



Kammavari Sangham(R)-1952

K. S. INSTITUTE OF TECHNOLOGY

Approved by AICTE, New Delhi, Affiliated to VTU, Belagavi, Karnataka, Accredited by NACC & NBA (Dept. of CSE, ECE, ME)

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C. 1.1.1: The Institution ensures effective curriculum delivery through a well-planned and documented process:

Supporting Documents:

Index

Sl No.	Academic Year	Particulars
1	2022-23 (Even Sem)	1. Lesson Plan



(20)

K. S. INSTITUTE OF TECHNOLOGY, BENGALURU - 560109
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
LESSON PLAN 2022-23 EVEN SEMESTER

COURSE INCHARGE : BHANUMATHI A
COURSE CODE/TITLE : 21EC42/ DIGITAL SIGNAL PROCESSING
YEAR/ SEMESTER/SECTION : II/IV/A
BRANCH : ECE

Sl. No.	Topic to be covered	Mode of Delivery	Teaching Aid	No. of Periods	Cumulative No. of Periods	Proposed Date
MODULE 1: Discrete Fourier Transforms (DFT)						
1.	Discrete Fourier Transforms (DFT): Frequency domain sampling and reconstruction of discrete time signals	L+D	BB	1	1	17/05/23
2.	The Discrete Fourier Transform	L+D	BB	1	2	18/05/23
3.	DFT as a linear transformation	L+D	BB	1	3	19/05/23
4.	Properties of DFT-Linearity and problems on same	L+D	BB	1	4	22/05/23
5.	Properties of DFT-Periodicity	L+D	BB	1	5	24/05/23
6.	Properties of DFT-Symmetry properties	L+D	BB	1	6	25/05/23
7.	Problems on symmetry properties	L+D	BB	1	7	26/05/23
8.	Properties- Multiplication of two DFTs	L+D	BB	1	8	29/05/23
9.	Problems on Multiplication properties	L+D	BB	1	9	31/05/23

10.	Circular convolution property	L+D	BB	1	10	01/06/23
11.	Problems on Circular convolution property	L+D	BB	1	11	02/06/23
12.	Problems on Circular convolution property	L+D	BB		12	05/06/23
MODULE 2: Linear Filtering methods based on the DFT						
13.	Additional DFT Properties-Circular Time, Circular frequency shift	L+D	BB	1	13	07/06/23
14.	Problems on circular time shift and circular frequency shift.	L+D	BB	1	14	08/06/23
15.	Problems on circular time shift and circular frequency shift.	L+D	BB	1	15	09/06/23
16.	Parseval's Theorem	L+D	BB	1	16	10/06/23
17.	Use of DFT in linear filtering	L+D	BB	1	17	12/06/23
18.	Filtering of long data sequences	L+D	BB	1	18	14/06/23
19.	Fast Fourier Transform Algorithms	L+D	BB	1	19	15/06/23
20.	Overlap-save problems	L+D	BB	1	20	16/06/23
21.	Overlap-add method problems	L+D		1	21	19/06/23
22.	Direct computation of DFT, need for efficient computation of the DFT (FFT algorithms)	L+D	BB	1	22	21/06/23
23.	Radix-2 FFT algorithm for the computation of DFT and IDFT- decimation-in-time and decimation-in-frequency algorithms	L+D	BB	1	23	22/06/23
24.	Problems on DIT FFT	L+D	BB	1	24	23/06/23
25.	Problems on DIF FFT	L+D	BB	1	25	30/06/23
26.	Problems on DIT,DIF FFT	L+D	BB	1	26	03/07/23
MODULE 3: Design of FIR Filters						
27.	Characteristics of practical frequency selective filters	L+D	BB	1	27	05/07/23
28.	Symmetric and Anti symmetric FIR filters	L+D	BB	1	28	06/07/23

29.	Design of low pass FIR filter using Ractangular and Hamming window	L+D	BB	1	29	07/07/23
30.	Design of low pass FIR filter using Hanning and Bartlett window	L+D	BB	1	30	08/07/23
31.	Design of high pass FIR filter using Ractangular and Hamming window	L+D	BB	1	31	10/07/23
32.	Design of high pass FIR filter using Hanning and Bartlett window	L+D	BB	1	32	12/07/23
33.	Problems on Hamming window	L+D	BB	1	33	13/07/23
34.	Problems on Hanning window	L+D	BB	1	34	14/07/23
35.	Problems on bartlett window	L+D	BB	1	35	17/07/23
36.	Structure for FIR Systems: Direct form	L+D	BB	1	36	19/07/23
37.	Cascade form structure	L+D	BB	1	37	20/07/23
38.	Lattice structures	L+D	BB	1	38	21/07/23
39.	Problems on FIR systems	L+D	BB	1	39	24/07/23
40.	Problems on cascade and lattice structure		BB	1	40	26/07/23
MODULE 4: IIR Filter Design						
41.	Infinite impulse response filter format	L+D	BB	1	41	27/07/23
42.	Bilinear transformation design method	L+D	BB	1	42	28/07/23
43.	Design of analog filters	L+D	BB	1	43	03/08/23
44.	Design of analog filters using low pass prototype transformation.	L+D	BB	1	44	04/08/23
45.	Design of Butterworth and chebyshev filters.	L+PS	BB	1	45	05/08/23
46.	Bilinear transformation	L+PS	BB	1	46	07/08/23
47.	Problems on Butterworth filters.	L+D	BB	1	47	09/08/23
48.	Problems onchebyshevfiletrs	L+PS	BB	1	48	10/08/23
49.	Problems on Impulse invariance	L+PS	BB	1	49	11/08/23
50.	Problems on Bilinear transformation	L+PS	BB	1	50	14/08/23
51.	Frequency wrapping	L+D	BB	1	51	16/08/23
52.	Realization of IIR filters in direct form I and II	L+D	BB	1	52	17/08/23
53.	Realization of IIR filters in direct form I and II	L+D	BB	1	53	18/08/23

54.	Problems on IIR Filter Structure	L+PS	BB	1	54	19/08/23
MODULE 5: Digital Signal Processors						
55.	DSP Architecture	L+D	BB	1	55	21/08/23
56.	DSP Hardware Units	L+D	BB	1	56	23/08/23
57.	Fixed point format	L+D	BB	1	57	24/08/23
58.	Problems on Fixed point format	L+D	BB	1	58	25/08/23
59.	Floating point Format	L+D	BB	1	59	28/08/23
60.	Problems on Floating point Format	L+D	BB	1	60	30/08/23
61.	IEEE Floating point formats,	L+D	BB	1	61	31/08/23
62.	Fixed point digital signal processors	L+D	BB	1	62	01/09/23
63.	Floating point processors	L+D	BB	1	63	02/09/23
64.	FIR filter implementations in Fixed point systems	L+D	BB	1	64	04/09/23
65.	IIR filter implementations in Fixed point systems	L+D	BB	1	65	11/09/23
66.	Revision of module 1,2	L+D	BB	1	66	13/09/23
67.	Revision of module 3,4	L+D	BB	1	67	14/09/23
68.	Revision of module 5	L+D	BB	1	68	15/09/23
69.	Revision of University QP	L+D	BB	1	69	16/09/23


Text Books:

1. Digital signal processing – Principles Algorithms & Applications, Proakis&Monalakis, Pearson education, 4th Edition, New Delhi, 2007.
2. Li Tan, Jean Jiang, "Digital Signal processing-Fundamentals and Applications", Academic press, 2013, ISBN:978-0-12-415893

Reference Books:

1. Sanjit K Mitra, "Digital Signal Processing, A Computer Based Approach", 4th Edition, McGraw Hill education, 2013
2. Oppenheim & Schaffer, "Discrete Time Signal Processing", PHI, 2003.
3. D. Ganesh Rao and Vineeth P Gejji, "Digital Signal processing" Cengage India Private Limited, 2017, ISBN "9386858231"


Course In-charge


Module coordinator


HOD-ECE


Principal



K. S. INSTITUTE OF TECHNOLOGY, BENGALURU - 560109
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
COURSE PLAN 2022-23 EVEN SEMESTER

COURSE INCHARGE : Dr P. N. Sudha
COURSE CODE/TITLE : 21EC43/ Circuits & Controls
YEAR/ SEMESTER/SECTION : 2nd/4th /
BRANCH : ECE

Sl. No.	Topic to be covered	Mode of Delivery	Teaching Aid	No. of Periods	Cumulative No. of Periods	Proposed Date
MODULE 1						
1	Types of Sources, Loop analysis & Problems for DC circuits	L+D	BB	1	1	17 th May 2023
2	Loop analysis & Problems for DC circuits	L+D	BB	1	2	18 th May 2023
3	Loop analysis & Problems for AC circuits	L+D	BB	2	4	18 th May 2023
4	Nodal analysis & Problems for DC circuits	L+D	BB	1	5	19 th May 2023
5	Nodal analysis & Problems for AC circuits	L+D	BB	2	7	22 nd May 2023
6	Concept of Super position theorem & Problems	L+D	BB	2	9	23 rd May 2023
7	Maximum Power transfer Theorem & Problems	L+D	BB	2	11	24 th May 2023
8	Concept of Thevenin's theorem & Problems	L+D	BB	2	13	25 th May 2023
9	Concept of Norton's Theorem & Problems	L+D	BB	2	15	25 th May 2023
10	Solving Question paper Problems & Pedagogy: Unit Test	L+D	BB	1	16	26 th May 2023
MODULE 2						
11	Two port networks: Short- circuit Admittance parameters	L+PS	BB	3	19	29 th -May 2023 to 1 st June 2023
12	Two port networks: Open- circuit Impedance parameters	L+ D	BB	2	21	1 st to 2 nd June 2023
13	Transmission parameters	L+D	BB	2	23	5 th -7 th June 2023

14	Hybrid parameters	L+D	BB	2	25	8 th June 2023
15	Laplace transform and its applications: Step Ramp, Impulse, Solution of networks using Laplace transform	L+D	BB	3	28	9 th -12 th June 2023
16	Initial value Theorem	L+D	BB	2	30	14 th -15 th June 2023
17	Final value Theorem	L+D	BB	1	31	16 th June 2023
18	Solving Question paper Problems & Pedagogy	L+D	BB	1	31	16 th June 2023
MODULE 3						
19	Types of control systems, effect of feedback systems, differential equation of physical systems	L+D	BB	4	35	22 nd -26 th June 2023
20	Introduction to block diagrams & to find transfer functions	L+D	BB	8	43	28 th June-7 th July 2023
21	Introduction to Signal Flow Graphs & to find transfer functions	L+D	BB	3	46	8 th -12 th July 2023
22	Solving Question paper Problems & Pedagogy			1	47	13 th July 2023
MODULE 4						
23	Time Response analysis: Time response of first order systems.	L+D		2	49	13 th -14 th July 2023
24	Time response of second ordersystems: Steady State Analysis	L+D	BB	3	52	17 th -20 th July 2023
25	Time response of second ordersystems: Transient Analysis	L+D	BB	5	57	21 st -27 th July 2023
26	Concepts of stability necessary condition for stability, Routh stability criterion,	L+D	BB	1	58	28 th July 2023
27	Relative stability Analysis using RH criteria	L+D	BB	4	62	3 rd -5 th August 2023
MODULE 5						
28	Introduction the root locus concepts, construction of root loci	L+D	BB	4	66	7 th -10 th Aug 2023
29	Introduction to state variable analysis: Concepts of state, state variable and state models.	L+D	BB	4	70	11 th -17 th Aug 2023
30	State model for Linear continuous -Time systems	L+D	BB	2	72	18 th -19 th Aug 2023
31	Solution of state equations.	L+D	BB	2	74	21 st -23 rd Aug 2023
32	Frequency Domain analysis and stability using Bode plot Solving Question paper Problems & Pedagogy	L+D	BB	8	82	24 th Aug - 5 th Sep 2023

Text Books:

1. Engineering circuit analysis, William H Hayt, Jr, Jack E Kemmerly, Steven M Durbin, Mc Graw Hill Education, Indian Edition 8e.
2. Networks and Systems, D Roy Choudhury, New age international Publishers, second edition.
3. Network Analysis, M E Van Valkenburg, Pearson, 3e.
4. Control Systems Engineering, I J Nagrath, M. Gopal, New age international Publishers, Fifth edition.

Reference Books:

- Control System Engineering, Nagrath & Gopal

Details for Teaching Aids:

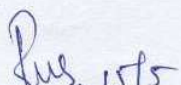
1. Black Board
2. Laptop, LCD Projector


Web links and Video Lectures (e-Resources):

- <https://nptel.ac.in/courses/108106098>
- <https://nptel.ac.in/courses/108102042>


Signature of Course In charge


Signature of Module Coordinator


Signature of HOD





KS INSTITUTE OF TECHNOLOGY BANGALORE

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

NAME OF THE STAFF : SATISH KUMAR B

SUBJECT CODE/NAME : 21EC41/COMMUNICATION THEORY

SEMESTER/YEAR/SEC : IV/ II/ A

ACADEMIC YEAR : 2022-23

SL No.	Topic to be covered	Mode of Delivery	Teaching Aid	No. of Periods	Cumulative No. of Periods	Proposed Date (B)
1	Introduction	L	BB+P	1	1	17/05/23
2	Time & Frequency Domain	L	BB+P	1	2	18/05/23
3	description, Switching modulator,	L	BB+P	1	3	22/05/23
4	Envelop detector.	L	BB+P	1	4	23/05/23
5	DOUBLE SIDE BAND-SUPPRESSED CARRIER MODULATION: Time and Frequency Domain	L	BB+P	1	5	24/05/23
6	DOUBLE SIDE BAND-SUPPRESSED CARRIER MODULATION: Time and Frequency Domain	L	BB+P	1	6	25/05/23
7	description, Ring modulator,	L	BB+P	1	7	27/05/23
8	Coherent detection,	L	BB+P	1	8	29/05/23
9	Costas Receiver, Quadrature Carrier Multiplexing	L	BB+P	1	9	30/05/23
10	SINGLE SIDE-BAND AND VESTIGIAL SIDEBAND METHODS OF MODULATION: SSB Modulation,	L	BB+P	1	10	31/05/23


11	VSB, Modulation, Frequency Translation	L	BB+P	1	11	01/06/23
12	Frequency Division Multiplexing,	L	BB+P	1	12	05/06/23
13	Example: VSB, Transmission of Analog and Digital Television.	L	BB+P	1	13.	6/06/23
MODULE 2: ANGLE MODULATION						
14	Basic definitions, Frequency Modulation:	L	BB+P	1	14	7/06/23
15	Narrow Band FM, Wide Band FM,	L	BB+P	1	15	8/06/23
16	Narrow Band FM, Wide Band FM,				16	10 /06/23
17	Transmission bandwidth of FM Signals,	L	BB+P	1	17	12/06/23
18	Transmission bandwidth of FM Signals,				18	13 /06/23
19	Generation of FM Signals, Demodulation of FM Signals,	L	BB+P	1	19	14 /06/23
20	FM, Stereo Multiplexing, Phase-Locked Loop:	L	BB+P	1	20	15/06/23
21	Nonlinear model of PLL, Linear model of PLL,	L	BB+P	1	21	22 /06/23
22	Nonlinear Effects in FM Systems.	L	BB+P	1	22	24/06/23
23	The Super heterodyne Receiver	L	BB+P	1	23	26 /06/23
MODULE 3: NOISE						
24	NOISE: Shot Noise, Thermal noise, White Noise, Noise Equivalent Bandwidth.	L	BB+P	1	24	27 /06/23
25	Noise Equivalent Bandwidth.	L	BB+P	1	25	28 /06/23
26	NOISE IN ANALOG MODULATION: Introduction, Receiver Model,	L	BB+P	1	26	6 /07/23
27	Noise in DSB-SC receivers. Noise in AM receivers, Threshold effect	L	BB+P	1	27	10/07/23
28	Noise in FM receivers, Capture effect,	L	BB+P	1	28	11/07/23
29	Noise in FM receivers, Capture effect,	L	BB+P	1	29	12/07/23
30	Capture effect, FM threshold effect,	L	BB+P	1	30	13/07/23
31	FM threshold reduction,	L	BB+P	1	31	17/07/23


11	VSB, Modulation, Frequency Translation	L	BB+P	1	11	01/06/23
12	Frequency Division Multiplexing.	L	BB+P	1	12	05/06/23
13	Example: VSB, Transmission of Analog and Digital Television.	L	BB+P	1	13.	6/06/23
MODULE 2: ANGLE MODULATION						
14	Basic definitions, Frequency Modulation:	L	BB+P	1	14	7/06/23
15	Narrow Band FM, Wide Band FM,	L	BB+P	1	15	8/06/23
16	Narrow Band FM, Wide Band FM,				16	10 /06/23
17	Transmission bandwidth of FM Signals,	L	BB+P	1	17	12/06/23
18	Transmission bandwidth of FM Signals,				18	13 /06/23
19	Generation of FM Signals, Demodulation of FM Signals,	L	BB+P	1	19	14 /06/23
20	FM, Stereo Multiplexing, Phase-Locked Loop:	L	BB+P	1	20	15/06/23
21	Nonlinear model of PLL, Linear model of PLL,	L	BB+P	1	21	22 /06/23
22	Nonlinear Effects in FM Systems.	L	BB+P	1	22	24/06/23
23	The Super heterodyne Receiver	L	BB+P	1	23	26 /06/23
MODULE 3: NOISE						
24	NOISE: Shot Noise, Thermal noise, White Noise, Noise Equivalent Bandwidth.	L	BB+P	1	24	27 /06/23
25	Noise Equivalent Bandwidth.	L	BB+P	1	25	28 /06/23
26	NOISE IN ANALOG MODULATION: Introduction, Receiver Model,	L	BB+P	1	26	6 /07/23
27	Noise in DSB-SC receivers, Noise in AM receivers, Threshold effect	L	BB+P	1	27	10/07/23
28	Noise in FM receivers, Capture effect,	L	BB+P	1	28	11/07/23
29	Noise in FM receivers, Capture effect,	L	BB+P	1	29	12/07/23
30	Capture effect, FM threshold effect,	L	BB+P	1	30	13/07/23
31	FM threshold reduction,	L	BB+P	1	31	17/07/23


32	FM threshold reduction,				32	18/07/23
33	Preemphasis and De-emphasis in FM	L	BB+P	1	33	19/07/23
34	De-emphasis in FM	L	BB+P	1	34	20/07/23
MODULE 4: SAMPLING AND QUANTIZATION						
35	Introduction, Why Digitize Analog Sources?	L	BB+P	1	35	22/07/23
36	The Low pass Sampling process Pulse Amplitude Modulation.	L	BB+P	1	36	24/07/23
37	The Low pass Sampling process Pulse Amplitude Modulation.	L	BB+P	1	37	25/07/23
38	Time Division Multiplexing	L	BB+P	1	38	26/07/23
39	Time Division Multiplexing				39	27/07/23
40	Pulse-Position Modulation	L	BB+P	1	40	3/08/23
41	Generation of PPM Waves				41	4/08/23
42	Generation of PPM Waves	L	BB+P	1	42	6/08/23
43	Detection of PPM Waves	L	BB+P	1	43	7/08/23
44	Detection of PPM Waves	L	BB+P	1	44	8/08/23
45	problems	L	BB+P	1	45	9/08/23
46	problems	L	BB+P	1	46	10/08/23
Module 5: SAMPLING AND QUANTIZATION)						
47	SAMPLING AND QUANTIZATION): The Quantization Random Process	L	BB+P	1	47	14/08/23
48	The Quantization Random Process	L	BB+P	1	48	16/08/23
49	problems	L	BB+P	1	49	17/08/23
50	Quantization Noise	L	BB+P	1	50	19/08/23
51	Quantization Noise	L	BB+P	1	51	21/08/23
52	Pulse-Code Modulation: Sampling	L	BB+P	1	52	21/08/23
53	Pulse-Code Modulation: Sampling	L	BB+P	1	53	23/08/23
54	Quantization, Encoding, Regeneration	L	BB+P	1	54	24/08/23
55	Quantization, Encoding, Regeneration	L	BB+P	1	55	28/08/23

56	Encoding, Regeneration	L	BB+P	1	56	29/08/23
57	Encoding, Regeneration	L	BB+P	1	57	30/08/23
58	Decoding, Filtering	L	BB+P	1	58	31/08/23
59	Decoding, Filtering	L	BB+P	1	59	2/09/23
60	Filtering, Multiplexing, Delta Modulation	L	BB+P	1	60	4/09/23
61	Filtering, Multiplexing, Delta Modulation	L	BB+P	1	61	5/09/23
62	Problems	L	BB+P	1	62	14/09/23
63	Problems	L	BB+P	1	63	16/09/23


Signature of Course Incharge


Signature of Module Coordinator


Signature of HOD





KS INSTITUTE OF TECHNOLOGY, BANGALORE
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

NAME OF THE STAFF : Dr. REKHA N
SUBJECT CODE/NAME : 18EC61/DIGITAL COMMUNICATION
SEMESTER/YEAR : VI-A / III
ACADEMIC YEAR : 2022-2023

Sl. No.	Topic to be covered	Mode of Delivery	Teaching Aid	No. of Periods	Cumulative No. of Periods	Proposed Date
MODULE 1: Bandpass Signal to Equivalent Low pass						
1	Bandpass Signal to Equivalent Lowpass: Introduction	L+D	BB	1	1	20/3/23
2	Hilbert Transform and problems	L+D+PS	BB	1	2	21/3/23
3	Pre-envelopes, Complex envelopes	L+D	BB	1	3	23/3/23
4	Canonical representation of bandpass signals	L+D	BB	1	4	25/3/23
5	Complex low pass representation of bandpass systems and systems	L+D	BB	1	5	27/3/23
6	Line codes: Unipolar, Polar, Bipolar, Manchester code	L+D	BB	1	6	28/3/23
7	Unipolar & their spectral densities	L+D	BB	1	7	29/3/23
8	Polar, Bipolar (AMI) & their spectral densities	L+D	BB	1	8	30/3/23
9	Manchester code & their spectral densities	L+D	BB	1	9	1/4/23
10	Overview of HDB3, B3ZS, B6ZS	L+D+PS	BB	1	10	4/4/23
MODULE 2: Signaling over AWGN Channels						
11	Signaling over AWGN Channels- Introduction	L+ D	BB	1	11	5/4/23
12	Geometric representation of signals	L+D	BB	1	12	6/4/23

13	Gram-Schmidt Orthogonalization procedure	L+D	BB	1	13	10/4/23
14	Conversion of the continuous AWGN channel into a vector channel	L+D	BB	1	14	11/4/23
15	Optimum receivers using coherent detection: ML Decoding	L+D	BB	1	15	12/4/23
16	Correlation receiver	L+D	BB	1	16	13/4/23
17	matched filter receiver	L+D	BB	1	17	15/4/23
18	Numerical Problems	L+D+PS	BB	1	18	20/4/23
MODULE 3: Digital Modulation Techniques						
19	Digital Modulation Techniques: Phase shift Keying techniques using coherent detection:	L+D	BB	1	19	24/4/23
20	generation, detection and error probabilities of BPSK	L+D	BB	1	20	25/4/23
21	generation, detection and error probabilities of QPSK	L+D	BB	1	21	26/4/23
22	Numericals		BB		22	27/4/23
23	generation, detection and error probabilities of M-ary PSK	L+D	BB	1	23	2/5/23
24	generation, detection and error probabilities of M-ary QAM	L+D	BB	1	24	3/5/23
25	Frequency shift keying techniques using Coherent detection: BFSK generation, detection and error probability	L+D	BB	1	25	4/5/23
26	M-ary PSK, M-ary QAM	L+D	BB	1	26	8/5/23
27	QPSK probability Error	L+D	BB	1	27	9/5/23
28	Non coherent orthogonal modulation techniques: BFSK & probability of error.	L+D	BB	1	28	10/5/23
29	DPSK Symbol representation, Block diagrams treatment of Transmitter and Receiver, Probability of error (without derivation of probability of error equation)	L+D	BB	1	29	11/5/23
30	Numerical Problems on Coherent Detection	L+D+PS	BB	1	30	15/5/23

	techniques					
31	Numerical Problems on BPSK,FSK	L+D+PS	BB	1	31	16/5/23
32	Numerical Problems on QPSK,DPSK	L+D+PS	BB	1	32	17/5/23
MODULE 4: Communication through Band Limited Channels						
33	Communication through Band Limited Channels: Digital Transmission through Band limited channels:	L+D	BB	1	33	18/5/23
34	Digital PAM Transmission through Band limited Channels	L+D	BB	1	34	25/5/23
35	Signal design for Band limited Channels: Design of band 5limited signals for zero ISI–The Nyquist Criterion (statement only)	L+D	BB	1	35	27/5/23
36	The Nyquist Criterion (statement only)	L+D	BB	1	36	1/6/23
37	Design of band limited signals with controlled ISI-Partial Response signals	L+D	BB	1	37	5/6/23
38	Probability of error for detection of Digital PAM: Probability of error for detection of Digital PAM with Zero ISI	L+D	BB	1	38	6/6/23
39	Symbol-by-Symbol detection of data with controlled ISI	L+D	BB	1	39	7/6/23
40	Channel Equalization: Linear Equalizers (ZFE, MMSE)	L+D	BB	1	40	8/6/23
41	Adaptive Equalizers	L+D	BB	1	41	10/6/23
42	Numerical Problems	L+D+PS	BB	1	42	12/6/23
MODULE 5: Principles of Spread Spectrum						
43	Principles of Spread Spectrum: Spread Spectrum Communication Systems: Model of a Spread Spectrum Digital Communication System,	L+D	BB	1	43	13/6/23
44	Direct Sequence Spread Spectrum Systems	L+D	BB	1	44	14/6/23
45	Effect of De-spreading on a narrowband Interference	L+D	BB	1	45	15/6/23
46	Probability of error (statement only),	L+D	BB	1	46	19/6/23
47	Some applications of DS Spread Spectrum Signals	L+D	BB	1	47	20/6/23

48	Generation of PN Sequences	L+D	BB	1	48	21/6/23
49	Frequency Hopped Spread Spectrum	L+D	BB	1	49	22/6/23
50	CDMA based on IS-95	L+D	BB	1	50	24/6/23
51	Numerical Problems on PN sequence	L+D+PS	BB	1	51	26/6/23
52	Revision of Module 1	L+D	BB	1	52	27/6/23
53	Revision of Module 2	L+D	BB	1	53	28/6/23
54	Revision of Module 3	L+D	BB	1	54	6/7/23
55	Revision of Module 4	L+D	BB	1	55	8/7/23
56	Revision of Module 5	L+D	BB	1	56	10/7/23

Text Books:

1. Simon Haykin, "Digital Communication Systems", John Wiley & sons, First Edition, 2014, ISBN 978-0-471-64735-5.
2. John G Proakis and Masoud Salehi, "Fundamentals of Communication Systems", 2014 Edition, Pearson Education, ISBN 978-8-131-70573-5.

Reference Books:

1. B.P.Lathi and Zhi Ding, "Modern Digital and Analog communication Systems", Oxford University Press, 4th Edition, 2010, ISBN: 978-0-198-07380-2.
2. Ian A Glover and Peter M Grant, "Digital Communications", Pearson Education, Third Edition, 2010, ISBN 978-0-273-71830-7.
3. John G Proakis and Masoud Salehi, "Communication Systems Engineering", 2nd Edition, Pearson Education, ISBN 978-93-325-5513-6.

WEB Materials:

- nptel.ac.in/courses/117105077/pdf-m-7/m7138.pdf
- nptel.ac.in/courses/117105077/20
- https://www.tutorialspoint.com/digital_communication/index.htm


Course In-charge
Dr. Rekha N.


Module Coordinator


Signature of HOD-ECE





5

K S INSTITUTE OF TECHNOLOGY BANGALORE
DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

COURSE PLAN

NAME OF THE STAFF : Dr. B Sudarshan

COURSE CODE/NAME : 18EC62/EMBEDDED

SYSTEMS SEMESTER/YEAR : Vi / III (A Section)


ACADEMIC YEAR : 2022-2023


SL.No	Topic to be covered	Mode of Delivery	Teaching Aid	No. of Periods	Cumulative No. of Periods	Proposed Date
MODULE 1 ARM -32 bit Microcontroller						
1	Thumb-2 technology and applications of ARM	L+D	LCD/BB	1	1	20-3-23
2	Architecture of ARM Cortex M3	L+D	LCD/BB	1	2	23-3-23
3	Various Units in the architecture	L+D	LCD/BB	1	3	24-3-23
4	Debugging support	L+D	LCD/BB	1	4	27-3-23
5	General Purpose Registers	L+D	LCD/BB	1	5	29-3-23
6	Special Registers	L+D	LCD/BB	1	6	30-3-23
7	Operation modes	L+D	LCD/BB	1	7	31-3-23
8	Exceptions, interrupts	L+D	LCD/BB	1	8	5-4-23

9	Stack operation	L+D	LCD/BB	1	9	6-4-23
10	Reset sequence	L+D	LCD/BB	1	10	10-4-23
MODULE 2 ARM cortex M3 Instruction set and Programming						
11	Assembly basics	L+D	LCD/BB	1	11	12-4-23
12	Instruction list and description	L+D	LCD/BB	1	12	13-4-23
13	Instruction list and description	L+D	LCD/BB	1	13	20-4-23
14	Thumb and ARM instructions	L+D	LCD/BB	1	14	21-4-23
15	Special instructions	L+D	LCD/BB	1	15	24-4-23
16	Useful instructions	L+D	LCD/BB	1	16	26-4-23
17	Assembly and Clanguage Programming	L+D	LCD/BB	1	17	27-4-23
18	Assembly and Clanguage Programming	L+D	LCD/BB	1	18	28-4-23
19	Assembly and Clanguage Programming	L+D	LCD/BB	1	19	29-4-23
20	CMSIS	L+D	LCD/BB	1	20	3-5-23
MODULE 3 Embedded System Components						
21	Embedded Vs General computingSystem	L+D	LCD/BB	1	21	4-5-23
22	Classification of Embedded systems,	L+D	LCD/BB	1	22	5-5-23
23	Major applications and purpose of ES, Elements of Embedded System	L+D	LCD/BB	1	23	8-5-23
24	Differences between RISC and CISC, Harvard and Princeton, Big and Little Endian formats	L+D	LCD/BB	1	24	10-5-23
25	Memory(ROM and RAM Types)	L+D	LCD/BB	1	25	11-5-23
26	Sensors, Actuators	L+D	LCD/BB	1	26	12-5-23

27	Opt coupler, Relay, Piezo buzzer, Push button switch	L+D	LCD/BB	1	27	13-5-23
28	Communication Interface (on-board and external types).	L+D	LCD/BB	1	28	15-5-23
29	I2C, SPI, IrDA	L+D	LCD/BB	1	29	17-5-23
30	Bluetooth, Zigbee and WI-FI	L+D	LCD/BB	1	30	18-5-23
MODULE 4 Embedded System Design Concepts						
31	Characteristics and Quality Attributes of Embedded Systems	L+D	LCD/BB	1	31	19-5-23
32	Operational and non-operational quality attributes	L+D	LCD/BB	1	32	25-5-23
33	Embedded Systems-Application and Domain specific	L+D	LCD/BB	1	33	26-5-23
34	Hardware software Co- design and program	L+D	LCD/BB	1	34	1-6-23
35	Hardware software Co- design and program modelling	L+D	LCD/BB	1	35	2-6-23
36	Embedded firmware design and development - Embedded firmware design Approaches	L+D	LCD/BB	1	36	5-6-23
37	Embedded firmware Development	L+D	LCD/BB	1	37	7-6-23
38	Embedded firmware Development	L+D	LCD/BB	1	38	8-6-23
39	Embedded firmware Development	L+D	LCD/BB	1	39	9-6-23
40	Embedded firmware Development	L+D	LCD/BB	1	40	10-6-23
MODULE 5 Operating Systems						
41	Operating System basics, Types of operating systems	L+D	LCD/BB	1	41	12-6-23
42	Task, process and threads	L+D	LCD/BB	1	42	14-6-23
43	Thread pre-emption, Pre-emptive Task scheduling techniques	L+D	LCD/BB	1	43	15-6-23
44	Task Communication, Task synchronization issues – Racing and Deadlock	L+D	LCD/BB	1	44	16-6-23

45	Concept of Binary and counting semaphores (Mutex example without any program).	L+D	LCD/BB	1	45	19-6-23
46	How to choose an RTOS, Integration and testing of Embedded hardware and firmware	L+D	LCD/BB	1	46	21-6-23
47	Embedded system Development Environment	L+D	LCD/BB	1	47	22-6-23
48	Block diagram (excluding Keil), Disassembler/decompiler, simulator	L+D	LCD/BB	1	48	23-6-23
49	emulator and debugging techniques	L+D	LCD/BB	1	49	30-6-23
50	emulator and debugging techniques	L+D	LCD/BB	1	50	6-7-23
51	Revision	L+D	LCD/BB	1	51	7-7-23


Course Incharge


Module coordinator


HOD


PRINCIPAL



K. S. INSTITUTE OF TECHNOLOGY BANGALORE

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

NAME OF THE STAFF : DR. CHANDA V REDDY
SUBJECT CODE/NAME : 18EC63 MICROWAVE THEORY AND ANTENNA
SEMESTER/YEAR : VI / III
ACADEMIC YEAR : 2022-2023

Sl. No.	Topic to be covered	Mode of Delivery	Teaching Aid	No. of Periods	Cumulative No. of Periods	Proposed Date
MODULE 1: Microwave Tubes						
1	Microwave Transmission Lines: Transmission Line equations and solutions with problems	L+D	BB	1	1	20/3/2023, 23/3/2023, 23/3/2023,24/3/2023
2	Reflection Coefficient and Transmission Coefficient with Problems	L+D, PS	BB	3	4	27/3/2023, 29/3/2023, 30/3/2023,
3	Standing Wave and Standing Wave Ratio,	L+ D	BB	1	5	30/3/2023,
4	Smith Chart - problems	L+D, PS	BB, PPT	2	7	31/3/2023,1/4/2023,
5	Single Stub matching – problems	L+D, PS	BB, PPT	1	8	5/4/2023,
6	Microwave Tubes: Microwave Frequencies, Microwave devices, Microwave Systems,	L+ D	BB, PPT	1	9	6/4/2023
7	Introduction Reflex Klystron oscillator	L+ D	BB, PPT	3	12	6/4/2023
8	Mechanism of Oscillations	L+ D	BB, PPT	1	13	10/4/2023
9	Modes of Oscillations, Mode Curve (Qualitative Analysis only)	L+D	BB, PPT	2	15	12/4/2023
MODULE 2: Microwave Network theory						
9	Introduction, Symmetrical Z and Y-Parameters for Reciprocal Networks	L+D, PS	BB	1	16	13/4/2023
10	S matrix representation of Multi-Port Networks	L+D	BB	2	18	13/4/2023, 15/4/2023
11	Properties and Comparison of S matrix with Z	L+D	BB	1	19	20/4/2023

	and Y matrices					
12	Microwave Passive Devices: Coaxial Connectors and Adapters	L+D	BB, PPT	1	20	20/4/2023
13	Attenuators, Phase Shifters	L+D	BB, PPT	1	21	21/4/2023
14	Waveguide Tees – E TEE	L+D	BB, PPT	1	22	24/4/2023
15	H TEE	L+D	BB, PPT	1	23	26/4/2023
116	Magic tees	L+D	BB, PPT	1	24	27/4/2023
Module 3: Strip Lines						
19	Introduction, Micro Strip lines,	L+D, PS	BB, PPT	1	25	27/4/2023
20	Parallel strip lines	L+D, PS	BB, PPT	1	26	28/4/2023
21	Coplanar strip lines, Shielded strip Lines	L+D	BB, PPT	1	27	29/4/2023
22	Antenna Basics: Introduction, Basic Antenna Parameters	L+D, PS	BB, PPT	1	28	3/5/2023
23	Patterns, Beam Area, Beam Efficiency	L+D	BB, PPT	1	29	4/5/2023
24	Radiation Intensity	L+D, PS	BB, PPT	1	30	4/5/2023
25	Directivity and Gain, Antenna Apertures	L+D, PS	BB, PPT	1	31	5/5/2023
26	Effective Height	L+D, PS	BB, PPT	1	32	8/5/2023
27	Radio Communication Link	L+D, PS	BB, PPT	1	33	10/5/2023
28	Problems	L+D, PS	BB, PPT	1	34	11/5/2023
29	Antenna Field Zones	L+D, PS	BB, PPT	2	36	11/5/2023, 12/5/2023
Module 4: Point Sources and Arrays						
30	Introduction, Point Sources	L+D	BB	1	37	13/5/2023
31	Power Patterns, Power Theorem	L+D, PS	BB	1	38	15/5/2023
32	Radiation Intensity, Field Patterns, Phase Patterns	L+D, PS	BB	1	39	17/5/2023
33	Arrays of Two Isotropic Point Sources	L+D	BB	1	40	18/5/2023
34	Pattern Multiplication	L+D, PS	BB	1	41	18/5/2023
35	Linear Arrays of n Isotropic Point Sources of equal Amplitude and Spacing	L+D, PS	BB	1	42	19/5/2023
36	Electric Dipoles: Introduction, Short Electric Dipole	L+D	BB	1	43	25/5/2023
37	Fields of a Short Dipole (General and Far Field Analyses)	L+D, PS	BB	1	44	25/5/2023
38	Radiation Resistance of a Short Dipole	L+D	BB	1	45	26/5/2023
39	Thin Linear Antenna (Field Analyses)	L+D	BB	1	46	1/6/2023
40	Radiation Resistances of Lambda/2 Antenna	L+D, PS	BB	1	47	1/6/2023

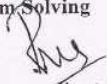
Module 5: Loop and Horn Antenna10-5(20						
41	Introduction, Small loop	L+D, PS	BB, PPT	1	48	2/6/2023
42	Comparison of Far fields of Small Loop and Short Dipole	L+D	BB, PPT	1	49	5/6/2023
43	The Loop Antenna General Case	L+D	BB, PPT	1	50	7/6/2023
44	Far field Patterns of Circular Loop Antenna with Uniform Current	L+D	BB, PPT	1	51	8/6/2023
45	Radiation Resistance of Loops	L+D, PS	BB, PPT	1	52	8/6/2023
46	Directivity of Circular Loop Antennas with Uniform Current	L+D, PS	BB, PPT	1	53	9/6/2023
47	Horn antennas: Rectangular Horn Antennas	L+D, PS	BB, PPT	1	54	10/6/2023
48	Antenna Types: Helical Antenna	L+D, PS	BB, PPT	1	55	12/6/2023
49	Helical Geometry	L+D, PS	BB, PPT	1	56	14/6/2023
50	Practical Design Considerations of Helical Antenna	L+D, PS	BB, PPT	1	57	15/6/2023
51	Yagi-Uda array	L+D	BB, PPT	1	58	15/6/2023
52	Parabola General Properties	L+D	BB, PPT	1	59	16/6/2023
53	Log Periodic Antenna	L+D	BB, PPT	1	60	19/6/2023
54	Revision Mod 1	D	BB, PPT	1	61	21/6/2023
55	Revision Mod 2	D	BB, PPT	1	62	22/6/2023
56	Revision Mod 3	D	BB, PPT	1	63	22/6/2023
57	Revision Mod 4	D	BB, PPT	1	64	23/6/2023
58	Revision Mod 5	D	BB, PPT	1	65	30/6/2023

Text Books:

1. **Microwave Engineering** – Annapurna Das, Sisir K Das, TMH, Publication, 2nd, 2010.
2. **Microwave Devices and circuits**- Samuel Y Liao, Pearson Education
3. **Antennas and Wave Propagation**- John D. Krauss, Ronald J Marhefka, Ahmad S Khan, 4th Edition, McGraw Hill Education, 2013

- Details of the teaching aids:**
1. BB – Black Board
 2. PPT Power Point Presentation
 3. PS – Problem Solving


Course Incharge


Module coordinator


HOD ECE


Principal
K.S. INSTITUTE OF TECHNOLOGY
BENGALURU - 560 109.



2

K. S. INSTITUTE OF TECHNOLOGY BANGALORE
DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING
LESSON PLAN 2022-23 EVEN SEMESTER

COURSE INCHARGE : Dr. Surekha Borra
COURSE CODE/TITLE : 18EC646/ Python Application Programming
YEAR/ SEMESTER/SECTION : 4/6 / A
BRANCH : ECE

Sl. No.	Topic to be delivered	Mode of Delivery	Teaching Aid	No. of Periods	Cumulative No. of Periods	Proposed Date
Module 1: INTRODUCTION						
1	Introduction: Why should you learn to write programs? Computer hardware architecture	L+D	BB+PPT	1	1	20/3/23
2	Terminology: Interpreter and compiler, programs, building blocks, Debugging	L+D	BB+PPT	1	2	21/3/23
3	Variables, expressions, and statements	L+D	BB+PPT	1	3	23/3/23
4	Variables, expressions, and statements	L+D	BB+PPT		4	24/3/23
5	Variables, expressions, and statements: Exercises	L+D	BB+PPT	1	5	25/3/23
6	Variables, expressions, and statements: Exercises	L+D	BB+PPT	1	6	27/3/23
7	Conditional execution	L+D	BB+PPT	1	7	28/3/23
8	Conditional execution: Exercises	L+D	BB+PPT	1	8	30/3/23
9	Functions	L+D	BB+PPT	1	9	31/3/23
10	Functions: Exercises	L+D	BB+PPT	1	10	1/4/23
Module 2: ITERATIONS						
11	Iteration	L+D	BB+PPT	1	11	4/4/23
12	Iteration: Exercises	L+D	BB+PPT	1	12	6/4/23
13	Strings	L+D	BB+PPT	1	13	10/4/23
14	Strings: Exercises	L+D	BB+PPT	1	14	11/4/23
15	Strings: Exercises	L+D	BB+PPT	1	15	13/4/23
16	Files	L+D	BB+PPT	1	16	15/4/23

17	IA-1				17	18/4/23
18	Files: Exercises	L+D	BB+PPT	1	18	20/4/23
19	Files; Exercises			1	19	21/4/23
Module 3: LISTS						
20	Lists	L+D	BB+PPT	1	20	24/4/23
21	Lists: Exercises	L+D	BB+PPT	1	21	25/4/23
22	Lists: Exercises	L+D	BB+PPT	1	22	27/4/23
23	Dictionaries	L+D	BB+PPT	1	23	28/4/23
24	Dictionaries: Exercises	L+D	BB+PPT	1	24	29/4/23
25	Dictionaries: Exercises	L+D	BB+PPT	1	25	2/5/23
26	Tuples	L+D	BB+PPT	1	26	4/5/23
27	Tuples: Exercises	L+D	BB+PPT	1	27	5/5/23
28	Regular Expressions	L+D	BB+PPT	1	28	8/5/23
29	Regular Expressions: Exercises	L+D	BB+PPT	1	29	9/5/23
Module 4: CLASSES AND OBJECTS						
30	Classes and objects	L+D	BB+PPT	1	30	11/5/23
31	Classes and objects	L+D	BB+PPT	1	31	12/5/23
32	Classes and objects: Exercises	L+D	BB+PPT	1	32	13/5/23
33	Classes and Functions	L+D	BB+PPT	1	33	15/5/23
34	Classes and Functions: Exercises	L+D	BB+PPT	1	34	16/5/23
35	Classes and Methods	L+D	BB+PPT	1	35	18/5/23
36	Classes and Methods: Exercises	L+D	BB+PPT	1	36	19/5/23
Module 5: NETWORKED PROGRAMS						
37	Networked programs	L+D	BB+PPT	1	37	22/5/23
38	Networked Programs: Exercises	L+D	BB+PPT	1	38	23/5/23
39	Using Web Services	L+D	BB+PPT	1	39	25/5/23
40	Using Web Services: Exercises	L+D	BB+PPT	1	40	26/5/23
41	Using Web Services: Exercises	L+D	BB+PPT	1	41	27/5/23
42	IA-2				42	30/5/23
43	Using databases Exercises	L+D	BB+PPT	1	43	1/6/23
44	Using databases Exercises	L+D	BB+PPT	1	44	2/6/23
45	SQL	L+D	BB+PPT	1	45	5/6/23
46	SQL Exercises	L+D	BB+PPT	1	46	6/6/23
47	Additional Exercises	L+D	BB+PPT	1	47	8/6/23

48	Additional Exercises	L+D	BB+PPT	1	48	9/6/23
49	Additional Exercises	L+D	BB+PPT	1	49	12/6/23
50	Additional Exercises	L+D	BB+PPT	1	50	13/6/23
51	Additional Exercises	L+D	BB+PPT	1	51	15/6/23
52	Additional Exercises	L+D	BB+PPT	1	52	16/6/23
53	Additional Exercises	L+D	BB+PPT	1	53	19/6/23
54	Mini-Project Presentations	L+D	BB+PPT	1	54	20/6/23
55	Mini-Project Presentations	L+D	BB+PPT	1	55	22/6/23
56	Mini-Project Presentations	L+D	BB+PPT	1	56	23/6/23
57	Mini-Project Presentations	L+D	BB+PPT	1	57	24/6/23
58	Mini-Project Presentations	L+D	BB+PPT	1	58	26/6/23
59	Mini-Project Presentations	L+D	BB+PPT	1	59	27/6/23
60	Mini-Project Presentations	L+D	BB+PPT	1	60	30/6/23
61	IA-3				61	4/7/23
62	Mini-Project Presentations	L+D	BB+PPT	1	62	6/7/23
63	Mini-Project Presentations	L+D	BB+PPT	1	63	7/7/23
64	Mini-Project Presentations	L+D	BB+PPT	1	64	10/7/23

Textbooks:

1. Charles R. Sseverance, "Python for Everybody: Exploring Data Using Python 3", 1 Edition, Create Space Independent Publishing Platform, 2016 (Chapters 1 – 13, 15).
2. Allen B. Do ey, "Think Python: How to Think Like a Computer Scientist", 2n Edition, Green Tea Press, 2015 (Chapters 15,16,17)

Reference Books:

1. Mark Lutz, "Programming Python", 4th Edition, O'Reilly Media, 2011. ISBN-13: 978-9350232873.
2. Wesley J Chun, "Core Python Applications Programming", 3rd Edition, Pearson Education India, 2015. ISBN—13: 978—9332555365.
3. Reema Thareja, "Python Programming using problem solving approach", Oxford university press, 2017

Web Materials:

- W1: <https://nptel.ac.in/courses/106106145/>
W2: <https://nptel.ac.in/courses/117106113/34>
W3: <https://nptel.ac.in/courses/106105166/26>

Details of the teaching aids:

Black Board and Power Point Presentations, Python IDE, Jupyter Notebook


Course Incharge


Module Coordinator


HOD/CE


PRINCIPAL



K S INSTITUTE OF TECHNOLOGY BANGALORE
DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

NAME OF THE STAFF : BHARGAVI ANANTH
SUBJECT CODE/NAME : 18ME653/SUPPLY CHAIN MANAGEMENT
SEMESTER/YEAR/SEC : VI / III/A&B
ACADEMIC YEAR : 2022-23

Sl. No.	Topic to be covered	Mode of Delivery	Teaching Aid	No. of Periods	Cumulative No. of Periods	Proposed Date
MODULE 1: Introduction: Supply Chain						
1	Fundamental	L	P	1	1	20/3/23
2	Evolution	L	P	1	2	21/3/23
3	Role in Economy	L	P	1	3	24/3/23
4	Importance	L	P	1	4	27/3/23
5	Decision Phases	L	P	1	5	28/3/23
6	Supplier Manufacturer Customer Chain	L	P	1	6	29/3/23
7	Enablers/Drivers of supply chain performance	L	P	1	7	31/3/23
8	supply chain strategy	L	P	1	8	1/4/23
9	supply chain performance measures	L	P	1	9	4/4/23
10	Case Study	L	P	1	10	5/4/23
11	Examples	L	P	1	11	10/4/23
MODULE 2: Strategic Sourcing Outsourcing						

12	Strategic Sourcing - Introduction	L	P	I	12	11/4/23
13	Make vs Buy	L	P	I	13	12/4/23
14	Identifying Core processes	L	P	I	14	15/4/23
15	Market vs Hierarchy	L	P	I	15	21/4/23
16	Make vs Buy continuum	L	P	I	16	24/4/23
17	sourcing strategy	L	P	I	17	25/4/23
18	supplier selection and contract negotiation	L	P	I	18	26/4/23
19	creating a world class supply base	L	P	I	19	28/4/23
20	supplier development	L	P	I	20	29/4/23
21	world wide sourcing.	L	P	I	21	2/5/23
22	Case Study	L	P	I	22	3/5/23
Module 3: Warehouse Management and Supply Chain Distribution Network Design						
23	Warehouse management Stores management – Introduction	L	P	I	23	5/5/23
24	stores systems and procedures	L	P	I	24	8/5/23
25	incoming materials control – stores accounting and stock verification obsolete	L	P	I	25	9/5/23
26	surplus and scrap value analysis	L	P	I	26	10/5/23
27	material handling transportation and traffic management	L	P	I	27	12/5/23
28	operational efficiency	L	P	I	28	13/5/23
29	productivity – cost effectiveness	L	P	I	29	15/5/23
30	performance measurement	L	P	I	30	16/5/23
31	Supply Chain Network Distribution Network Design – Role – factors influencing options	L	P	I	31	17/5/23
32	value addition – distribution strategies	L	P	I	32	19/5/23
33	models for facility location and capacity allocation. Distribution Centre Location Models	L	P	I	33	22/5/23
Module 4: Supply Chain Network Optimization Models						
34	Supply Chain Network Optimization Models – Introduction	L	P	I	34	23/5/23

35	Impact of Uncertainty on Network Design	L	P	1	35	24/5/23
36	Network Design decisions using decision tree	L	P	1	36	26/5/23
37	Network Design decisions using decision tree	L	P	1	37	27/5/23
38	Planning demand	L	P	1	38	27/4/23
39	multiple item	L	P	1	39	1/6/23
40	multiple location inventory management	L	P	1	40	5/6/23
41	pricing management	L	P	1	41	6/6/23
42	Revenue management	L	P	1	42	7/6/23
43	Case Study	L	P	1	43	9/6/23
44	Examples	L	P	1	44	10/6/23
MODULE 5: Current Trends in Supply Chain Integration						
45	Current Trends - Introduction	L	P	1	45	12/6/23
46	Supply Chain Integration	L	P	1	46	13/6/23
47	Building partnership and trust in supply chain.	L	P	1	47	14/6/23
48	Value of information: Bullwhip effect	L	P	1	48	16/6/23
49	Effective Forecasting – coordinating the supply chain.	L	P	1	49	19/6/23
50	Supply Chain restructuring	L	P	1	50	20/6/23
51	supply chain mapping – supply chain process restructuring	L	P	1	51	21/6/23
52	postpone the point of differentiation	L	P	1	52	23/6/23
53	IT in Supply Chain – Agile Supply Chains	L	P	1	53	24/6/23
54	Reverse Supply chain. Future of IT in supply chain	L	P	1	54	30/6/23
55	E-business in supply chain	L	P	1	55	7/7/23



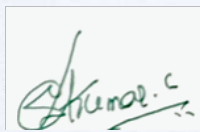
Signature of Course Incharge



Signature of Module Coordinator



Signature of HOD/ECE





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K. S. INSTITUTE OF TECHNOLOGY, BENGALURU - 560109
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
COURSE PLAN 2022-23 EVEN SEMESTER

COURSE INCHARGE : Mrs.V.SANGEETHA
COURSE CODE/TITLE : 18EC81/Wireless and Cellular communication
YEAR/ SEMESTER/SECTION : IV/VIII/A
BRANCH : ECE

Sl. No.	Topic to be covered	Mode of Delivery	Teaching Aid	No. of Periods	Cumulative No. of Periods	Proposed Date
MODULE 1: Mobile Radio Propagation						
1	Mobile Radio Propagation – Large Scale Path Loss – Free Space Propagation Model	L+D	BB	1	1	13.02.2023
2	Relating Power to Electric Field, Three Basic Propagation Mechanisms – Reflection (Ground Reflection), Diffraction, Scattering	L+D	BB	1	2	13.02.2023
3	Practical Link Budget, Fading and Multipath – Broadband wireless channel	L+D	BB	1	3	14.02.2023
4	Delay Spread and Coherence Bandwidth, Doppler Spread and Coherence Time	L+D	BB	1	4	14.02.2023
5	Angular spread and Coherence	L+D,AV	BB,LCD	1	5	20.02.2023
6	Distance Statistical Channel Model of a Broadband Fading Channel	L+D	BB	1	6	20.02.2023
7	The Cellular Concept – Cellular Concept	L+D,AV	BB,LCD	1	7	21.02.2023
8	Analysis of Cellular Systems	L+D	BB	1	8	21.02.2023
9	Sectoring	L+D	BB	1	9	27.02.2023
10	Problems	L+PS	BB	1	10	27.02.2023

MODULE 2: GSM and TDMA Technology						
11	GSM System overview – Introduction	L+ D	BB	1	11	28.02.2023
12	GSM Channel Concept	L+D	BB	1	12	28.02.2023
13	GSM Channel Concept	L+D	BB	1	13	06.03.2023
14	GSM System Operations	L+AV	LCD	1	14	06.03.2023
15	GSM System Operations	L+D	BB	1	15	07.03.2023
16	GSM Identities	L+D	BB	1	16	07.03.2023
17	Internal Assessment-1			1	17	13.03.2023
18	Infrastructure Communications (Um Interface)	L+D	BB	1	18	14.03.2023
19	Network and System Architecture	L+D	BB	1	19	14.03.2023
20	GSM System Operations	L+AV	LCD	1	20	20.03.2023
21	Traffic cases, GSM	L+AV	LCD	1	21	20.03.2023
MODULE 3: CDMA Technology						
22	CDMA System Over view- Introduction	L+AV	LCD	1	22	21.03.2023
23	CDMA Network and system Architecture	L+D	BB	1	23	21.03.2023
24	CDMA Basics	L+AV	LCD	1	24	27.03.2023
25	CDMA Basics	L+D	BB	1	25	27.03.2023
26	CDMA Channel Concepts	L+D	BB	1	26	28.03.2023
27	CDMA Channel Concepts	L+D	BB	1	27	28.03.2023
28	CDMA System(Layer 3)operations 3G CDMA	L+D	BB	1	28	04.04.2023
MODULE 4: LTE – 4G						
29	Key Enablers for LTE 4G – OFDM	L+D	BB	1	29	04.04.2023
30	SC-FDE, SC-FDMA	L+AV	LCD	1	30	10.04.2023
31	Channel Dependent Multiuser Resource Scheduling	L+D	LCD, BB	1	31	10.04.2023
32	Multi-Antenna Techniques, Flat IP Architecture	L+AV	LCD	1	32	11.04.2023
33	LTE Network Architecture	L+D	BB	1	33	11.04.2023
34	Internal Assessment-2				34	17.04.2023
35	Multi-Carrier Modulation – Multicarrier concepts	L+D	BB	1	35	24.04.2023
36	OFDM Basics, OFDM in LTE	L+D	BB	1	36	24.04.2023
37	Timing and Frequency Synchronization	L+D	BB	1	37	25.04.2023
38	Peak to Average Ration	L+D	BB	1	38	25.04.2023
39	SC-Frequency Domain Equalization, Computational Complexity Advantage of OFDM and SC-FDE	L+D	BB	1	39	02.05.2023

MODULE 5: LTE – 4G						
40	LTE – 4G OFDMA and SC-FDMA , Multiple Access for OFDM Systems, OFDMA, SCFDMA	L+AV,D	LCD,BB	1	40	02.05.2023
41	Multiuser Diversity and Opportunistic Scheduling. OFDMA and SC-FDMA in LTE, OFDMA system Design Considerations,	L+AV	LCD	1	41	08.05.2023
42	The LTE Standard – Introduction to LTE	L+AV	LCD	1	42	08.05.2023
43	Hierarchical Channel Structure of LTE	L+AV,D	LCD,BB	1	43	09.05.2023
44	Downlink OFDMA Radio Resources, Uplink SC-FDMA Radio Resources	L+D	BB	1	44	09.05.2023
45	Internal Assessment-3			1	45	11.05.2023

Text Books:

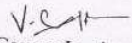
1. Fundamentals of LTE Arunabha Ghosh, Jan Zhang, Jefferey Andrews, Riaz Mohammed, Pearson education (Formerly Prentice Hall, Communications Engg and Emerging Technologies), ISBN-13: 978-0-13-703311-9.
2. Introduction to Wireless Telecommunications Systems and Networks, Gary Mullet, First Edition, Cengage Learning India Pvt Ltd., 2006, ISBN – 13: 978-81-315-0559-5.

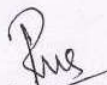
Reference Books:


1. "Wireless Communications: Principles and Practice" Theodore Rappaport, 2nd Edition ,Prentice Hall Communications Engineering and Emerging Technologies Series, 2002, ISBN 0-13-042232-0.
2. LTE for UMTS Evolution to LTE –Advanced ' Harri Holma and Antii Toskala, Second Edition-2011, John Wiley & Sons, Ltd. Print ISBN:9780470660003.2

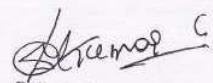
Details for Teaching Aids:

1. Black Board
2. Laptop, LCD Projector


Course In-charge


Module coordinator


HOD-ECE
HEAD OF THE DEPARTMENT
Dept. of Electronics & Communication Engg
K.S. Institute of Technology
Bengaluru - 560 109


Principal
PRINCIPAL
K.S. INSTITUTE OF TECHNOLOGY
BENGALURU - 560 109.



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K S INSTITUTE OF TECHNOLOGY BANGALORE
DEPARTMENT OF ELECTONICS AND COMMUNICATION ENGINEERING

COURSE PLAN EVEN SEM-2022-23

NAME OF THE STAFF : Mr. Saleem S Tevaramani
SUBJECT CODE/NAME : 18EC823/ RADAR ENGINEERING
SEMESTER/SEC : VIII /A
ACADEMIC YEAR : 2022-2023

Sl No.	Topic to be covered	Mode of Delivery	Teaching Aid	No. of Periods	Cumulative No. of Periods	Proposed Date
Module -1: Basics of Radar & Simple form of Radar Equation						
1	Basics of Radar: Introduction, Maximum Unambiguous Range	L+AV	LCD	1	1	13/02/2023
2	Radar Waveforms, Definitions' w.r.t pulse waveforms- PRF, PRI, Duty Cycle,	L+ D	LCD +BB	1	2	13/02/2023
3	Peak Transmitter Power, Average Transmitter Power	L+ D	LCD +BB	1	3	14/02/2023
4	Simple form of Radar Equation	L+D	LCD +BB	1	4	14/02/2023
5	Radar Block Diagram & Operation	L+D	LCD +BB	1	5	20/02/2023
6	Radar Frequencies	L+D	LCD +BB	1	6	20/02/2023
7	Applications of Radar, The Origins of Radar	L+D	LCD +BB	1	7	21/02/2023
8	Problems	L+D	LCD +BB	1	8	21/02/2023
9	Problems	L+D	LCD +BB	1	9	27/02/2023
Module -2: The Radar Equation & Radar Cross Section of Targets						
10	Prediction of Radar Range Performance	L+ D	LCD +BB	1	10	27/02/2023
11	Detection of signal in Noise, Minimum Detectable Signal, Receiver Noise, SNR	L+D	LCD +BB	1	11	28/02/2023

12	Modified Radar Range Equation	L+D, PS	LCD +BB	1	12	28/02/2023
13	Envelope Detector – False Alarm Time & Probability, probability of detection	L+D, PS	LCD +BB	1	13	06/03/2023
14	Radar Cross Section	L+D, PS	LCD +BB	1	14	06/03/2023
15	Simple Targets- sphere, cone sphere	L+D, PS	LCD +BB	1	15	07/03/2023
16	Transmitter Power, PRF & Range Ambiguities	L+D, PS	LCD +BB	1	16	07/03/2023
17	System Losses	L+D	LCD +BB	1	17	20/03/2023
18	Problems	L+D	LCD +BB	1	18	20/03/2023
Module -3: MTI & Pulse Doppler Radar & Digital MTI Processing						
19	Introduction, Principle, Doppler Frequency Shift	L+D	LCD +BB	1	19	21/03/2023
20	Simple CW Radar, sweep to sweep subtraction Delay Line Canceler	L+D	LCD +BB	1	20	21/03/2023
21	MTI Radar with Power amplifier transmitter, Delay line canceler	L+D	LCD +BB	1	21	27/03/2023
22	Frequency Response of single delay line, blind speeds, clutter attenuation	L+D	LCD +BB	1	22	27/03/2023
23	MTI improvement factor	L+D	LCD +BB	1	23	28/03/2023
24	N pulse delay line canceler	L+D	LCD +BB	1	24	28/03/2023
25	Digital MTI Processing: Blind Phases, I & Q channels,	L+D	LCD +BB	1	25	04/04/2023
26	Digital MTI Doppler signal Processor	L+D	LCD +BB	1	26	04/04/2023
27	Moving Target Detector, Original MTD	L+D	LCD +BB	1	27	10/04/2023
Module -4: Tracking Radar & Sequential Lobing						
28	Types of Radar tracking systems	L+AV	LCD +BB	1	28	10/04/2023
29	Monopulse tracking- Amplitude Comparison Monopulse (1D)	L+D	LCD +BB	1	29	11/04/2023
30	Monopulse (2D)	L+D	LCD +BB	1	30	11/04/2023
31	Phase comparison Monopulse	L+D	LCD +BB	1	31	24/04/2023
32	Sequential Lobing	L+D	LCD +BB	1	32	24/04/2023
33	Conical Scan Tracking Radar	L+D	LCD +BB	1	33	25/04/2023
34	Tracking in Range, Comparison of trackers	L+D	LCD +BB	1	34	25/04/2023
Module -5: Radar Antenna & Radar Receiver						


35	Functions of the Radar Antenna	L+AV	LCD +BB	1	35	02/05/2023
36	Antenna Parameters	L+D	LCD +BB	1	36	02/05/2023
37	Electronically steered phased array antennas	L+D	LCD +BB	1	37	08/05/2023
38	The Radar Receiver, Receiver Noise Figure	L+D	LCD +BB	1	38	08/05/2023
39	Superheterodyne receiver, Duplexers	L+D	LCD +BB	1	39	09/05/2023
40	Receivers Protectors	L+D	LCD +BB	1	40	09/05/2023
41	Question Paper discussion	L+D	LCD +BB	1	41	13/05/2023

Text Book:

Introduction to Radar Systems- Merrill I Skolink, 3e, TMH, 2001

Reference Books:

1. Radar Principles, Technology, Applications – Byron Edde Pearson Education, 2004.
2. Radar Principles – Peebles, Jr. P.Z. Wiley, New York, 1998
3. Principles of Modern Radar: Basic Principles -Mark A. Rkhards, James A. Scheer, William A, Holm. Yesdee, 2013


Course In charge


Module Coordinator


HOD-ECE

