbased learning
11.		CDMA, SDMA	13	Offline & problem solving based learning
12.		Interuser interference	14	Offline & problem solving based learning
13.		Traffic issues and cell capacity	15	Offline & Experiment with problem solving in group based learning
14.		Problem Solving Session	16	Offline & Open discussions
15.	Unit 3	Pulse shaping, Linear and non-linear Modulation techniques	17	Offline & Onsite/ field visit based Learning
16.		Constant Envelop modulation,	18	Offline & Onsite/ field visit based Learning
17.		QPSK, MSK, GMSK	19	Offline & Open discussions
18.		Spread spectrum modulation techniques	20	Online & demonstration based learning

19.		Direct sequence and Frequency Hopping Spread Spectrum and their applications.	21-22	Offline & Onsite/ field visit based Learning
20.		Problem Solving Session	23	Offline & Open discussions
21.	Unit 4	2G Architecture such as GSM and CDMA based – 2.5G	24	Online & demonstration based learning
22.		GPRS: GPRS and its features	25	Online & demonstration based learning
23.		3G standard details such as UMTS	26-27	Offline & Open discussions
24.		Introduction to LTE	28	Online & demonstration based learning
25.		Basic concept of massive MIMO.	29	Online & demonstration based learning
26.	Unit 5	5G potential and applications	30	Offline & Open discussions
27.		Usage scenarios: enhanced mobile broadband (eMBB),	31	Offline & activity based learning
28.		ultra reliable low latency communications (URLLC)	32	Online & demonstration based learning
29.		massive machine type communications (MMTC)	33	Offline & Experiment with problem solving in group based learning
30.		D2D communications,	34	Offline & Open discussions
31.		V2X communications; Spectrum for 5G and sharing	35	Offline & Onsite/ field visit based Learning

Online	Offline						
	Black Board Teaching	Group based Learning	Learning through projects	Learning through demonstration	Learning through experimentation	Activity based Learning	Onsite/field basedlearning
20.93%	69.77%	37.21%	13.95	27.90%	48.84.%	13.95%	08.30%

Dr. Dablu Kumar

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DEPARTMENT OF ELECTRONICS ENGINEERING

Multiple Mode Teaching Learning Pattern

Name of Course with Code: Consumer Electronics (910217)		Class: B. Tech. IV Year		Session: July Dec- 2024
S. No.	**Unit**	**Content to be Covered**	**Teaching Session**	**Mode**
1.	Unit 1	Basic Concept of Sound and Wave	1	Offline & Open discussions
2.		Working Concept of Microphone	2-3	Offline & Open discussions
3.		Concept of Carbon and Crystal Microphone	4-5	Offline & problem solving based learning
4.		Concept of Moving coil microphone	6-7	Offline & problem solving based learning
5.		Introduction to woofers and it's operation and Hi-Fi system	8-9	Offline & problem solving based learning
6.	Unit 2	Fundamental of Television system and scanning process	10	Online & Open discussions
7.		Concept of persistence of vision and flicker, vertical and horizontal resolution	11-12	Online & problem solving based learning
8.		Fundamental of LCD and Plasma display	13-14	Offline & problem solving based learning
9.		Fundamental of LED TV technology	15	Offline & problem solving based learning
10.	Unit 3	Basic working principle of Telecommunication systems	16	Online & demonstration based learning
11.		Working principle of Modulation techniques: Analog and digital methods	17-19	Offline & Experiment with problem solving in group based learning
12.		Fundamental concept of Radio system and telephone receiver	20-22	Offline & demonstration based learning
14.		Working principle of Cellular Communications	23	Offline & activity based learning
15.		Types and operation of Transmitting and Receiving Antenna	24-25	Offline & activity based learning

16.	Unit 4	Introduction to Digital Cellular Phone, Types of Mobile Phones and Cellular Systems.	26-29	Offline & Experiment with problem solving in group based learning
18.		Working principle of Microwave oven	30-31	Offline & Open discussions
19.	Unit 5	Fundamental of Wave Guides and Magnetrons	32-33	Offline & Onsite/ field visit
20.		Working principle of Air conditioning system and its types	34-35	Offline & Onsite/ field visit

Online	Offline						
	Black Board Teaching	Group based Learning	Learning through projects	Learning through demonstration	Learning through experimentation	Activity based Learning	Onsite/field based learning
11.42%	69.58%	17.14%	13.95%	8.5%	11.42%	13.95%	11.42%

Prof. Madhav Singh