TENTATIVE LESSON PLAN: R1622041

Course Title: Electronic Circuit Analysis (R1622041)		
Section : Sec A	**Date : 18 - 11 - 2019**	**Page No : 01 of 03**
Revision No : 00	**Prepared By : B. Ravi**	**Approved By : HOD**

Tools: Black Board

No. of Periods	TOPIC	Date	Mode of Delivery
	UNIT-I Small Signal High Frequency Transistor Amplifier models		
	CO1: Able to and analysis of small signal high frequency transistor amplifier using BJT and FET **T1:** Integrated Electronics- J. Millman, C. Halkias, Tata Mc-Graw Hill, Second Edition. **T2:** Electronic Circuit Analysis- S. Salivahanan, N. Suresh Kumar, Tata Mc-Graw Hill, Second Edition		
1	Transistor at high frequencies	**From: 18-11-19** **To: 07-12-19**	Lecture Interspersed With discussions
2	Hybrid- π common emitter transistor model		
3	Hybrid π conductance's		
4	Hybrid π capacitances		
5	Validity of hybrid π model		
6	CE short circuit current gain		
7	Current gain with resistive load		
8	Frequency response		
9	Gain bandwidth product.		
10	Analysis of common Source and common drain Amplifier circuits at high frequencies		
11	Problems and tutorial class		
	UNIT-II Multi Stage Amplifiers		
	CO2: Able to Design and analysis of multi stage amplifiers using BJT and FET and Differential amplifier using BJT **T1:** Integrated Electronics- J. Millman, C. Halkias, Tata Mc-Graw Hill, Second Edition. **T2:** Electronic Circuit Analysis- S. Salivahanan, N. Suresh Kumar, Tata Mc-Graw Hill, Second Edition		
12	Classification of amplifiers	**From: 9-12-19** **To: 27-12-19**	Lecture interspersed with discussions
13	Cascaded transistor amplifier and its analysis		
14	Analysis of two stage RC coupled amplifier		
15	Darlington pair amplifier		
16	Boot-strap emitter follower		
17	Cascode amplifier		
18	Differential amplifier using BJT		
19	Analysis of multi stage amplifiers using FET		

No. of Periods	TOPIC	Date	Mode of Delivery
	UNIT-III Feedback Amplifiers **CO3:** Able to Design and analysis of feedback amplifiers using BJT **T1:** Integrated Electronics- J. Millman, C. Halkias, Tata Mc-Graw Hill, Second Edition. **T2:** Electronic Circuit Analysis- S. Salivahanan, N. Suresh Kumar, Tata Mc-Graw Hill, Second Edition		
20	Classification of amplifiers	**From: 30-12-19** **To: 07-01-20**	Lecture interspersed with discussions
21	Feedback principle and concept		
22	Characteristics of negative feedback amplifiers		
23	Feedback topologies		
24	Effect of feedback on i/p impedance		
25	Effect of feedback on o/p impedance		
26	Generalized analysis of feedback amplifiers		
27	Method of analysis of FB amplifiers		
28	Method of analysis of FB amplifiers		
29	Problems		
	UNIT-IV Oscillators **CO4:** Able to Derive the expressions for frequency of oscillation and condition for oscillation of RC and LC oscillators **T1:** Integrated Electronics- J. Millman, C. Halkias, Tata Mc-Graw Hill, Second Edition. **T2:** Electronic Circuit Analysis- S. Salivahanan, N. Suresh Kumar, Tata Mc-Graw Hill, Second Edition		
30	Condition for oscillations	**From: 31-01-20** **To: 07-02-20**	Lecture interspersed with discussions
31	RC-phase shift oscillator with BJT		
32	RC-phase shift oscillator with FET		
33	Wein bridge oscillator		
34	Generalized analysis of LC Oscillators		
35	Hartley oscillator		
36	Colpitt's oscillator		
37	Hartley oscillator with JFET		
38	Colpitt's oscillator with JFET		
39	Crystal oscillator		
40	Frequency and amplitude stability		
	UNIT-V Power Amplifiers **CO5:** Know the classification of the power amplifier and their analysis with performance comparison. **T1:** Integrated Electronics- J. Millman, C. Halkias, Tata Mc-Graw Hill, Second Edition. **T2:** Electronic Circuit Analysis- S. Salivahanan, N. Suresh Kumar, Tata Mc-Graw Hill, Second Edition		
41	Classification of amplifiers	**From: 08-02-20**	Lecture interspersed with discussions
42	Efficiency		
43	Class A power Amplifiers and their analysis		
44	Harmonic Distortions		
45	Class A push pull power Amplifiers		
46	Class B Push-pull amplifiers and their analysis		

47	Complementary symmetry push pull amplifier		
48	Cross over Distortion	To: 26-02-20	Lecture interspersed with discussions
49	Class -C power amplifier		
50	Class -D power amplifier		
51	Class AB power amplifier		
52	Thermal stability and Heat sinks		
53	problems		
UNIT-VI Tuned Amplifiers **CO6:** Know the classification of the tuned amplifiers and their analysis **T1:** Integrated Electronics- J. Millman, C. Halkias, Tata Mc-Graw Hill, Second Edition. **T2:** Electronic Circuit Analysis- S. Salivahanan, N. Suresh Kumar, Tata Mc-Graw Hill, Second Edition			
54	Q-Factor,	From: 28-02-20	Lecture interspersed with discussions
55	Capacitance single tuned amplifier		
56	Double tuned amplifiers		
57	Effect of cascading single tuned amplifiers on band width		
58	Effect of cascading double tuned amplifiers on band width		
59	staggered tuned amplifiers	To: 18-03-19	
60	Stability of tuned amplifiers		
61	Wideband amplifiers.		

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Date: 18-11-19

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Date: 18/11/19

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TENTATIVE LESSON PLAN: R1622041

Course Title: Electronic Circuit Analysis (R1622041)		
Section : Sec B	**Date : 18 - 11 - 2019**	**Page No : 01 of 03**
Revision No : 00	**Prepared By : B. Ravi**	**Approved By : HOD**

Tools: Black Board

No. of Periods	TOPIC	Date	Mode of Delivery
	UNIT-I Small Signal High Frequency Transistor Amplifier models		
	CO1: Able to and analysis of small signal high frequency transistor amplifier using BJT and FET **T1:** Integrated Electronics- J. Millman, C. Halkias, Tata Mc-Graw Hill, Second Edition. **T2:** Electronic Circuit Analysis- S. Salivahanan, N. Suresh Kumar, Tata Mc-Graw Hill, Second Edition		
1	Transistor at high frequencies	**From: 18-11-19** **To: 09-12-19**	Lecture Interspersed With discussions
2	Hybrid- π common emitter transistor model		
3	Hybrid π conductance's		
4	Hybrid π capacitances		
5	Validity of hybrid π model		
6	CE short circuit current gain		
7	Current gain with resistive load		
8	Frequency response		
9	Gain bandwidth product.		
10	Analysis of common Source and common drain Amplifier circuits at high frequencies		
11	Problems and tutorial class		
	UNIT-II Multi Stage Amplifiers		
	CO2: Able to Design and analysis of multi stage amplifiers using BJT and FET and Differential amplifier using BJT **T1:** Integrated Electronics- J. Millman, C. Halkias, Tata Mc-Graw Hill, Second Edition. **T2:** Electronic Circuit Analysis- S. Salivahanan, N. Suresh Kumar, Tata Mc-Graw Hill, Second Edition		
12	Classification of amplifiers	**From: 10-12-19** **To: 24-12-19**	Lecture interspersed with discussions
13	Cascaded transistor amplifier and its analysis		
14	Analysis of two stage RC coupled amplifier		
15	Darlington pair amplifier		
16	Boot-strap emitter follower		
17	Cascode amplifier		
18	Differential amplifier using BJT		
19	Analysis of multi stage amplifiers using FET		

No. of Periods	TOPIC	Date	Mode of Delivery
	UNIT-III Feedback Amplifiers **CO3:** Able to Design and analysis of feedback amplifiers using BJT **T1:** Integrated Electronics- J. Millman, C. Halkias, Tata Mc-Graw Hill, Second Edition. **T2:** Electronic Circuit Analysis- S. Salivahanan, N. Suresh Kumar, Tata Mc-Graw Hill, Second Edition		
20	Classification of amplifiers	**From: 26-12-19** **To: 09-01-20**	Lecture interspersed with discussions
21	Feedback principle and concept		
22	Characteristics of negative feedback amplifiers		
23	Feedback topologies		
24	Effect of feedback on i/p impedance		
25	Effect of feedback on o/p impedance		
26	Generalized analysis of feedback amplifiers		
27	Method of analysis of FB amplifiers		
28	Method of analysis of FB amplifiers		
29	Problems		
	UNIT-IV Oscillators **CO4:** Able to Derive the expressions for frequency of oscillation and condition for oscillation of RC and LC oscillators **T1:** Integrated Electronics- J. Millman, C. Halkias, Tata Mc-Graw Hill, Second Edition. **T2:** Electronic Circuit Analysis- S. Salivahanan, N. Suresh Kumar, Tata Mc-Graw Hill, Second Edition		
30	Condition for oscillations	**From: 27-01-20** **To: 05-02-19**	Lecture interspersed with discussions
31	RC-phase shift oscillator with BJT		
32	RC-phase shift oscillator with FET		
33	Wein bridge oscillator		
34	Generalized analysis of LC Oscillators		
35	Hartley oscillator		
36	Colpitt's oscillator		
37	Hartley oscillator with JFET		
38	Colpitt's oscillator with JFET		
39	Crystal oscillator		
40	Frequency and amplitude stability		
	UNIT-V Power Amplifiers **CO5:** Know the classification of the power amplifier and their analysis with performance comparison. **T1:** Integrated Electronics- J. Millman, C. Halkias, Tata Mc-Graw Hill, Second Edition. **T2:** Electronic Circuit Analysis- S. Salivahanan, N. Suresh Kumar, Tata Mc-Graw Hill, Second Edition		
41	Classification of amplifiers	**From: 06-02-20**	Lecture interspersed with discussions
42	Efficiency		
43	Class A power Amplifiers and their analysis		
44	Harmonic Distortions		
45	Class A push pull power Amplifiers		
46	Class B Push-pull amplifiers and their analysis		
47	Complementary symmetry push pull amplifier		

48	Cross over Distortion	To: 25-02-20	Lecture interspersed with discussions
49	Class -C power amplifier		
50	Class -D power amplifier		
51	Class AB power amplifier		
52	Thermal stability and Heat sinks		
53	problems		
UNIT-VI Tuned Amplifiers **CO6:** Know the classification of the tuned amplifiers and their analysis **T1:** Integrated Electronics- J. Millman, C. Halkias, Tata Mc-Graw Hill, Second Edition. **T2:** Electronic Circuit Analysis- S. Salivahanan, N. Suresh Kumar, Tata Mc-Graw Hill, Second Edition			
54	Q-Factor,	From: 25-02-20 To: 18-03-20	Lecture interspersed with discussions
55	Capacitance single tuned amplifier		
56	Double tuned amplifiers		
57	Effect of cascading single tuned amplifiers on band width		
58	Effect of cascading double tuned amplifiers on band width		
59	staggered tuned amplifiers		
60	Stability of tuned amplifiers		
61	Wideband amplifiers.		

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S-Sri Gow

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Date: 18/11/19

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TENTATIVE PLAN: R1622042

Course Title: CONTROL SYSTEMS (R1622042)		
Section : A	Date : 18.11.2020	Page No : 01 of 03
Revision No : 00	Prepared By : A.V.P.Sarvari	Approved By : HOD

Tools : Black board, PPTs, Moodle

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT –I INTRODUCTION			
CO1: Understanding the concept of control systems, Representing Mechanical and Electrical Systems using Differential Equations and introduces the concepts of feedback and its advantages to various control systems.			
TB: I.J.Nagarath and M.Gopal, " Control System Engineering," New Age International Publishers, Fifth Edition			
1.	**Introduction**	**From: 18.11.2019 To: 6.12.2019**	Lecture interspersed with discussions
2.	System Control System		
3.	Open Loop Control System		
4.	Closed loop Control System		
5,6.	Different Examples		
7.	**Mathematical models of Physical Systems**		
8,9,10.	Transfer functions		
11,12.	Differential equations of physical systems		
13to18.	Block diagram Algebra		
19.	Signal flow graphs with illustrative examples		
20.	**Effects of Feedback**		
21.	Feedback Characteristics and its advantages		
	Linearizing effect of feedback		
UNIT-II CONTROLLER COMPONENTS & TIME RESPONSE ANALYSIS			
CO2: Obtaining Transfer Function of a servo motor and the performance metrics to design the control system in time-domain.			
TB:I.J.Nagarath and M.Gopal, " Control System Engineering," New Age International Publishers, Fifth Edition			
	Controller Components		
22.	DC Servomotor (Armature Controlled and Field Controlled) with necessary derivation for transfer function	**From: 9.12.2019 To: 21.12.2019**	Lecture interspersed with discussions
23.	AC Servomotor and its transfer function		
24.	AC Tachometer		
	Potentiometer		
25.	Synchros		
	AC Position Control Systems		
26.	**Time Response Analysis**		
27.	Standard test Signals		
28 to 31.	Time response of first and second order systems		

TENTATIVE PLAN: R1622042

Course Title: CONTROL SYSTEMS (R1622042)		
Section : A	Date : 18.11.2020	Page No : 02 of 03
Revision No : 00	Prepared By : A.V.P.Sarvari	Approved By : HOD

Tools : Black board, PPTs

No. of Periods	TOPIC	Date	Mode of Delivery
32.	steady state errors and error constants	From: 9.12.2019 To: 21.12.2019	Lecture interspersed with discussions
33.	Effect of adding a zero to a system		
34.	Design specifications of second order systems		
35.	Performance indices		
UNIT-III CONCEPTS OF STABILITY & ROOT LOCUS TECHNIQUE **CO3: Obtaining the location of roots of linear differential equations having real coefficients and commenting on stability. Locating roots in S-Domain and finding critical value of open-loop gain K for stability of system.** **TB:I.J.Nagarath and M.Gopal, " Control System Engineering," New Age International Publishers, Fifth Edition**			
	Concepts of Stability and Algebraic Criteria		Lecture interspersed with discussions
36.	The concept of Stability	From: 23.12.2019 To: 10.1.2020	
37.	Necessary Conditions for Stability		
38.	**Routh-Hurwitz Srability Criterion**		
39.	Relative stability analysis		
40.	The Root Locus Technique Introduction		
41.	The Root Locus concepts		
42.	Construction of Root Loci		
43.	**Tutorial**		
UNIT-IV FREQUENCY RESPONSE ANALYSIS **CO4: Analyzing the stability of the system in frequency domain and obtaining frequency domain specifications.** **TB:I.J.Nagarath and M.Gopal, " Control System Engineering," New Age International Publishers, Fifth Edition**			
44.	**Frequency response analysis**	From: 24.1.2020 To: 15.2.2020	Lecture interspersed with discussions
45.	Introduction		
46.	Correlation between time and frequency response		
47 to 51.	Polar Plots		
52to57.	Bode Plots		
58to67.	Nyquist Stability Criterion		
68,69.	**Tutorial**		

TENTATIVE PLAN: R1622042

Course Title: CONTROL SYSTEMS (R1622042)		
Section : A	Date : 18.11.2020	Page No : 03 of 03
Revision No : 00	Prepared By : A.V.P.Sarvari	Approved By : HOD

Tools : Black board, PPTs

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-V INTRODUCTION TO DESIGN **CO5: Compensating system performance using Lag, Lead and Lag-lead controllers and Analyzing the effect of proportionality controllers.** **TB:I.J.Nagarath and M.Gopal, " Control System Engineering," New Age International Publishers, Fifth Edition**			
70.	**Introduction to Design**	**From: 17.2.2020** **To: 7.3.2020**	Lecture interspersed with discussions
71.	The design problem		
72.	Preliminary consideration of classical design		
73to76.	Realization of basic Compensators		
77.	Cascade compensation in time domain and frequency domain		
78.	Tuning of PID Controllers		
79.	**Tutorial**		
UNIT-VI STATE VARIABLE ANALYSIS AND DESIGN **CO6:Representing a control system using state equations.** **TB:I.J.Nagarath and M.Gopal, " Control System Engineering," New Age International Publishers, Fifth Edition**			
	State Variable Analysis and Design		Lecture interspersed with discussions
80.	Introduction	**From: 9.3.2020** **To: 23.3.2020**	
81.	Concepts of State		
	State Variables and State models		
82.	State models for linear continuous-time systems		
83.	State variables and linear discrete-time systems		
84,85,86.	Solution of state equations and Concepts of Controllability and Observability		
87.	**Tutorial**		

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TENTATIVE PLAN: R1622042

Course Title: CONTROL SYSTEMS (R1622042)		
Section : B	Date : 18.11.2020	Page No : 01 of 03
Revision No : 00	Prepared By : A.V.P.Sarvari	Approved By : HOD

Tools : Black board, PPTs, Moodle

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT –I INTRODUCTION **CO1: Understanding the concept of control systems, Representing Mechanical and Electrical Systems using Differential Equations and introduces the concepts of feedback and its advantages to various control systems.** **TB: I.J.Nagarath and M.Gopal, " Control System Engineering," New Age International Publishers, Fifth Edition**			
1.	**Introduction**	**From: 18.11.2019** **To: 6.12.2019**	Lecture interspersed with discussions
2.	System Control System		
3.	Open Loop Control System		
4.	Closed loop Control System		
5,6.	Different Examples		
7.	**Mathematical models of Physical Systems**		
8,9,10.	Transfer functions		
11,12.	Differential equations of physical systems		
13to18.	Block diagram Algebra		
19.	Signal flow graphs with illustrative examples		
20.	**Effects of Feedback**		
21.	Feedback Characteristics and its advantages		
	Linearizing effect of feedback		
UNIT-II CONTROLLER COMPONENTS & TIME RESPONSE ANALYSIS **CO2: Obtaining Transfer Function of a servo motor and the performance metrics to design the control system in time-domain.** **TB:I.J.Nagarath and M.Gopal, " Control System Engineering," New Age International Publishers, Fifth Edition**			
	Controller Components		
22.	DC Servomotor (Armature Controlled and Field Controlled) with necessary derivation for transfer function	**From: 9.12.2019** **To: 21.12.2019**	Lecture interspersed with discussions
23.	AC Servomotor and its transfer function		
24.	AC Tachometer		
	Potentiometer		
25.	Synchros		
	AC Position Control Systems		
26.	**Time Response Analysis**		
27.	Standard test Signals		
28 to 31.	Time response of first and second order systems		

TENTATIVE PLAN: R1622042

Course Title: CONTROL SYSTEMS (R1622042)		
Section : B	Date : 18.11.2020	Page No : 02 of 03
Revision No : 00	Prepared By : A.V.P.Sarvari	Approved By : HOD

Tools : Black board, PPTs

No. of Periods	TOPIC	Date	Mode of Delivery
32.	steady state errors and error constants	From: 9.12.2019 To: 21.12.2019	Lecture interspersed with discussions
33.	Effect of adding a zero to a system		
34.	Design specifications of second order systems		
35.	Performance indices		
UNIT-III CONCEPTS OF STABILITY & ROOT LOCUS TECHNIQUE **CO3: Obtaining the location of roots of linear differential equations having real coefficients and commenting on stability. Locating roots in S-Domain and finding critical value of open-loop gain K for stability of system.** **TB:I.J.Nagarath and M.Gopal, " Control System Engineering," New Age International Publishers, Fifth Edition**			
	Concepts of Stability and Algebraic Criteria		Lecture interspersed with discussions
36.	The concept of Stability	From: 23.12.2019 To: 10.1.2020	
37.	Necessary Conditions for Stability		
38.	**Routh-Hurwitz Srability Criterion**		
39.	Relative stability analysis		
40.	The Root Locus Technique Introduction		
41.	The Root Locus concepts		
42.	Construction of Root Loci		
43.	**Tutorial**		
UNIT-IV FREQUENCY RESPONSE ANALYSIS **CO4: Analyzing the stability of the system in frequency domain and obtaining frequency domain specifications.** **TB:I.J.Nagarath and M.Gopal, " Control System Engineering," New Age International Publishers, Fifth Edition**			
44.	**Frequency response analysis**	From: 24.1.2020 To: 15.2.2020	Lecture interspersed with discussions
45.	Introduction		
46.	Correlation between time and frequency response		
47 to 51.	Polar Plots		
52to57.	Bode Plots		
58to67.	Nyquist Stability Criterion		
68,69.	**Tutorial**		

TENTATIVE PLAN: R1622042

Course Title: CONTROL SYSTEMS (R1622042)		
Section : B	Date : 18.11.2020	Page No : 03 of 03
Revision No : 00	Prepared By : A.V.P.Sarvari	Approved By : HOD

Tools : Black board, PPTs

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-V INTRODUCTION TO DESIGN **CO5: Compensating system performance using Lag, Lead and Lag-lead controllers and Analyzing the effect of proportionality controllers.** **TB:I.J.Nagarath and M.Gopal, " Control System Engineering," New Age International Publishers, Fifth Edition**			
70.	**Introduction to Design**	**From: 17.2.2020** **To: 7.3.2020**	Lecture interspersed with discussions
71.	The design problem		
72.	Preliminary consideration of classical design		
73to76.	Realization of basic Compensators		
77.	Cascade compensation in time domain and frequency domain		
78.	Tuning of PID Controllers		
79.	**Tutorial**		
UNIT-VI STATE VARIABLE ANALYSIS AND DESIGN **CO6:Representing a control system using state equations.** **TB:I.J.Nagarath and M.Gopal, " Control System Engineering," New Age International Publishers, Fifth Edition**			
	State Variable Analysis and Design		Lecture interspersed with discussions
80.	Introduction	**From: 9.3.2020** **To: 23.3.2020**	
81.	Concepts of State		
	State Variables and State models		
82.	State models for linear continuous-time systems		
83.	State variables and linear discrete-time systems		
84,85,86.	Solution of state equations and Concepts of Controllability and Observability		
87.	**Tutorial**		

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TENTATIVE LESSON PLAN: R1622043
EM WAVES AND TRANSMISSION LINES

Course Title: EM WAVES AND TRANSMISSION LINES		
Section : Sec I	Date : 18/11/19	Page No : 01 of 03
Revision No : 00	Prepared By : P.Koteswara Rao	Approved By : HOD

Tools: Black board, PPTs

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I ELECTROSTATICS **CO1: An in depth analysis of electro static fields with help of Coulomb's Law &Gauss Law** **TB: " Elements of Electromagnetics", Matthew N.O. Sadiku, Oxford Univ. Press, 3rd ed., 2001**			
1	Review of Coordinate System	**From: 18.11.2019** **To: 6.12.2019**	Lecture interspersed with discussions
2	Coulomb's Law		
3	Electric Field Intensity, Electric Flux Density		
4	Gauss Law and Applications		
5	Electric Potential, Maxwell's Two Equations for ESF		
6	Energy Density, Illustrative Problems		
7	Convection and Conduction Currents		
8	Dielectric Constant, Continuity Equation, Relaxation Time		
	Poisson's and Laplace's Equations		
9	Capacitance: Parallel Plate, Coaxial		
10	Illustrative Problems		
	Illustrative Problems		
UNIT-II MAGNETOSTATICS **CO2: An in depth analysis of electro static fields with help of Biot-Savart's Law and Ampere's Circuital Law** **TB: " Elements of Electromagnetics", Matthew N.O. Sadiku, Oxford Univ. Press, 3rd ed., 2001.**			
11	Biot-Savart Law, Ampere's Circuital Law and Applications		
12	Magnetic Flux Density, Maxwell Equations for MSF		
13	Magnetic Scalar and Vector Potentials		
14	Forces due to Magnetic Fields		
15	Ampere's Force Law, Inductances, Magnetic Energy		

	Illustrative Problems		
16	**Maxwell's Equations (Time Varying Fields)**	**From: 9.12.2019 To: 21.12.2019**	Lecture interspersed with discussions
17	Faraday's Law and Transformer emf		
18	Inconsistency of Ampere's Law		
	Displacement Current Density		
19	Maxwell's Equations in Different Final Forms		
	Conditions at Boundary Surface: Dielectric-Dielectric Interfaces		
20	Dielectric-Conductor Interfaces		
21	Illustrative Problems		
	Illustrative Problems		

UNIT-III EM WAVE CHARACTERISTICS-I

CO3: Interpret the effects of lossy and low loss dielectrics and conductors upon the propagation of electromagnetic waves, and predict this process in specific applications

TB: " Elements of Electromagnetics", Matthew N.O. Sadiku, Oxford Univ. Press, 3rd ed., 2001.

22	Wave Equations for Conducting and Dielectric Media	**From: 23.12.2019 To: 10.1.2020**	Lecture interspersed with discussions
23	Uniform Plane Waves – Definition, All Relations Between E & H, Sinusoidal Variations		
24	Wave Propagation in Lossy and Lossless Dielectrics		
25	Wave Propagation in free space		
	Wave Propagation in good conductors		
26	Skin depth		
27	Polarization & Types		
28	Illustrative Problems		
	Illustrative Problems		

UNIT-IV EM WAVE CHARACTERISTICS-II

CO4: Able to demonstrate the reflection and refraction of waves at boundaries

TB: "Elements of Electromagnetics", Matthew N.O. Sadiku, Oxford Univ. Press, 3rd ed., 2001.

29	Reflection and Refraction of Plane Waves	**From: 24.1.2020 To: 15.2.2020**	Lecture
30	Normal and Oblique Incidences for both Perfect Conductor and Perfect Dielectrics		
31	Brewster Angle, Critical Angle, Total Internal Reflection		
32	Surface Impedance		
33	Poynting Vector , Poynting Theorem		

34	Power Loss in a Plane Conductor		interspersed with discussions
35	Illustrative Problems		
UNIT-V TRANSMISSION LINES-I **CO5: Demonstrate and compute various parameters for transmission lines using either a smith chart or classical theory** **TB: " Elements of Electromagnetics", Matthew N.O. Sadiku, Oxford Univ. Press, 3rd ed., 2001.**			
36	Types, Parameters	**From: 17.2.2020** **To: 7.3.2020**	Lecture interspersed with discussions
37	T & π equivalent circuits		
38	Transmission Line Equations		
	Primary & Secondary Constants		
39	Expression for Characteristic Impedance		
	Propagation Constant		
40	Phase & group Velocities		
41	Infinite Line Concepts		
42	Lossless lines/Low Loss		
43	Distortion – Condition for Distortion less lines and Minimum Attenuation		
44	Loading - Types of Loading		
	Illustrative Problems		
UNIT-VI TRANSMISSION LINES-II **CO6: Design matching networks for loaded transmission lines** **TB: " Elements of Electromagnetics", Matthew N.O. Sadiku, Oxford Univ. Press, 3rd ed., 2001.**			
45	Input Impedance Relations, SC and OC Lines	**From: 9.3.2020** **To: 23.3.2020**	Lecture interspersed with discussions
46	Reflection Coefficient, VSWR		
47	Low loss radio frequency lines		
48	UHF Transmission lines		
49	UHF Lines as Circuit Elements; λ/4, λ /2, λ/8 Lines – Impedance Transformations		
50	Smith Chart – Construction		
51	Smith Chart – Construction		
52	Quarter wave transformer		
53	Single and Double Stub Matching		
54	Illustrative Problems		

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8 16/11/20
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TENTATIVE LESSON PLAN: R1622043
EM WAVES AND TRANSMISSION LINES

Course Title: EM WAVES AND TRANSMISSION LINES		
Section : Sec II	Date : 18/11/19	Page No : 01 of 03
Revision No : 00	Prepared By : P.Koteswara Rao	Approved By : HOD

Tools: Black board, PPTs

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I ELECTROSTATICS **CO1: An in depth analysis of electro static fields with help of Coulomb's Law &Gauss Law** **TB: " Elements of Electromagnetics", Matthew N.O. Sadiku, Oxford Univ. Press, 3rd ed., 2001**			
1	Review of Coordinate System	**From: 18.11.2019** **To: 6.12.2019**	Lecture interspersed with discussions
2	Coulomb's Law		
3	Electric Field Intensity, Electric Flux Density		
4	Gauss Law and Applications		
5	Electric Potential, Maxwell's Two Equations for ESF		
6	Energy Density, Illustrative Problems		
7	Convection and Conduction Currents		
8	Dielectric Constant, Continuity Equation, Relaxation Time		
	Poisson's and Laplace's Equations		
9	Capacitance: Parallel Plate, Coaxial		
10	Illustrative Problems		
	Illustrative Problems		
UNIT-II MAGNETOSTATICS **CO2: An in depth analysis of electro static fields with help of Biot-Savart's Law and Ampere's Circuital Law** **TB: " Elements of Electromagnetics", Matthew N.O. Sadiku, Oxford Univ. Press, 3rd ed., 2001.**			
11	Biot-Savart Law, Ampere's Circuital Law and Applications		
12	Magnetic Flux Density, Maxwell Equations for MSF		
13	Magnetic Scalar and Vector Potentials		
14	Forces due to Magnetic Fields		
15	Ampere's Force Law, Inductances, Magnetic Energy		

	Illustrative Problems		
16	**Maxwell's Equations (Time Varying Fields)**	**From: 9.12.2019** **To: 21.12.2019**	Lecture interspersed with discussions
17	Faraday's Law and Transformer emf		
18	Inconsistency of Ampere's Law		
	Displacement Current Density		
19	Maxwell's Equations in Different Final Forms		
	Conditions at Boundary Surface: Dielectric-Dielectric Interfaces		
20	Dielectric-Conductor Interfaces		
21	Illustrative Problems		
	Illustrative Problems		
UNIT-III EM WAVE CHARACTERISTICS-I **CO3: Interpret the effects of lossy and low loss dielectrics and conductors upon the propagation of electromagnetic waves, and predict this process in specific applications** **TB: " Elements of Electromagnetics", Matthew N.O. Sadiku, Oxford Univ. Press, 3rd ed., 2001.**			
22	Wave Equations for Conducting and Dielectric Media	**From: 23.12.2019** **To: 10.1.2020**	Lecture interspersed with discussions
23	Uniform Plane Waves – Definition, All Relations Between E & H, Sinusoidal Variations		
24	Wave Propagation in Lossy and Lossless Dielectrics		
25	Wave Propagation in free space		
	Wave Propagation in good conductors		
26	Skin depth		
27	Polarization & Types		
28	Illustrative Problems		
	Illustrative Problems		
UNIT-IV EM WAVE CHARACTERISTICS-II **CO4: Able to demonstrate the reflection and refraction of waves at boundaries** **TB: "Elements of Electromagnetics", Matthew N.O. Sadiku, Oxford Univ. Press, 3rd ed., 2001.**			
29	Reflection and Refraction of Plane Waves	**From: 24.1.2020** **To: 15.2.2020**	Lecture
30	Normal and Oblique Incidences for both Perfect Conductor and Perfect Dielectrics		
31	Brewster Angle, Critical Angle, Total Internal Reflection		
32	Surface Impedance		
33	Poynting Vector , Poynting Theorem		

34	Power Loss in a Plane Conductor		interspersed with discussions
35	Illustrative Problems		
UNIT-V TRANSMISSION LINES-I **CO5: Demonstrate and compute various parameters for transmission lines using either a smith chart or classical theory** **TB: " Elements of Electromagnetics", Matthew N.O. Sadiku, Oxford Univ. Press, 3rd ed., 2001.**			
36	Types, Parameters	**From: 17.2.2020** **To: 7.3.2020**	Lecture interspersed with discussions
37	T & π equivalent circuits		
38	Transmission Line Equations Primary & Secondary Constants		
39	Expression for Characteristic Impedance Propagation Constant		
40	Phase & group Velocities		
41	Infinite Line Concepts		
42	Lossless lines/Low Loss		
43	Distortion – Condition for Distortion less lines and Minimum Attenuation		
44	Loading - Types of Loading Illustrative Problems		
UNIT-VI TRANSMISSION LINES-II **CO6: Design matching networks for loaded transmission lines** **TB: "Elements of Electromagnetics", Matthew N.O. Sadiku, Oxford Univ. Press, 3rd ed., 2001.**			
45	Input Impedance Relations, SC and OC Lines	**From: 9.3.2020** **To: 23.3.2020**	Lecture interspersed with discussions
46	Reflection Coefficient, VSWR		
47	Low loss radio frequency lines		
48	UHF Transmission lines		
49	UHF Lines as Circuit Elements; λ/4, λ /2, λ/8 Lines – Impedance Transformations		
50	Smith Chart – Construction		
51	Smith Chart – Construction		
52	Quarter wave transformer		
53	Single and Double Stub Matching		
54	Illustrative Problems		

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8 16/11/20
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TENTATIVE LESSON PLAN: R1622044
ANALOG COMMUNICATIONS

Course Title: ANALOG COMMUNICATIONS		
Section : Sec I	Date : 18/11/19	Page No : 1 to 4
Revision No : 00	Prepared By : Dr. S Sri Gowri	Approved By : HOD

Tools: Black board, PPTs

S.NO.	TOPIC	Date	Mode of Delivery
UNIT-I AMPLITUDE MODULATION **CO1:** Able to learn the concept of Amplitude Modulation and Demodulation **TB1:** Principles of Communication Systems - Simon Haykin, John Wiley, 2nd Ed.,.			
1	Introduction to communication system	**From:** **18/11/19** **To** **06/12/19**	Lecture interspersed with discussions
2	Need for modulation		
3	Frequency Division Multiplexing		
4	Amplitude Modulation, Definition		
5	Time domain and frequency domain description		
6	Single tone modulation		
7	Power relations in AM waves,		
8	Generation of AM waves, Square law Modulator		
9	Switching modulator		
10	Detection of AM Waves, Square law detector		
11	Envelope detector		
12	Tutorial		
UNIT-II DSB & SSB MODULATION **CO2:** Able to learn the concept of Double Side Band Suppressed Carrier and Single Side Band Suppressed Carrier Modulation and Demodulation **TB1:** Principles of Communication Systems - Simon Haykin, John Wiley, 2nd Ed.,.			
13	**DSB & SSB MODULATION :** Double side band suppressed carrier modulators, time domain and frequency domain description	**From:** **09/12/19** **To** **3/12/19**	Lecture interspersed with discussions
14	Generation of DSBSC Waves Balanced Modulators		
15	Ring Modulator		
16	Coherent detection of DSB-SC Modulated waves COSTAS Loop		
17	Frequency domain description, Frequency discrimination method for generation of SSB		

18	Time domain description, Phase discrimination method for generating AM SSB Modulated waves		Lecture interspersed with discussions
19	Demodulation of SSB Waves		
20	Vestigial side band modulation: Frequency description,		
21	Generation of VSB Modulated wave, Time domain description		
22	Envelope detection of a VSB Wave pulse Carrier		
23	Comparison of AM Techniques, Applications of different AM Systems **&** Problems		
UNIT-III ANGLE MODULATION **CO3:** Able to learn the concept of Angle Modulation and Demodulation **TB1:** Principles of Communication Systems - Simon Haykin, John Wiley, 2nd Ed.,.			
24	**ANGLE MODULATION** : Basic concepts, Frequency Modulation	**From: 23/12/19 To 06/01/20**	Lecture interspersed with discussions
25	Single tone frequency modulation		
26	Spectrum Analysis of Sinusoidal FM Wave		
27	Narrow band FM .		
28	Wide band FM Constant Average Power		
29	Transmission bandwidth of FM Wave - Generation of FM Waves,		
30	Direct FM, Detection of FM Waves: Balanced Frequency discriminator,		
31	Zero crossing detector, Phase locked loop,		
32	Comparison of FM & AM		
33	Tutorial		
UNIT-IV TRANSMITTERS AND RECEIVERS **CO4:Gains Knowledge on different types of Transmitters and Receivers** **TB1:** Principles of Communication Systems - Simon Haykin, John Wiley, 2nd Ed.,.			
34	TRANSMITTERS & RECEIVERS: Radio Transmitter - Classification of Transmitter	**From: 09/01/20 To 18/02/20**	Lecture interspersed with discussions
35	AM Transmitter, Effect of feedback on performance of AM Transmitter		
36	FM Transmitter – Variable reactance type Phase modulated FM Transmitter		
37	Frequency stability in FM Transmitter		
38	Super heterodyne receiver		

39	RF section and Characteristics - Frequency changing and tracking Intermediate frequency		Lecture interspersed with discussions
40	AGC, FM Receiver		
41	Tutorial		
UNIT-V NOISE **CO5:** Gains Knowledge on effect of noise in Analog Communication System **TB1:** Principles of Communication Systems - Simon Haykin, John Wiley, 2nd Ed.,.			
42	NOISE : Review of noise and noise sources	**From: 27/02/20 To 18/03/20**	Lecture interspersed with discussions
43	Noise figure		
44	Noise in Analog communication Systems		
45	Noise in DSB& SSB System		
46	Noise in AM System		
47	Noise in Angle Modulation Systems		
48	Threshold effect in Angle Modulation System		
49	Pre-emphasis & de-emphasis		
50	Problems		
UNIT-VI PULSE MODULATION **CO6:** Acquires Knowledge on PAM, PWM and PPM Generation and Detection **TB1:** Principles of Communication Systems - Simon Haykin, John Wiley, 2nd Ed.,.			
51	PULSE MODULATION: Time Division multiplexing	**From: 19/02/20 To 26/02/20**	Lecture interspersed with discussions
52	Types of Pulse modulation		
53	PAM (Single polarity, double Polarity)		
54	PWM: Generation & demodulation of PWM,		
55	PPM, Generation and demodulation of PPM,		
56	TDM Vs FDM		
57	Problems		

TB1: Principles of Communication Systems - Simon Haykin, John Wiley, 2nd Ed.,.
TB2: Principles of Communication Systems – H Taub & D. Schilling, Gautam Sahe. TMH, 2007 3rd Edition.
TB3: Communication Systems – B.P. Lathi, BS Publication, 2006.

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TENTATIVE LESSON PLAN: R1622044
ANALOG COMMUNICATIONS

Course Title: ANALOG COMMUNICATIONS		
Section : Sec II	Date : 18/11/19	Page No : 1 to 4
Revision No : 00	Prepared By : G Surya Prakash	Approved By : HOD

Tools: Black board, PPTs

S.NO.	TOPIC	Date	Mode of Delivery
UNIT-I AMPLITUDE MODULATION **CO1:** Able to learn the concept of Amplitude Modulation and Demodulation **TB1:** Principles of Communication Systems - Simon Haykin, John Wiley, 2nd Ed.,.			
1	Introduction to communication system	**From:** **18/11/19** **To** **06/12/19**	Lecture interspersed with discussions
2	Need for modulation		
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5	Time domain and frequency domain description		
6	Single tone modulation		
7	Power relations in AM waves,		
8	Generation of AM waves, Square law Modulator		
9	Switching modulator		
10	Detection of AM Waves, Square law detector		
11	Envelope detector		
12	Tutorial		
UNIT-II DSB & SSB MODULATION **CO2:** Able to learn the concept of Double Side Band Suppressed Carrier and Single Side Band Suppressed Carrier Modulation and Demodulation **TB1:** Principles of Communication Systems - Simon Haykin, John Wiley, 2nd Ed.,.			
13	**DSB & SSB MODULATION :** Double side band suppressed carrier modulators, time domain and frequency domain description	**From:** **09/12/19** **To** **3/12/19**	Lecture interspersed with discussions
14	Generation of DSBSC Waves Balanced Modulators		
15	Ring Modulator		
16	Coherent detection of DSB-SC Modulated waves COSTAS Loop		
17	Frequency domain description, Frequency discrimination method for generation of SSB		

18	Time domain description, Phase discrimination method for generating AM SSB Modulated waves		Lecture interspersed with discussions
19	Demodulation of SSB Waves		
20	Vestigial side band modulation: Frequency description,		
21	Generation of VSB Modulated wave, Time domain description		
22	Envelope detection of a VSB Wave pulse Carrier		
23	Comparison of AM Techniques, Applications of different AM Systems & Problems		
UNIT-III ANGLE MODULATION **CO3:** Able to learn the concept of Angle Modulation and Demodulation **TB1:** Principles of Communication Systems - Simon Haykin, John Wiley, 2nd Ed.,.			
24	**ANGLE MODULATION** : Basic concepts, Frequency Modulation	**From: 23/12/19 To 06/01/20**	Lecture interspersed with discussions
25	Single tone frequency modulation		
26	Spectrum Analysis of Sinusoidal FM Wave		
27	Narrow band FM .		
28	Wide band FM Constant Average Power		
29	Transmission bandwidth of FM Wave - Generation of FM Waves,		
30	Direct FM, Detection of FM Waves: Balanced Frequency discriminator,		
31	Zero crossing detector, Phase locked loop,		
32	Comparison of FM & AM		
33	Tutorial		
UNIT-IV TRANSMITTERS AND RECEIVERS **CO4:Gains Knowledge on different types of Transmitters and Receivers** **TB1:** Principles of Communication Systems - Simon Haykin, John Wiley, 2nd Ed.,.			
34	TRANSMITTERS & RECEIVERS: Radio Transmitter - Classification of Transmitter	**From: 09/01/20 To 18/02/20**	Lecture interspersed with discussions
35	AM Transmitter, Effect of feedback on performance of AM Transmitter		
36	FM Transmitter – Variable reactance type Phase modulated FM Transmitter		
37	Frequency stability in FM Transmitter		
38	Super heterodyne receiver		

39	RF section and Characteristics - Frequency changing and tracking Intermediate frequency		Lecture interspersed with discussions
40	AGC, FM Receiver		
41	Tutorial		
UNIT-V NOISE **CO5:** Gains Knowledge on effect of noise in Analog Communication System **TB1:** Principles of Communication Systems - Simon Haykin, John Wiley, 2nd Ed.,.			
42	NOISE : Review of noise and noise sources	**From: 27/02/20 To 18/03/20**	Lecture interspersed with discussions
43	Noise figure		
44	Noise in Analog communication Systems		
45	Noise in DSB& SSB System		
46	Noise in AM System		
47	Noise in Angle Modulation Systems		
48	Threshold effect in Angle Modulation System		
49	Pre-emphasis & de-emphasis		
50	Problems		
UNIT-VI PULSE MODULATION **CO6:** Acquires Knowledge on PAM, PWM and PPM Generation and Detection **TB1:** Principles of Communication Systems - Simon Haykin, John Wiley, 2nd Ed.,.			
51	PULSE MODULATION: Time Division multiplexing	**From: 19/02/20 To 26/02/20**	Lecture interspersed with discussions
52	Types of Pulse modulation		
53	PAM (Single polarity, double Polarity)		
54	PWM: Generation & demodulation of PWM,		
55	PPM, Generation and demodulation of PPM,		
56	TDM Vs FDM		
57	Problems		

TB1: Principles of Communication Systems - Simon Haykin, John Wiley, 2nd Ed.,.
TB2: Principles of Communication Systems – H Taub & D. Schilling, Gautam Sahe. TMH, 2007 3rd Edition.
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TENTATIVE LESSON PLAN: R1622045
PULSE AND DIGITAL CIRCUITS

Course Title: PULSE & DIGITAL CIRCUITS		
Section : Sec I	Date : 18/11/19	Page No : 01 of 03
Revision No : 00	Prepared By : D.RAVI TEJ	Approved By : HOD

Tools: Black board, PPTs

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I LINEAR WAVW SHAPING **CO1: STUDY THE NATURE OF LINEAR CIRCUITS UNDER VARIOUS INPUTS** **T TB:" PULSE & DIGITAL CIRCUITS", A.ANAND KUMAR"**			
1	Introduction	18,19,20,21,23/11/19	Lecture interspersed with discussions
2	high pass rc circuit	25/11/19	
3	low pass rc circuit	25,26,27,28/11/19	
4	rseponse of hpf to sine, step,ramp	29/11/19,2/12/19	
5	response of hpf to pulse, square signals	3/12/19	
6	response of lpf to sine , step, ramp	6/12/19	
7	response pf lpf to pulse , square	7/12/19	
8	rc network as integratoe & differentiator	9/12/19	
9	rl & rlc circuit response to step		
10	ringing circuits	9/12/19	
11	ringing circuits	10/12/19	
UNIT-II NON LINEAR WAVW SHAPING **CO2: STUDY THE NATURE OF LINEAR CIRCUITS UNDER VARIOUS INPUTS** **TB:" PULSE & DIGITAL CIRCUITS", A.ANAND KUMAR"**			
12	diode & transistor clippers	12,13/12/19	Lecture interspersed with discussions
13	clipping at two levels , transfer charecteristics of clippers	12/12/19	
14	emitter clippers, comparators	16/12/19	
15	clamper with diode	19/12/19	
16	clamping theorem , effect of diode	17/12/19	
17	diode & transistor clippers	20/12/19	
18	clipping at two levels , transfer charecteristics of clippers	21/12/19	
19	emitter clippers, comparators		
20	clamper with diode	23/12/19	
21	clamping theorem , effect of diode		
22	transfer charecters of clampers	24/12/19	
23	Tutorial	26/12/19	
25	transfer charecters of clampers	26/12/19	

UNIT-III SWITCHING CHARECTERISTICS OF DEVICES **CO3: Design and study of Switching devices** **TB:" PULSE & DIGITAL CIRCUITS", A.ANAND KUMAR"**			
26	diode as switch	27/12/19	Lecture interspersed with discussions
27	linear charecteristics of diode	30/12/19	
28	transistor as switch	30/12/19	
29	break down voltage consideration	31/12/19	
30	saturation parameters	31/12/19	
31	variation of parameters with temperature	2/1/20	
32	transistor switching times	4/1/20	
33	comparision of logic families	6/1/20	
34	realization of logic gates with dtl, ttl, ecl and cmos logic	6/1/20	
35	diode as switch	6/1/20	
36	linear charecteristics of diode	7 /1/20	
37	transistor as switch	9/1/20	
38	break down voltage consideration	10/1/20	
39	saturation parameters	10/1/20	
UNIT-IV MULTIVIBRATORS **CO4: To Design and analyze Multivibrators** **TB:" PULSE & DIGITAL CIRCUITS", A.ANAND KUMAR"**			
40	analysis & design of fixed bias	29/2/20	Lecture interspersed with discussions
41	self bias bi-stable multivibrator	2/2/20	
42	collector catching circuits	3/2/20	
43	commutating caapacitors	12/2/20	
44	methods of triggering	13/3/20	
45	schmitt trigger	5/3/20	
46	collector coupled monostable multi vibrator	9/3/20	
47	voltage to time converter	9/3/20	
48	astable multivibrator	10/3/20	
49	voltage to frequency converter	16/3/20	
50	problems	17/3/20	
51	**tutorial**	17/3/20	
UNIT-V VOLTAGE TIME BASE GENERATOR **CO5: Design and analyze the voltage time base generators** **TB:" PULSE & DIGITAL CIRCUITS", A.ANAND KUMAR"**			
52	features of time base generator	27/1/20	Lecture interspersed with discussions
53	methods of generation	30/1/20	
54	miller & bootstrap circuits	31/1/20	
55	transistor bootstrap generator		
56	Tutorial	1,3/2/20	
57	problems		

58	miller & bootstrap circuits	3/2/20	
59	transistor bootstrap generator	4/2/20	
60	tutorial	6/2/20	
61	problems	7/2/20	
62	miller & bootstrap circuits	10/2/20	
63	transistor bootstrap generator	8/2/20	
UNIT-VI	**SYNCHRONIZATION OF FREQUENCY DIVISION SAMPLING**		
CO6: construct synchronization circuits & analyze.			
TB:" PULSE & DIGITAL CIRCUITS", A.ANAND KUMAR"			
64	principles of synchronization	10/2/20	Lecture interspersed with discussions
65	frequency division in sweep circuit	11/2/20	
66	relaxation circuits	13/2/20	
67	monostable relazation circuits	14/2/20	
68	synchronization -sweep circuits	15/2/20	
69	sampling gates	27/2/20	
70	uni-directional sampling gates	28/2/20	
71	bi-directional sampling gates	28/2/20	
72	pedestal in gate circuits	11/2/20	
73	tutorial	13/2/20	
74	problems	24/2/20	
75	principles of synchronization	17/2/20	
76	frequency division in sweep circuit	25/2/20	

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TENTATIVE LESSON PLAN: R1622045
PULSE AND DIGITAL CIRCUITS

Course Title: PULSE & DIGITAL CIRCUITS		
Section : Sec II	Date : 18/11/19	Page No : 01 of 03
Revision No : 00	Prepared By : D.RAVI TEJ	Approved By : HOD

Tools: Black board, PPTs

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I LINEAR WAVW SHAPING **CO1: STUDY THE NATURE OF LINEAR CIRCUITS UNDER VARIOUS INPUTS** **T TB:" PULSE & DIGITAL CIRCUITS", A.ANAND KUMAR"**			
1	Introduction	18/11/19	Lecture interspersed with discussions
2	high pass rc circuit	25/11/19	
3	low pass rc circuit	28/11/19	
4	rseponse of hpf to sine, step,ramp	29/11/19	
5	response of hpf to pulse, square signals	2/12/19	
6	response of lpf to sine , step, ramp	3/12/19	
7	response pf lpf to pulse , square	6/12/19	
8	rc network as integratoe & differentiator	7/12/19	
9	rl & rlc circuit response to step	9/12/19	
10	ringing circuits	9/12/19	
11	ringing circuits	10/12/19	
UNIT-II NON LINEAR WAVW SHAPING **CO2: STUDY THE NATURE OF LINEAR CIRCUITS UNDER VARIOUS INPUTS** **TB:" PULSE & DIGITAL CIRCUITS", A.ANAND KUMAR"**			
12	diode & transistor clippers	12/12/19	Lecture interspersed with discussions
13	clipping at two levels , transfer charecteristics of clippers	13/12/19	
14	emitter clippers, comparators	16/12/19	
15	clamper with diode	19/12/19	
16	clamping theorem , effect of diode	17/12/19	
17	diode & transistor clippers	20/12/19	
18	clipping at two levels , transfer charecteristics of clippers	21/12/19	
19	emitter clippers, comparators		
20	clamper with diode	23/12/19	
21	clamping theorem , effect of diode		
22	transfer charecters of clampers	24/12/19	
23	Tutorial	26/12/19	
25	transfer charecters of clampers	26/12/19	

UNIT-III SWITCHING CHARECTERISTICS OF DEVICES **CO3: Design and study of Switching devices** **TB:" PULSE & DIGITAL CIRCUITS", A.ANAND KUMAR"**			
26	diode as switch	27/12/19	Lecture interspersed with discussions
27	linear charecteristics of diode	30/12/19	
28	transistor as switch	30/12/19	
29	break down voltage consideration	31/12/19	
30	saturation parameters	31/12/19	
31	variation of parameters with temperature	2/1/20	
32	transistor switching times	4/1/20	
33	comparision of logic families	6/1/20	
34	realization of logic gates with dtl, ttl, ecl and cmos logic	6/1/20	
35	diode as switch	6/1/20	
36	linear charecteristics of diode	7 /1/20	
37	transistor as switch	9/1/20	
38	break down voltage consideration	10/1/20	
39	saturation parameters	10/1/20	
UNIT-IV MULTIVIBRATORS **CO4: To Design and analyze Multivibrators** **TB:" PULSE & DIGITAL CIRCUITS", A.ANAND KUMAR"**			
40	analysis & design of fixed bias	29/2/20	Lecture interspersed with discussions
41	self bias bi-stable multivibrator	2/2/20	
42	collector catching circuits	3/2/20	
43	commutating caapacitors	12/2/20	
44	methods of triggering	13/3/20	
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48	astable multivibrator	10/3/20	
49	voltage to frequency converter	16/3/20	
50	problems	17/3/20	
51	**tutorial**	17/3/20	
UNIT-V VOLTAGE TIME BASE GENERATOR **CO5: Design and analyze the voltage time base generators** **TB:" PULSE & DIGITAL CIRCUITS", A.ANAND KUMAR"**			
52	features of time base generator	27/1/20	Lecture interspersed with discussions
53	methods of generation	30/1/20	
54	miller & bootstrap circuits	31/1/20	
55	transistor bootstrap generator		
56	Tutorial	1,3/2/20	
57	problems		

58	miller & bootstrap circuits	3/2/20	
59	transistor bootstrap generator	4/2/20	
60	tutorial	6/2/20	
61	problems	7/2/20	
62	miller & bootstrap circuits	10/2/20	
63	transistor bootstrap generator	8/2/20	
UNIT-VI SYNCHRONIZATION OF FREQUENCY DIVISION SAMPLING **CO6: construct synchronization circuits & analyze.** **TB:" PULSE & DIGITAL CIRCUITS", A.ANAND KUMAR"**			
64	principles of synchronization	10/2/20	Lecture interspersed with discussions
65	frequency division in sweep circuit	11/2/20	
66	relaxation circuits	13/2/20	
67	monostable relazation circuits	14/2/20	
68	synchronization -sweep circuits	15/2/20	
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72	pedestal in gate circuits	11/2/20	
73	tutorial	13/2/20	
74	problems	24/2/20	
75	principles of synchronization	17/2/20	
76	frequency division in sweep circuit	25/2/20	

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ENIKEPADU, VIJAYAWADA-521 108

TENTATIVE LESSON PLAN: ECE

Course Title: MANAGEMENT SCIENCE(R1622026)		
Section :ECE –A	**Date :** 20-11-19	**Page No :** 01 of 02
Revision No : 00	**Prepared By** : B.NAVEEN	**Approved By : HOD**

Tools : Black board

No. of Periods (Planned)	TOPIC	Date (Planned)	Mode of Delivery
UNIT –I	**Introduction to Management**		
CO1:: Able to understand the concept and nature of management, evaluation of management theories, motivation and leadership styles			
TB :: Dr. A. R. Aryasri, Management Science' TMH 2011			
1	Introduction to management	20-11-19	Lecture interspersed with Discussions
2	Nature & importance of management	22-11-19	
3	Generic function of management	24-11-19	
4	Evaluation of management thoughts	26-11-19	
5	Motivation theories	27-11-19	
6	Decision making process	28-11-19	
7	Designing organization structure	29-11-19	
8	Principles & types of organization	30-11-19	
9	Organization typology	01-12-19	
10	Global leadership	03-12-19	
11	Principals and types of management	04-12-19	
UNIT –II	**: Operations Management**		
CO2:: Able to equip with concepts of operations, project management and inventory control			
TB :: Dr. A. R. Aryasri, Management Science' TMH 2011			
12	Work study	06-12-19	Lecture interspersed with discussions
13	Statistical quality control	06-12-19	
14	Control charts	13-12-19	
15	Problems On Control Charts	13-12-19	
16	Material Management	19-12-19	
17	Need For Inventory Control	20-12-19	
18	EOQ And ABC Analysis	20-12-19	
19	Problems On EOQ	22-12-19	
20	Other Methods Of EOQ	22-12-19	
UNIT-III: Functional management			
CO3:: Able to understand the different functional areas in an organization and their responsibilities- product life cycle and channels of distribution			
TB :: Dr. A. R. Aryasri, Management Science' TMH 2011			
21	Concept of HRM,HRD and PMIR	27-12-2019	Lecture interspersed with discussions
22	Functions of HRM	27-12-2019	
23	Wage payment plans	03-01-2020	
24	Job evolution Vs merit rating	03-01-2020	
25	Marketing management functions	20-01-2020	
26	Marketing strategies based on plc	20-01-2020	
27	Channels of distribution	21-01-2020	
28	Operational change management	24-01-2020	
29	Functions of marketing	24-01-2020	

UNIT-IVProject Management **CO4::** Able to equip with different techniques in project management, ie PERT and CPM and project crashing **TB ::** Dr. A. R. Aryasri, Management Science' TMH 2011			
30	Introduction to PERT and CPM	28-01-2020	Lecture interspersed with discussions
31	Development of network diagram	29-01-2020	
32	Difference between pert and CPM	07-02-2020	
33	Identifying critical part and probability	12-02-2020	
34	Project crashing simple problems	13-02-2020	
UNIT-V:Strategic Management **CO5::** Able to equip with the concept and practical issues relating to strategic management **TB ::** Dr. A. R. Aryasri, Management Science' TMH 2011			
35	Vision, mission, goals and strategy	15-02-2020	Lecture interspersed with discussions
36	Elements of corporate planning process	16-02-2020	
37	SWOT analysis	21-02-2020	
38	Steps in strategic formulation and implementation	21-02-2020	
39	Generic strategy and global strategy	23-02-2020	
40	Theories of MNCs	25-02-2020	
UNIT-VI:Contemporary Management Practices **CO6::** Able to equip with the contemporary management practices, **TB::** Dr. A. R. Aryasri, Management Science' TMH 2011			
41	Basic concepts of MIS	26-02-2020	Lecture interspersed with discussions
42	Total quality management	28-02-2020	
43	Just- In- Time, Six sigma	28-02-2020	
44	Supply chain management	02-03-2020	
45	Enterprise resource planning	05-03-2020	
46	Business process outsources	07-03-2020	
47	Business process re-engineering	11-03-2020	
48	Bench Marking	13-03-2020	
49	Balanced Score Card	13-03-2020	
50	Material Requirement Planning	14-03-2020	
51	Capability Maturity Model	14-03-2020	
52	Supply Chain Management	17-03-2020	
53	Manufacture Requirement Planning	19-03-2020	
54	Management information system	19-03-2020	
55	Six sigma	19-03-2020	

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TENTATIVE LESSON PLAN: R1622026
MANAGEMENT SCIENCE

Course Title: MANAGEMENT SCIENCE(R1622026)		
Section :ECE –B	**Date :** 20-11-19	**Page No :** 01 of 02
Revision No : 00	**Prepared By** : B.NAVEEN	**Approved By : HOD**

Tools : Black board

No. of Periods (Planned)	TOPIC	Date (Planned)	Mode of Delivery
UNIT –I **Introduction to Management** **CO1::** Able to understand the concept and nature of management, evaluation of management theories, motivation and leadership styles **TB ::** Dr. A. R. Aryasri, Management Science' TMH 2011			
1	Introduction to management	20-11-19	Lecture interspersed with Discussions
2	Nature & importance of management	23-11-19	
3	Generic function of management	24-11-19	
4	Evaluation of management thoughts	26-11-19	
5	Motivation theories	27-11-19	
6	Decision making process	27-11-19	
7	Designing organization structure	28-11-19	
8	Principles & types of organization	30-11-19	
9	Organization typology	01-12-19	
10	Global leadership	01-12-19	
11	Principals and types of management	03-12-19	
UNIT –II : Operations Management **CO2::** Able to equip with concepts of operations, project management and inventory control **TB ::** Dr. A. R. Aryasri, Management Science' TMH 2011			
12	Work study	06-12-19	Lecture interspersed with discussions
13	Statistical quality control	06-12-19	
14	Control charts	13-12-19	
15	Problems On Control Charts	13-12-19	
16	Material Management	19-12-19	
17	Need For Inventory Control	19-12-19	
18	EOQ And ABC Analysis	20-12-19	
19	Problems On EOQ	20-12-19	
20	Other Methods Of EOQ	22-12-19	
UNIT-III: Functional management **CO3::** Able to understand the different functional areas in an organization and their responsibilities- product life cycle and channels of distribution **TB ::** Dr. A. R. Aryasri, Management Science' TMH 2011			
21	Concept of HRM,HRD and PMIR	27-12-2019	Lecture interspersed with discussions
22	Functions of HRM	27-12-2019	
23	Wage payment plans	03-01-2020	
24	Job evolution Vs merit rating	03-01-2020	
25	Marketing management functions	19-01-2020	
26	Marketing strategies based on plc	19-01-2020	
27	Channels of distribution	20-01-2020	
28	Operational change management	23-01-2020	

29	Functions of marketing	24-01-2020	
UNIT-IVProject Management **CO4::** Able to equip with different techniques in project management, ie PERT and CPM and project crashing **TB ::** Dr. A. R. Aryasri, Management Science' TMH 2011			
30	Introduction to PERT and CPM	28-01-2020	Lecture interspersed with discussions
31	Development of network diagram	28-01-2020	
32	Difference between pert and CPM	07-02-2020	
33	Identifying critical part and probability	11-02-2020	
34	Project crashing simple problems	12-02-2020	
UNIT-V:Strategic Management **CO5::** Able to equip with the concept and practical issues relating to strategic management **TB ::** Dr. A. R. Aryasri, Management Science' TMH 2011			
35	Vision, mission, goals and strategy	15-02-2020	Lecture interspersed with discussions
36	Elements of corporate planning process	16-02-2020	
37	SWOT analysis	21-02-2020	
38	Steps in strategic formulation and implementation	21-02-2020	
39	Generic strategy and global strategy	23-02-2020	
40	Theories of MNCs	25-02-2020	
UNIT-VI:Contemporary Management Practices **CO6::** Able to equip with the contemporary management practices, **TB::** Dr. A. R. Aryasri, Management Science' TMH 2011			
41	Basic concepts of MIS	26-02-2020	Lecture interspersed with discussions
42	Total quality management	28-02-2020	
43	Just- In- Time, Six sigma	28-02-2020	
44	Supply chain management	02-03-2020	
45	Enterprise resource planning	04-03-2020	
46	Business process outsources	07-03-2020	
47	Business process re-engineering	11-03-2020	
48	Bench Marking	11-03-2020	
49	Balanced Score Card	13-03-2020	
50	Material Requirement Planning	14-03-2020	
51	Capability Maturity Model	14-03-2020	
52	Supply Chain Management	17-03-2020	
53	Manufacture Requirement Planning	17-03-2020	
54	Management information system	18-03-2020	
55	Six sigma	19-03-2020	

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TENTATIVE LESSON PLAN: R1632041

Course Title: MICROPROCESSORS AND MICROCONTROLLERS (R1632041)		
Section : A	Date : 18/11/19	Page No : 01 of 03
Revision No : 00	Prepared By : B.S.S.TEJESH	Approved By : HOD

Tools : Black board, PPTs, Moodle

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT –I	**8086/8088 MICROPROCESSORS**		
CO1: Student can understand the basics of 8086 microprocessors.			
TB : A.K.Ray, K.M.Bhurchandi,"Advanced Microprocessors and Peripherals", Tata McGraw Hill Publications, 2000.			
1.	Main features	19-24/11/19	Lecture interspersed with discussions
2.	pin diagram/description	26,26/11/19	
3.	8086 microprocessor family	27,28,29/11/19	
4.	8086 internalarchitecture	31/11/19	
5.	GPR REGISTERS	1/12/19	
6.	INDEX Registers,pointer registers	3,3/12/19	
7.	execution unit	4/12/19	
8.	interrupts and interrupt responses and flag registers	5/12/19	
9.	8086 system timing minimum mode	6/12/19	
10.	maximum mode configuration	7/12/19	
11.	Tutorial	8/12/19	
UNIT –II	**PROGRAMMING WITH 8086 MICROPROCESSOR**		
CO2: Able to develop programs for different addressing modes in machine and assembly languages.			
TB: A.K.Ray, K.M.Bhurchandi,"Advanced Microprocessors and Peripherals", Tata McGraw Hill Publications, 2000.			
12.	Program development steps	10/12/19	Lecture interspersed with discussions
13.	Instructions	11-18/12/19	
14.	addressing modes	18/12/19	
15.	Tutorial	19/12/19	
16.	assembler directives	20,20,21/12/19	
17.	writing simple programs with an assembler	22/12/19	
18.	assembly language program development tools	26,27/12/19	
19.	Tutorial	28/12/19	

TENTATIVE LESSON PLAN: R1632041

Course Title: MICROPROCESSORS AND MICROCONTROLLERS (R1632041)		
Section : A	Date : 18/11/19	Page No : 02 of 03
Revision No : 00	Prepared By : B.S.S.TEJESH	Approved By : HOD

Tools : Black board, PPTs

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT - III	**BASIC AND SPECIAL PURPOSE PROGRAMMABLE PERIPHERALS AND THEIR INTERFACING WITH 8086/88** **CO3: Able to interface 8086 with different peripherals and implement programs.** **TB : A.K.Ray, K.M.Bhurchandi,"Advanced Microprocessors and Peripherals", Tata McGraw Hill Publications, 2000.**		
20.	8254 software programmable timer/counter	29/12/19	Lecture interspersed with discussions
21.	Intel 8259 programmable interrupt controller	3/1/20	
22.	software and hardware interrupt applications	4/1/20	
23.	Intel8237a DMA controller	5/1/20	
24.	Tutorial	7/1/20	
25.	Intel 8255 programmable peripheral interface	8/1/20	
26.	keyboard interfacing	8,10,10/1/20	
27.	alphanumeric displays- LED		
28.	7-segment display		
29.	multiplexed 7-segment display, LCD		
30.	Intel 8279 programmable keyboard/display Controller	18,19,21,23/1/20	
31.	stepper motor,a/d,d/a	24,25,28/1/20	
UNIT –IV	**ADVANCED MICRO PROCESSORS** **CO4: Student can understand the advanced microprocessor 80386 and co processor 80387.** **TB: A.K.Ray, K.M.Bhurchandi,"Advanced Microprocessors and Peripherals", Tata McGraw Hill Publications, 2000.**		
32.	Introduction,	29/1/20	Lecture interspersed with discussions
33.	programming concepts	31,31/1/20	
34.	special purpose registers	1/2/20	
35.	Pins 80386	2/2/20	
36.	Tutorial		
37.	Moving to protected mode	4/2/20	
	Virtual mode	5,5/2/20	
38.	Memory paging mechanism	7-11/2/20	
39.	Architectural differences between 80386 and 80486 microprocessors	12,12/2/20	
40.	Tutorial	14,15/2/20	
UNIT –V	**8051 MICROCONTROLLER** **CO5: Ability to understand the microcontroller and able to write the programs on 8051.** **TB: Ajay V Deshmukh,"Microcontrollers", TATA McGraw Hill publications, 2012.**		
41.	Architecture	16-18/2/20	Lecture interspersed with discussions

TENTATIVE LESSON PLAN: R1632041

Course Title: MICROPROCESSORS AND MICROCONTROLLERS (R1632041)		
Section : A	Date : 18/11/19	Page No : 03 of 03
Revision No : 00	Prepared By : B.S.S.TEJESH	Approved By : HOD

Tools : Black board, PPTs

No. of Periods	TOPIC	Date	Mode of Delivery
42.	hardware concepts	19-22/2/20	Lecture interspersed with discussions
	input/output ports and circuits		
43.	External memory,	23/2/20	
44.	counters/timers	25,26,26/2/20	
45.	serial data input/output	28,28/2/20	
46.	interrupts.	1-5/3/20	
47.	Assembly language programming	7/3/20	
48.	Reg of 8051	8/3/20	
49.	Instructions	9/3/20	
50.	addressing modes	11/3/20	
51.	simple programs	12,12/3/20	
52.	Interfacing: keyboard	14/3/20	
53.	Interfacing displays (LED, 7-segment display unit)		
54.	A/D and D/A converters		
55.	Tutorial	15/3/20	

UNIT - VI PIC MICROCONTROLLERS AND ARM 32-BIT MICROCONTROLLER

CO6 : Student can understand PIC microcontroller and ARM processors.

TB : Ajay V Deshmukh,"Microcontrollers", TATA McGraw Hill publications, 2012.
Raj Kamal,"Microcontrollers", Pearson publications, 2009.

56.	Introduction	16/3/20	Lecture interspersed with discussions
57.	characteristics of PIC microcontroller	17/3/20	
58.	PIC microcontroller families	18/3/20	
59.	memory organization	19/3/20	
60.	parallel and serial input and output		
61.	Interrupts,	19/3/20	
62.	PIC 16F877 architecture	20,21/3/20	
63.	Instruction set of the PIC 16F877	22,23/3/20	

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TENTATIVE LESSON PLAN: R1632041

Course Title: MICROPROCESSORS AND MICROCONTROLLERS (R1632041)		
Section : B	Date : 18/11/19	Page No : 01 of 03
Revision No : 00	Prepared By : B.S.S.TEJESH	Approved By : HOD

Tools : Black board, PPTs, Moodle

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT –I	**8086/8088 MICROPROCESSORS**		
CO1: Student can understand the basics of 8086 microprocessors.			
TB : A.K.Ray, K.M.Bhurchandi,"Advanced Microprocessors and Peripherals", Tata McGraw Hill Publications, 2000.			
1.	Main features	19-24/11/19	Lecture interspersed with discussions
2.	pin diagram/description	26,26/11/19	
3.	8086 microprocessor family	27,28,29/11/19	
4.	8086 internalarchitecture	31/11/19	
5.	GPR REGISTERS	1/12/19	
6.	INDEX Registers,pointer registers	3,3/12/19	
7.	execution unit	4/12/19	
8.	interrupts and interrupt responses and flag registers	5/12/19	
9.	8086 system timing minimum mode	6/12/19	
10.	maximum mode configuration	7/12/19	
11.	Tutorial	8/12/19	
UNIT –II	**PROGRAMMING WITH 8086 MICROPROCESSOR**		
CO2: Able to develop programs for different addressing modes in machine and assembly languages.			
TB: A.K.Ray, K.M.Bhurchandi,"Advanced Microprocessors and Peripherals", Tata McGraw Hill Publications, 2000.			
12.	Program development steps	10,10/12/19	Lecture interspersed with discussions
13.	instructions	11-17/12/19	
14.	addressing modes	18/12/19	
15.	Tutorial	19/12/19	
16.	assembler directives	20,21/12/19	
17.	writing simple programs with an assembler	22/12/19	
18.	assembly language program development tools	26,27/12/19	
19.	Tutorial	28/12/19	

TENTATIVE LESSON PLAN: R1632041

Course Title: MICROPROCESSORS AND MICROCONTROLLERS (R1632041)		
Section : B	Date : 18/11/19	Page No : 02 of 03
Revision No : 00	Prepared By : B.S.S.TEJESH	Approved By : HOD

Tools : Black board, PPTs

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT - III	**BASIC AND SPECIAL PURPOSE PROGRAMMABLE PERIPHERALS AND THEIR INTERFACING WITH 8086/88**		
CO3: Able to interface 8086 with different peripherals and implement programs.			
TB : A.K.Ray, K.M.Bhurchandi,"Advanced Microprocessors and Peripherals", Tata McGraw Hill Publications, 2000.			
20.	8254 software programmable timer/counter	29/12/19	Lecture interspersed with discussions
21.	Intel 8259 programmable interrupt controller	2/1/20	
22.	software and hardware interrupt applications	3/1/20	
23.	Intel8237a DMA controller	4/1/20	
24.	Tutorial	5/1/20	
25.	Intel 8255 programmable peripheral interface	7/1/20	
26.	keyboard interfacing	8,9,10/1/20	
27.	alphanumeric displays- LED		
28.	7-segment display		
29.	multiplexed 7-segment display, LCD		
30.	Intel 8279 programmable keyboard/display controller	18,19,21,22/1/20	
31.	stepper motor,a/d,d/a	23,24/1/20	
UNIT –IV	**ADVANCED MICRO PROCESSORS**		
CO4: Student can understand the advanced microprocessor 80386 and co processor 80387.			
TB: A.K.Ray, K.M.Bhurchandi,"Advanced Microprocessors and Peripherals", Tata McGraw Hill Publications, 2000.			
32.	Introduction,	25/1/20	Lecture interspersed with discussions
33.	programming concepts	28/1/20	
34.	special purpose registers	29/1/20	
35.	Pins 80386	30/1/20	
36.	Tutorial		
37.	Moving to protected mode	31/1/20	
	Virtual mode	1/2/20	
38.	Memory paging mechanism	2-6/2/20	
39.	Architectural differences between 80386 and 80486 microprocessors	7,8/2/20	
40.	Tutorial	9,11/2/20	
UNIT –V	**8051 MICROCONTROLLER**		
CO5: Ability to understand the microcontroller and able to write the programs on 8051.			
TB: Ajay V Deshmukh,"Microcontrollers", TATA McGraw Hill publications, 2012.			
41.	Architecture	12-14/2/20	Lecture interspersed with discussions

TENTATIVE LESSON PLAN: R1632041

Course Title: MICROPROCESSORS AND MICROCONTROLLERS (R1632041)		
Section : B	Date : 18/11/19	Page No : 03 of 03
Revision No : 00	Prepared By : B.S.S.TEJESH	Approved By : HOD

Tools : Black board, PPTs

No. of Periods	TOPIC	Date	Mode of Delivery
42.	hardware concepts	15-20/2/20	Lecture interspersed with discussions
	input/output ports and circuits		
43.	External memory,	21/2/20	
44.	counters/timers	22,23/2/20	
45.	serial data input/output	25/2/20	
46.	interrupts.	26,27/2/20	
47.	Assembly language programming	28/2/20	
48.	Reg of 8051	1/3/20	
49.	Instructions	2/3/20	
50.	addressing modes	5/3/20	
51.	simple programs	6/3/20	
52.	Interfacing: keyboard	7/3/20	
53.	Interfacing displays (LED, 7-segment display unit)		
54.	A/D and D/A converters		
55.	Tutorial	8/3/20	
UNIT - VI PIC MICROCONTROLLERS AND ARM 32-BIT MICROCONTROLLER			
CO6 : Student can understand PIC microcontroller and ARM processors.			
TB : Ajay V Deshmukh,"Microcontrollers", TATA McGraw Hill publications, 2012.			
Raj Kamal,"Microcontrollers", Pearson publications, 2009.			
56.	Introduction	9/3/20	Lecture interspersed with discussions
57.	characteristics of PIC microcontroller	11/3/20	
58.	PIC microcontroller families	12/3/20	
59.	memory organization	13/3/20	
60.	parallel and serial input and output		
61.	Interrupts,	14/3/20	
62.	PIC 16F877 architecture	15-18/3/20	
63.	Instruction set of the PIC 16F877	19-23/3/20	

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TENTATIVE LESSON PLAN
MICROWAVE ENGINEERING (R1632042)

Course Title: MICROWAVE ENGINEERING (R1632042)		
Section : Sec I	Date : 18/11/2019	Page No : 01 of 03
Revision No : 00	Prepared By : N.V.K Maha Lakshmi	Approved By : HOD

Tools: Black board, PPTs

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I MICROWAVE TRANSMISSION LINES **CO1: Study about the microwave frequencies and waveguides that are used to carry them, various parameters and characteristics of the rectangular waveguides.** **TB: "Microwave Devices and Circuits", Samuel Y. Liao, 3rd edition, Pearson Education**			
1	Microwave transmission lines: introduction	18/11/2019	Lecture interspersed with discussions
2	Microwave Spectrum and Bands, Applications of Microwaves	18/11/2019 19/11/2019	
3	Rectangular Waveguides	19/11/2019	
4	TE mode analysis	22/11/2019	
5	TM mode analysis	23/11/2019	
6	Expressions for Fields	25/11/2019	
7	Characteristic Equation	25/11/2019	
8	Cut-off Frequencies, Filter Characteristics	26/11/2019	
9	Dominant and Degenerate Modes	26/11/2019	
10	Sketches of TE and TM mode fields	29/11/2019	
11	Phase and Group Velocities, Wavelengths	30/11/2019	
12	Impedance Relations	5/12/2019	
13	Power Transmission and Power Losses	6/12/2019	
14	Impossibility of TEM mode	10/12/2019	
15	Related Problems	11/12/2019	
UNIT-II CIRCULAR WAVEGUIDES **CO2: Study the various parameters and characteristics of the circular waveguides, microstrip lines and cavity resonators.** **TB: "Microwave Devices and Circuits", Samuel Y. Liao, 3rd edition, Pearson Education**			
16	Nature of Fields	12/12/2019	Lecture interspersed with discussions
17	Characteristic Equation	13/12/2019	
18	Dominant and Degenerate Modes	19/12/2019	
19	Micro strip Lines– Introduction	19/12/2019	
20	Z_o Relations, Effective Dielectric Constant	20/12/2019	
21	Losses, Q factor	24/12/2019	
22	Cavity Resonators	31/12/2019	
23	Dominant Modes and Resonant Frequencies	31/12/2019	
24	Q factor and Coupling Coefficients	3/1/2020	

No. of Periods	TOPIC	Date	Mode of Delivery
25	Excitation techniques	4/1/2020	
26	Related Problems	4/1/2020	
UNIT-III MICROWAVE TUBES **CO3: Analyze mathematically the operation of the various tubes or sources used for the transmission of microwave frequencies.** **TB: "Microwave Devices and Circuits", Samuel Y. Liao, 3rd edition, Pearson Education**			
27	Limitations and Losses of conventional tubes	6/1/2020	Lecture interspersed with discussions
28	Microwave tubes – O type and M type classifications	6/1/2020	
29	O-type tubes : 2 Cavity Klystrons	7/1/2020	
30	Structure, Reentrant Cavities	9/1/2020	
31	Velocity Modulation Process	10/1/2020	
32	Applegate Diagram, Bunching Process	10/1/2020	
33	Expressions for o/p Power and Efficiency	27/1/2020	
34	Reflex Klystrons – Structure,	27/1/2020	
35	Applegate Diagram and Principle of working	28/1/2020	
36	Mathematical Theory of Bunching	28/1/2020	
37	Power Output, Efficiency	31/1/2020	
38	Electronic Admittance, Oscillating Modes	3/2/2020	
39	Electronic and Mechanical Tuning	7/2/2020	
40	Related Problems	8/2/2020	
UNIT-IV HELIX TWTS **CO5: Study the significance, types and characteristics of slow wave structures and cross field tubes for the transmission of the microwave frequencies.** **TB: "Microwave Devices and Circuits", Samuel Y. Liao, 3rd edition, Pearson Education**			
41	Significance, Types	16/3/2020	Lecture interspersed with discussions
42	Characteristics of Slow Wave Structures	16/3/2020	
43	Structure of TWT	16/3/2020	
44	Suppression of Oscillations	17/3/2020	
45	Nature of the four Propagation Constants	17/3/2020	
46	M-type Tubes Introduction, Cross-field effects	17/3/2020	
47	Magnetrons – Different Types	18/3/2020	
48	8-Cavity Cylindrical Travelling Wave	18/3/2020	
49	Magnetron – Hull Cut-off and Hartree Conditions	19/3/2020	
50	Modes of Resonance , PI-Mode Operation	19/3/2020	
51	Separation of PI-Mode, o/p characteristics	19/3/2020	
52	Related Problems	19/3/2020	
UNIT-V WAVEGUIDE COMPONENTS AND APPLICATIONS **CO5: Implement waveguide components and devices for various applications.** **TB: "Microwave and Radar Engineering", G Sasi Bhushana Rao, Pearson Education**			
53	Coupling Mechanisms: Probe, Loop	10/2/2020	
54	Waveguide Discontinuities: Waveguide irises,	11/2/2020	

No. of Periods	TOPIC	Date	Mode of Delivery
55	Waveguide Attenuators: Resistive Card type	14/2/2020	Lecture interspersed with discussions
56	Waveguide Phase Shifters	14/2/2020	
57	S-Matrix– Significance, Formulation & Properties	18/2/2020	
58	S-Matrix Calculations for H-plane Tee	24/2/2020	
59	S-Matrix Calculations for E-plane Tee	24/2/2020	
60	Magic Tee, Hybrid Ring	25/2/2020	
61	Directional Couplers – 2Hole, Bethe Hole	28/2/2020	
62	Ferrite Components– Faraday Rotation	28/2/2020	
63	S-Matrix Calculations for Gyrator, Isolator, Circulator	29/2/2020	
64	Related Problems	2/3/2020	
UNIT-VI MICROWAVE SOLID STATE DEVICES **CO6: Analyze the significance, types and characteristics of microwave solid state devices and acquire knowledge in various microwave measurements.** **TB1: "Microwave Devices and Circuits", Samuel Y. Liao, 3rd edition, Pearson Education** **TB2: "Microwave and Radar Engineering", G Sasi Bhushana Rao, Pearson Education**			
65	Introduction, Classification, Applications	2/3/2020	Lecture interspersed with discussions
66	TEDs -Gunn Diode – Principle	3/3/2020	
67	RWH Theory, Characteristics	3/3/2020	
68	Basic Modes of Operation, Oscillation Modes	7/3/2020	
69	Avalanche Transit Time Devices	9/3/2020	
70	IMPATT Diodes - Principle of Operation and Characteristics	10/3/2020	
71	TRAPATT Diodes- Principle of Operation and Characteristics	10/3/2020	
72	Related Problems	9/3/2020	
73	Description of Microwave Bench	13/3/2020	
74	Different Blocks and their Features	13/3/2020	
75	Microwave Power Measurement – Bolometer	16/3/2020	
76	Measurement of Attenuation, Frequency, VSWR	16/3/2020	
77	Cavity Q, Impedance Measurements	16/3/2020	

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TENTATIVE LESSON PLAN
MICROWAVE ENGINEERING (R1632042)

Course Title: MICROWAVE ENGINEERING (R1632042)		
Section : Sec II	Date : 18/11/2019	Page No : 01 of 03
Revision No : 00	Prepared By : N.V.K Maha Lakshmi	Approved By : HOD

Tools: Black board, PPTs

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I MICROWAVE TRANSMISSION LINES **CO1: Study about the microwave frequencies and waveguides that are used to carry them, various parameters and characteristics of the rectangular waveguides.** **TB: "Microwave Devices and Circuits", Samuel Y. Liao, 3rd edition, Pearson Education**			
1	Microwave transmission lines: introduction	18/11/2019	Lecture interspersed with discussions
2	Microwave Spectrum and Bands, Applications of Microwaves	20/11/2019 21/11/2019	
3	Rectangular Waveguides	21/11/2019	
4	TE mode analysis	23/11/2019	
5	TM mode analysis	23/11/2019	
6	Expressions for Fields	25/11/2019	
7	Characteristic Equation	27/11/2019	
8	Cut-off Frequencies, Filter Characteristics	28/11/2019	
9	Dominant and Degenerate Modes	28/11/2019	
10	Sketches of TE and TM mode fields	30/11/2019	
11	Phase and Group Velocities, Wavelengths	30/11/2019	
12	Impedance Relations	2/12/2019	
13	Power Transmission and Power Losses	4/12/2019	
14	Impossibility of TEM mode	5/12/2019	
15	Related Problems	5/12/2019	
UNIT-II CIRCULAR WAVEGUIDES **CO2: Study the various parameters and characteristics of the circular waveguides, microstrip lines and cavity resonators.** **TB: "Microwave Devices and Circuits", Samuel Y. Liao, 3rd edition, Pearson Education**			
16	Nature of Fields	7/12/2019	Lecture interspersed with discussions
17	Characteristic Equation	7/12/2019	
18	Dominant and Degenerate Modes	9/12/2019	
19	Micro strip Lines– Introduction	11/12/2019	
20	Z_o Relations, Effective Dielectric Constant	12/12/2019	
21	Losses, Q factor	12/12/2019	
22	Cavity Resonators	16/12/2019	
23	Dominant Modes and Resonant Frequencies	18/12/2019	
24	Q factor and Coupling Coefficients	19/12/2019	

No. of Periods	TOPIC	Date	Mode of Delivery
25	Excitation techniques	19/12/2019	
26	Related Problems	21/12/2019	
UNIT-III MICROWAVE TUBES **CO3: Analyze mathematically the operation of the various tubes or sources used for the transmission of microwave frequencies.** **TB: "Microwave Devices and Circuits", Samuel Y. Liao, 3rd edition, Pearson Education**			
27	Limitations and Losses of conventional tubes	21/12/2019	Lecture interspersed with discussions
28	Microwave tubes – O type and M type classifications	23/12/2019	
29	O-type tubes : 2 Cavity Klystrons	26/12/2019	
30	Structure, Reentrant Cavities	28/12/2019	
31	Velocity Modulation Process	28/12/2019	
32	Applegate Diagram, Bunching Process	30/12/2019	
33	Expressions for o/p Power and Efficiency	2/1/2020	
34	Reflex Klystrons – Structure,	2/1/2020	
35	Applegate Diagram and Principle of working	4/1/2020	
36	Mathematical Theory of Bunching	4/1/2020	
37	Power Output, Efficiency	6/1/2020	
38	Electronic Admittance, Oscillating Modes	8/1/2020	
39	Electronic and Mechanical Tuning	9/1/2020	
40	Related Problems	9/1/2020	
UNIT-IV HELIX TWTS **CO4: Study the significance, types and characteristics of slow wave structures and cross field tubes for the transmission of the microwave frequencies.** **TB: "Microwave and Radar Engineering", G Sasi Bhushana Rao, Pearson Education**			
41	Significance, Types	4/3/2020	Lecture interspersed with discussions
42	Characteristics of Slow Wave Structures	5/3/2020	
43	Structure of TWT	7/3/2020	
44	Suppression of Oscillations	9/3/2020	
45	Nature of the four Propagation Constants	11/3/2020	
46	M-type Tubes Introduction, Cross-field effects	12/3/2020	
47	Magnetrons – Different Types	12/3/2020	
48	8-Cavity Cylindrical Travelling Wave	16/3/2020	
49	Magnetron – Hull Cut-off and Hartree Conditions	18/3/2020	
50	Modes of Resonance , PI-Mode Operation	19/3/2020	
51	Separation of PI-Mode, o/p characteristics	19/3/2020	
52	Related Problems	21/3/2020	
UNIT-V WAVEGUIDE COMPONENTS AND APPLICATIONS **CO5: Implement waveguide components and devices for various applications.** **TB: "Microwave and Radar Engineering", G Sasi Bhushana Rao, Pearson Education**			
53	Coupling Mechanisms: Probe, Loop	27/1/2020	
54	Waveguide Discontinuities: Waveguide irises,	29/1/2020	

No. of Periods	TOPIC	Date	Mode of Delivery
55	Waveguide Attenuators: Resistive Card type	30/1/2020	Lecture interspersed with discussions
56	Waveguide Phase Shifters	30/1/2020	
57	S-Matrix– Significance, Formulation & Properties	1/2/2020	
58	S-Matrix Calculations for H-plane Tee	1/2/2020	
59	S-Matrix Calculations for E-plane Tee	3/2/2020	
60	Magic Tee, Hybrid Ring	5/2/2020	
61	Directional Couplers – 2Hole, Bethe Hole	6/2/2020	
62	Ferrite Components– Faraday Rotation	6/2/2020	
63	S-Matrix Calculations for Gyrator, Isolator, Circulator	10/2/2020	
64	Related Problems	12/2/2020	
UNIT-VI MICROWAVE SOLID STATE DEVICES **CO6: Analyze the significance, types and characteristics of microwave solid state devices and acquire knowledge in various microwave measurements.** **TB1: "Microwave Devices and Circuits", Samuel Y. Liao, 3rd edition, Pearson Education** **TB2: "Microwave and Radar Engineering", G Sasi Bhushana Rao, Pearson Education**			
65	Introduction, Classification, Applications	13/2/2020	Lecture interspersed with discussions
66	TEDs -Gunn Diode – Principle	13/2/2020	
67	RWH Theory, Characteristics	15/2/2020	
68	Basic Modes of Operation, Oscillation Modes	17/2/2020	
69	Avalanche Transit Time Devices	19/2/2020	
70	IMPATT Diodes - Principle of Operation and Characteristics	20/2/2020	
71	TRAPATT Diodes- Principle of Operation and Characteristics	22/2/2020	
72	Related Problems	24/2/2020	
73	Description of Microwave Bench	26/2/2020	
74	Different Blocks and their Features	27/2/2020	
75	Microwave Power Measurement – Bolometer	27/2/2020	
76	Measurement of Attenuation, Frequency, VSWR	29/2/2020	
77	Cavity Q, Impedance Measurements	2/3/2020	

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TENTATIVE LESSON PLAN: R1632043

Course Title: VLSI DESIGN (R1632043)		
Section : A	Date : 18-11-2019	Page No : 01 of 03
Revision No : 00	Prepared By : K.VENKATESWARA RAO	Approved By : HOD

Tools: Black board, PPTs, Moodle

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT –I	**Introduction, Electrical properties**		
CO1: Student can understand the basic electrical properties			
TB : Kamran Eshraghian, Douglas and A. Pucknell and Sholeh Eshraghian, Prentice-Hall of India Private Limited, 2005 Edition" ESSENTIALS OF VLSI CIRCUITS AND SYSTEMS"			
1.	Introduction to IC technology, MOS related VLSI Technology, Basic MOS transistors	**From 18-11-19 to 05-12-19**	Lecture interspersed with discussions
2.	Enhancement and Depletion modes , IC production process		
3.	MOS and CMOS fabrication process		
4.	Bi-CMOS technology, comparison of CMOS & Bipolar		
5.	Ids versus Vds relationships		
6.	Aspects of MOS Vt , Trans & Output conductance		
7.	Pass transistor, NMOS inverter		
8.	Pull-Up to Pull-down ratio for NMOS inverter		
9.	driven by another NMOS inverter		
	Alternative forms of Pull-Ups		
10.	CMOS inverter , Circuit model,Bi-CMOS inverter		
11.	Latch up in CMOS , latch up susceptibility		
UNIT –II	**MOS & Bi-CMOS design Process**		
CO2: Able to develop designing methodologies of MOS devices			
TB: Kamran Eshraghian, Douglas and A. Pucknell and Sholeh Eshraghian, Prentice-Hall of India Private Limited, 2005 Edition" ESSENTIALS OF VLSI CIRCUITS AND SYSTEMS"			
12.	MOS layers	**From 05-12-19 to 20-12-19**	Lecture interspersed with discussions
13.	Stick diagrams		
14.	Design rules and layouts		
15.	General observations on design rules		
16.	2μm double metal double poly		
17.	CMOS/BiCMOS rules		
18.	1.2μm double metal double poly CMOS rules		
19.	Layout diagrams of NAND and NOR gates and CMOS inverters		
20	Symbolic diagrams-translation to mask forms		

TENTATIVE LESSON PLAN: R1632043

Course Title: VLSI DESIGN (R1632043)		
Section : A	Date : 18-11-2019	Page No : 02 of 03
Revision No : 00	Prepared By : : K.VENKATESWARA RAO	Approved By : HOD

Tools: Black board, PPTs

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT - III	**Basic circuit concepts**		
CO3: Able to interface the design methodologies with fabrication procedures.			
TB : Kamran Eshraghian, Douglas and A. Pucknell and Sholeh Eshraghian, Prentice-Hall of India Private Limited, 2005 Edition" ESSENTIALS OF VLSI CIRCUITS AND SYSTEMS"			
21.	Sheet resistance & application to MOS transistors and inverters	**from 23-12-19 to 10-01-20**	Lecture interspersed with discussions
22.	Area capacitance of layers		
23.	Standard unit of capacitance		
24.	Delay unit, Inverter delays		
25.	Propagation delays, wiring capacitances		
26.	Fan-in & Fan-Out characteristics , choice of layers		
27.	Transistor switches		
28.	Realization of gates using NMOS , PMOS and CMOS technologies		
29.	Sheet resistance & application to MOS transistors and inverters		
30.	Gate Logic ,Transmission gate		
31.	Limits due to sub-threshold currents		
32.	Current density limits on logic levels and supply voltages		
UNIT –IV	**Design for Testability Chip Input and Output circuits**		
CO4: Student can understand the advanced design procedures with partitioning.			
TB: T2: CMOS Digital Integrated Circuits Analysis and Design- Sung-Mo Kang, Yusuf Leblebici, Tata McGraw- Hill Education, 2003.			
33.	Fault types and Models	**from 28-01-20 to 07-02-20**	Lecture interspersed with discussions
34.	Controllability and Observability		
35. 36.	Ad Hoc Testable Design Techniques		
37.	Built-In Self Test techniques		
38.	Scan Based Techniques		
39.	ESD Protection, Input Circuits		
40.	Output Circuits and L(di/dt) Noise		
41.	On-Chip clock Generation and Distribution.		
UNIT –V	**FPGA Design**		
CO5: Ability to understand the constrains in the front end design of the circuits.			
TB: T2: CMOS Digital Integrated Circuits Analysis and Design- Sung-Mo Kang, Yusuf Leblebici, Tata McGraw- Hill Education, 2003..			
42.	Basic FPGA architecture, FPGA configuration		Lecture interspersed with discussions

TENTATIVE LESSON PLAN: R1632043

Course Title: VLSI DESIGN (R1632043)		
Section : A	Date : 18-11-2019	Page No : 03 of 03
Revision No : 00	Prepared By : : K.VENKATESWARA RAO	Approved By : HOD

Tools : Black board, PPTs

No. of Periods	TOPIC	Date	Mode of Delivery
43.	FPGA design flow	from 08-02-20 to 26-02-20	Lecture interspersed with discussions
44.	FPGA Technologies		
45.	FPGA families- Altera Flex 8000 FPGA, Altera Flex 10		
46.	Xilinx XC4000 series FPGA ,Spartan II		
47.	Xilinx Spartan XL FPGA, Vertex FPGA		
48.	Case Studies: FPGA Implementation Of Half Adder		
49.	Case Studies: FPGA Implementation Of Full Adder		
50.	Logic synthesis		
51.	RTL synthesis, High level Synthesis		
UNIT - VI Introduction to Low Power VLSI Design **CO6: Student can design the basic models of FPGA for the typical applications of basic circuits.** **TB: T2: CMOS Digital Integrated Circuits Analysis and Design- Sung-Mo Kang, Yusuf Leblebici, Tata McGraw- Hill Education, 2003.**			
52.	Introduction to DIC design deep submicron digital	from 29-02-20 to 17-03-20	Lecture interspersed with discussions
53.	Over view of power consumption		
54.	Low –power design through voltage scaling		
55.	Estimation and optimization of switching activity		
56.	Reduction of switching capacitance		
57.	Interconnect Design		
58.	Power Grid and Clock Design		

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Date: 10/2/21

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TENTATIVE LESSON PLAN: R1632043

Course Title: VLSI DESIGN (R1632043)		
Section : B	Date : 18-11-2019	Page No : 01 of 03
Revision No : 00	Prepared By : K.VENKATESWARA RAO	Approved By : HOD

Tools: Black board, PPTs, Moodle

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT –I	**Introduction, Electrical properties**		
CO1: Student can understand the basic electrical properties			
TB : Kamran Eshraghian, Douglas and A. Pucknell and Sholeh Eshraghian, Prentice-Hall of India Private Limited, 2005 Edition" ESSENTIALS OF VLSI CIRCUITS AND SYSTEMS"			
1.	Introduction to IC technology, MOS related VLSI Technology, Basic MOS transistors	**from 18-11-19 to 05-12-19**	Lecture interspersed with discussions
2.	Enhancement and Depletion modes , IC production process		
3.	MOS and CMOS fabrication process		
4.	BiCMOS technology, comparison of CMOS & Bipolar		
5.	Ids versus Vds relationships		
6.	Aspects of MOS Vt , Trans & Output conductance		
7.	Pass transistor, NMOS inverter		
8.	Pull-Up to Pull-down ratio for NMOS inverter		
9.	driven by another NMOS inverter		
	Alternative forms of Pull-Ups		
10.	CMOS inverter , Circuit model,Bi-CMOS inverter		
11.	Latch up in CMOS , latchup susceptibility		
UNIT –II	**MOS & Bi-CMOS design Process**		
CO2: Able to develop designing methodologies of MOS devices			
TB: Kamran Eshraghian, Douglas and A. Pucknell and Sholeh Eshraghian, Prentice-Hall of India Private Limited, 2005 Edition" ESSENTIALS OF VLSI CIRCUITS AND SYSTEMS"			
12.	MOS layers	**from 10-12-19 to 20-12-19**	Lecture interspersed with discussions
13.	Stick diagrams		
14.	Design rules and layouts		
15.	General observations on design rules		
16.	2µm double metal double poly		
17.	CMOS/BiCMOS rules		
18.	1.2µm double metal double poly CMOS rules		
19.	Layout diagrams of NAND and NOR gates and CMOS inverters		
20	Symbolic diagrams-translation to mask forms		

TENTATIVE LESSON PLAN: R1632043

Course Title: VLSI DESIGN (R1632043)		
Section : B	Date : 18-11-2019	Page No : 02 of 03
Revision No : 00	Prepared By : : K.VENKATESWARA RAO	Approved By : HOD

Tools : Black board, PPTs

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT - III	**Basic circuit concepts**		
CO3: Able to interface the design methodologies with fabrication procedures.			
TB : Kamran Eshraghian, Douglas and A. Pucknell and Sholeh Eshraghian, Prentice-Hall of India Private Limited, 2005 Edition" ESSENTIALS OF VLSI CIRCUITS AND SYSTEMS"			
20.	Sheet resistance & application to MOS transistors and inverters	**from 19-12-19 to 27-01-20**	Lecture interspersed with discussions
21.	Area capacitance of layers		
22.	Standard unit of capacitance		
23.	Delay unit, Inverter delays		
24.	Propagation delays, wiring capacitances		
25.	Fan-in & Fan-Out characteristics , choice of layers		
26.	Transistor switches		
27.	Realization of gates using NMOS , PMOS and CMOS technologies		
28.	Scaling models, scaling factors for device parameters		
29.	Gate Logic ,Transmission gate		
30.	Limits due to sub-threshold currents		
31.	Current density limits on logic levels and supply voltages		
UNIT –IV	**Design for Testability ,Chip Input and Output circuits**		
CO4: Student can understand the advanced design procedures with partitioning.			
TB: T2: CMOS Digital Integrated Circuits Analysis and Design- Sung-Mo Kang, Yusuf Leblebici, Tata McGraw- Hill Education, 2003.			
32.	Fault types and Models	**from 29-01-20 to 05-02-20**	Lecture interspersed with discussions
33.	Controllability and Observability		
34.	Ad Hoc Testable Design Techniques		
35.	Built-In Self Test techniques ,Scan Based Techniques		
36.	ESD Protection, Input Circuits		
37.	Output Circuits and L(di /dt) Noise		
38.	On-Chip clock Generation and Distribution.		
UNIT –V	**FPGA Design**		
CO5: Ability to understand the constrains in the front end design of the circuits.			
TB: T2: CMOS Digital Integrated Circuits Analysis and Design- Sung-Mo Kang, Yusuf Leblebici, Tata McGraw- Hill Education, 2003..			
39.	FPGA design flow	10-02-20	Lecture interspersed with discussions

TENTATIVE LESSON PLAN: R1632043

Course Title: VLSI DESIGN (R1632043)		
Section : B	Date : 18-11-2019	Page No : 03 of 03
Revision No : 00	Prepared By : : K.VENKATESWARA RAO	Approved By : HOD

Tools : Black board, PPTs

No. of Periods	TOPIC	Date	Mode of Delivery
40.	Basic FPGA architecture, FPGA configuration	from 10-02-20 to 25-02-20	Lecture interspersed with discussions
41.	FPGA Technologies		
42.	FPGA families- Altera Flex 8000, Altera Flex10		
43.	Xilinx XC4000 series FPGA ,Spartan II		
44.	Xilinx Spartan XL FPGA, Vertex FPGA		
45.	Case Studies: FPGA Implementation Of Half Adder		
46.	Case Studies: FPGA Implementation Of Full Adder		
47.	Logic synthesis		
48.	RTL synthesis, High level Synthesis		
UNIT – VI Introduction to Low Power VLSI Design **CO6: Student can design the basic models of FPGA for the typical applications of basic circuits.** **TB: T2: CMOS Digital Integrated Circuits Analysis and Design- Sung-Mo Kang, Yusuf Leblebici, Tata McGraw- Hill Education, 2003.**			
49.	Introduction to Deep submicron digital IC design	from 29-02-20 to 20-03-20	Lecture interspersed with discussions
50.	Over view of power consumption		
51.	Low –power design through voltage scaling		
52.	Estimation and optimization of switching activity		
53.	Reduction of switching capacitance		
54.	Interconnect Design		
55.	Power Grid and Clock Design.		

Signature of the Faculty
Date: 16/11/20

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Signature of the HOD
Date: 17/11/20

TENTATIVE LESSON PLAN: R1632044
DIGITAL SIGNAL PROCESSING

Course Title: DIGITAL SIGNAL PROCESSING		
Section : Sec I	Date : 26/11/2019	Page No : 1 of 3
Revision No : 00	Prepared By : V. SEKHARA BABU	Approved By : HOD

Tools: Black board, PPTs

S.NO.	TOPIC	Date	Mode of Delivery
UNIT –I INTRODUCTION **CO1:: Estimate the spectra of signals that are to be processed by a discrete time filter, and to verify the performance of a variety of modern and classical spectrum estimation techniques** **TB1: Digital signal Processing by A.Anand Kumar,PHI**			
1	**Introduction to Digital Signal Processing**	**From: 26/11/19 To: 17/12/19**	Lecture interspersed with discussions
2	Discrete time signals		
3	Discrete time sequences		
4	Linear shift invariant systems		
5	Stability and causality		
6,7,8	Linear constant coefficient difference equations		
9	Frequency domain representation of discrete time signals		
10	Systems function		
11	Problems and tutorials		
UNIT –II DISCRETE FOURIER SERIES & FOURIER TRANSFORMS **CO2:: Able to Define and use Discrete Fourier Transforms (DFTs)** **TB1: Digital signal Processing by A.Anand Kumar,PHI**			
12	**Discrete Fourier Series & Fourier Transforms**	**From: 18/12/19 To: 31/12/19**	Lecture interspersed with discussions
23	Properties of discrete Fourier series		
14	DFS representation of periodic sequences		
15	Discrete Fourier transforms		
16	Properties of DFT		
17	Linear convolution of sequences using DFT		
18	Computation of DFT		
19,20	Fast Fourier transforms (FFT)		
21,22	Radix-2 decimation in time and decimation in frequency FFT Algorithms		
23	Inverse FFT		
24,25	Problems on FFT		

UNIT-III Design Of IIR Digital Filters& Realizations **CO3: Able to understand Design of IIR Digital filters and its applications.** **TB1: Digital signal Processing by A.Anand Kumar,PHI**			
26	**Design Of IIR Digital Filters& Realizations**	**From: 2/1/20 To: 10/1/20**	Lecture interspersed with discussions
27	Analog filter approximations		
28	Butter worth filter approximations		
29	Chebyshev filter approximations		
30	Design of IIR Digital filters from analog filters		
31,32	Design Examples		
33,34	Analog and Digital frequency transformations Basic structures of IIR systems		
35,36	Basic structures of IIR systems		
UNIT – IV Design Of FIR Digital Filters & Realizations **CO5:: able to understand the concepts FIR Digital Filter design** **TB1: Digital signal Processing by A.Anand Kumar,PHI**			
37	**Design Of FIR Digital Filters & Realizations**	**From: 27/1/20 To: 16/2/20**	Lecture interspersed with discussions
38	Characteristics of FIR Digital Filters		
39	Frequency response.		
40	Design of FIR Digital Filters using Window Techniques		
41	Frequency Sampling technique,		
42	Frequency response		
43	Design of FIR Digital Filters using Window Techniques		
44	Frequency Sampling technique		
45	Comparison of IIR & FIR filters		
46	Basic structures of FIR systems		
47	Lattice structures		
48	Lattice-ladder structures, tutorial		
UNIT –V MULTIRATE SIGNAL PROCESSING **CO5:: able to understand the concepts of Decimation, Interpolation** **TB1: Digital signal Processing by A.Anand Kumar,PHI**			
49	**Multirate Digital Signal Processing**	**From: 17/2/20 To: 28/2/20**	Lecture interspersed with discussions
50	Decimation		
51	Interpolation		
52	Sampling rate conversion		
53	Implementation of sampling rate conversion		
54	Sub-band Coding of Speech Signals		
55	Implementation of Digital Filter Banks		Lecture interspersed
56	Trans-multiplexers		

57	problems		with discussions
UNIT - VI INTRODUCTION TO DSP PROCESSORS **CO6 : Able to Program a DSP processor to filter signals** **TB1: Digital signal Processing by A.Anand Kumar,PHI**			
58	Introduction to programmable DSPs	**From: 1/3/20 To: 18/3/20**	Lecture interspersed with discussions
59	Multiplier and Multiplier Accumulator (MAC)		
59	Modified Bus Structures and Memory Access schemes in DSPs Multiple access memory		
60	Multiport memory		
60	VLSI architecture		
60	Pipelining		
60	Special addressing modes		
61	On-Chip Peripherals		
62	Architecture of TMS 320C5XIntroduction		
63	Bus Structure		
63	Central Arithmetic Logic Unit		
64	Auxiliary Register		
65	Index Register		
66	Block Move Address Register		
67	Parallel Logic Unit		
68	Memory mapped registers		
69	Program controller		
70	Some flags in the status registers		
71	On- chip registers		
72	On-chip peripherals		
73	Tutorials		

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TENTATIVE LESSON PLAN: R1632044
DIGITAL SIGNAL PROCESSING

Course Title: DIGITAL SIGNAL PROCESSING		
Section : Sec II	Date : 26/11/2019	Page No : 1 of 3
Revision No : 00	Prepared By : V. SEKHARA BABU	Approved By : HOD

Tools: Black board, PPTs

S.NO.	TOPIC	Date	Mode of Delivery
UNIT –I INTRODUCTION **CO1:: Estimate the spectra of signals that are to be processed by a discrete time filter, and to verify the performance of a variety of modern and classical spectrum estimation techniques** **TB1: Digital signal Processing by A.Anand Kumar,PHI**			
1	**Introduction to Digital Signal Processing**	**From: 27/11/19 To: 18/12/19**	Lecture interspersed with discussions
2	Discrete time signals		
3	Discrete time sequences		
4	Linear shift invariant systems		
5	Stability and causality		
6,7,8	Linear constant coefficient difference equations		
9	Frequency domain representation of discrete time signals		
10	Systems function		
11	Problems and tutorials		
UNIT –II DISCRETE FOURIER SERIES & FOURIER TRANSFORMS **CO2:: Able to Define and use Discrete Fourier Transforms (DFTs)** **TB1: Digital signal Processing by A.Anand Kumar,PHI**			
12	**Discrete Fourier Series & Fourier Transforms**	**From: 18/12/19 To: 30/12/19**	Lecture interspersed with discussions
23	Properties of discrete Fourier series		
14	DFS representation of periodic sequences		
15	Discrete Fourier transforms		
16	Properties of DFT		
17	Linear convolution of sequences using DFT		
18	Computation of DFT		
19,20	Fast Fourier transforms (FFT)		
21,22	Radix-2 decimation in time and decimation in frequency FFT Algorithms		
23	Inverse FFT		
24,25	Problems on FFT		

UNIT-III Design Of IIR Digital Filters& Realizations **CO3: Able to understand Design of IIR Digital filters and its applications.** **TB1: Digital signal Processing by A.Anand Kumar,PHI**			
26	**Design Of IIR Digital Filters& Realizations**	**From: 2/1/20 To: 11/1/20**	Lecture interspersed with discussions
27	Analog filter approximations		
28	Butter worth filter approximations		
29	Chebyshev filter approximations		
30	Design of IIR Digital filters from analog filters		
31,32	Design Examples		
33,34	Analog and Digital frequency transformations Basic structures of IIR systems		
35,36	Basic structures of IIR systems		
UNIT – IV Design Of FIR Digital Filters & Realizations **CO5:: able to understand the concepts FIR Digital Filter design** **TB1: Digital signal Processing by A.Anand Kumar,PHI**			
37	**Design Of FIR Digital Filters & Realizations**	**From: 26/1/20 To: 18/2/20**	Lecture interspersed with discussions
38	Characteristics of FIR Digital Filters		
39	Frequency response.		
40	Design of FIR Digital Filters using Window Techniques		
41	Frequency Sampling technique,		
42	Frequency response		
43	Design of FIR Digital Filters using Window Techniques		
44	Frequency Sampling technique		
45	Comparison of IIR & FIR filters		
46	Basic structures of FIR systems		
47	Lattice structures		
48	Lattice-ladder structures, tutorial		
UNIT –V MULTIRATE SIGNAL PROCESSING **CO5:: able to understand the concepts of Decimation, Interpolation** **TB1: Digital signal Processing by A.Anand Kumar,PHI**			
49	**Multirate Digital Signal Processing**	**From: 19/2/20 To: 28/2/20**	Lecture interspersed with discussions
50	Decimation		
51	Interpolation		
52	Sampling rate conversion		
53	Implementation of sampling rate conversion		
54	Sub-band Coding of Speech Signals		
55	Implementation of Digital Filter Banks		Lecture interspersed
56	Trans-multiplexers		

57	problems		with discussions
UNIT - VI INTRODUCTION TO DSP PROCESSORS **CO6 : Able to Program a DSP processor to filter signals** **TB1: Digital signal Processing by A.Anand Kumar,PHI**			
58	Introduction to programmable DSPs	**From: 1/3/20 To: 20/3/20**	Lecture interspersed with discussions
59	Multiplier and Multiplier Accumulator (MAC)		
59	Modified Bus Structures and Memory Access schemes in DSPs Multiple access memory		
60	Multiport memory		
60	VLSI architecture		
60	Pipelining		
60	Special addressing modes		
61	On-Chip Peripherals		
62	Architecture of TMS 320C5XIntroduction		
63	Bus Structure		
63	Central Arithmetic Logic Unit		
64	Auxiliary Register		
65	Index Register		
66	Block Move Address Register		
67	Parallel Logic Unit		
68	Memory mapped registers		
69	Program controller		
70	Some flags in the status registers		
71	On- chip registers		
72	On-chip peripherals		
73	Tutorials		

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TENTATIVE LESSON PLAN: R163204A

Course Title:OOPS Through JAVA		
Section :	Date:18-11-19	Page No: 1 of 3
Revision No:	Prepared by : CH SIVA RAJESH	Approved by :HOD

Tools : Black board, PPTs

No.of periods	Topics	Date	Mode of Delivery
UNIT-I Basics of Object Oriented Programming (OOP) **CO1 : Understand the basics of Programming** **TB:: Programming in JAVA, Sachin Malhotra, Saurabh Choudary, Oxford**			
1	Introduction to OOP	18-11-19	Lecture interspersed with discussions
2	procedural programming language	19-11-19	
3	object oriented language	20-11-19	
4	principles of OOP	21-11-19	
5	applications of OOP	22-11-19	
6	history of java	23-11-19	
7	java features	27-11-19	
8	JVM	29-11-19	
9	program structure	30-11-19	
10	Variables	12-03-2019	
11	primitive data types	12-04-2019	
12	identifiers	12-05-2019	
13	literals	12-06-2019	
14	operators	12-07-2019	
15	expressions	12-10-2019	
16	precedence rules and associativity	12-10-2019	
17	primitive type conversion and casting	12-11-2019	
18	flow of control	12-12-2019	
UNIT-II JAVA Basics **CO1 : Understand the basics of Programming** **TB:: Programming in JAVA, Sachin Malhotra, Saurabh Choudary, Oxford**			
19	Classes and objects	13/12/2019	Lecture interspersed with discussions
20	class declaration	13/12/2019	
21	creating objects	19/12/2019	
22	methods	19/12/2019	
23	constructors and constructor overloading	20/12/2019	
24	garbage collector	20/12/2019	
25	importance of static keyword and examples	21/12/2019	
26	this keyword	21/12/2019	
27	arrays	23/12/2019	
28	command line arguments	23/12/2019	
29	nested classes	26/12/2019	

UNIT-III Inheritance **CO1 : Understand the inheritance and its types** **TB:: Programming in JAVA, Sachin Malhotra, Saurabh Choudary, Oxford**			
30	Inheritance	27/12/2019	Lecture interspersed with discussions
31	types of inheritance	30/12/2019	
32	super keyword	31/12/2019	
33	final keyword	01-02-2020	
34	overriding and abstract class	01-03-2020	
35	Interfaces	01-04-2020	
36	creating the packages	01-04-2020	
37	using packages	01-06-2020	
38	importance of CLASSPATH	01-06-2020	
39	java.lang package	01-07-2020	
40	Exception handling	01-07-2020	
41	importance of try, catch	01-09-2020	
42	throw, throws and finally block	01-09-2020	
43	user-defined exceptions	01-10-2020	
44	Assertions.	28/1/2020	
UNIT-IV Multithreading and iostreams **CO1 : Understand the multithreading concepts & writing and reading data to/from the file.** **TB:: Programming in JAVA, Sachin Malhotra, Saurabh Choudary, Oxford**			
45	thread life cycle	29/1/2020	Lecture interspersed with discussions
46	creation of threads	30/1/2020	
47	thread priorities	02-05-2020	
48	thread synchronization	02-08-2020	
49	communication between threads	02-12-2020	
50	Reading data from files and writing data to files	14/2/2020	
51	random access file	15/2/2020	
UNIT-V Applets and Event Handling **CO1 : Understand the applet programming and event handling** **TB:: Programming in JAVA, Sachin Malhotra, Saurabh Choudary, Oxford**			
52	Applet class	16/2/2020	Lecture interspersed with discussions
53	Applet structure	20/2/2020	
54	Applet life cycle	25/2/2020	
55	sample Applet programs	26/2/2020	
56	event delegation model	26/2/2020	
57	sources of event	27/2/2020	
58	Event Listeners	29/2/2020	
59	adapter classes	03-03-2020	
60	inner classes	03-04-2020	
UNIT-VI AWT **: Understand the AWT components and listerner interfaces** **TB:: Programming in JAVA, Sachin Malhotra, Saurabh Choudary, Oxford**			**CO1**
61	components and containers	03-04-2020	

62	Button	03-05-2020	Lecture interspersed with discussions
63	Label	03-07-2020	
64	Checkbox	03-10-2020	
65	Radio Buttons	03-11-2020	
66	List Boxes	03-12-2020	
67	Choice Boxes	15/3/2020	
68	Container class	18/3/2020	
69	Layouts	19/3/2020	
70	Menu and Scrollbar	19/3/2020	

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TENTATIVE LESSON PLAN

BIO-MEDICAL ENGINEERING (R163204D)

Course Title: BIO-MEDICAL ENGINEERING (R163204D)		
Section : Sec I&II	**Date : 18/11/2019**	**Page No :** 01 of 04
Revision No : 00	**Prepared By : N.MAYURI**	**Approved By : HOD**

Tools: Black board, PPTs

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I INTRODUCTION TO BIOMEDICAL INSTRUMENTATION **CO1: Understand the origin of bio-potential and how to measure various physiological parameters from Human body** **TB: "Fundamentals of Bio-Medical Instrumentation", Onkar N. Pandey, 4th edition, katson Books.**			
1	Age of Biomedical Engineering, Development of Biomedical Instrumentation	18/11/2019	Lecture interspersed with discussions
2	Man Instrumentation System	19/11/2019	
3	Components of the Man-Instrument System	20/11/2019	
4	Problems Encountered in Measuring a Living System, Physiological System of the Body	21/11/2019	
5	TUTORIAL	22/11/2019	
6	Sources of Bioelectric Potentials	22/11/2019	
7	Muscle, Bioelectric Potentials	23/11/2019	
8	Resting and Action Potentials and Propagation	27/11/2019	
9	Bioelectric Potentials-ECG, EEG and EMG,	29/11/2019	
10	Envoked Responses	30/11/2019	
11	TUTORIAL	3/12/2019	
UNIT-II ELECTRODES AND TRANSDUCERS **CO2: Understand the principles involved in Electrodes and Transducers used to acquire different bio-potentials** **TB: "Fundamentals of Bio-Medical Instrumentation", Onkar N. Pandey, 4th edition, katson Books.**			
12	Introduction, Electrode Theory, Bio-potential Electrodes	5/12/2019	Lecture interspersed with discussions
13	Basic Transducer Principles,	6/12/2019	
14	Bio-chemical Transducers	7/12/2019	
15	Micro Electrodes, Examples of Electrodes	9/12/2019	
16	The Transducer and Transduction Principles,	10/12/2019	
17	Active Transducers, Passive Transducers	11/12/2019	
18	TUTORIAL	12/12/2019	

No. of Periods	TOPIC		Mode of Delivery
19	Transducers for Biomedical Applications	13/12/2019	
20	Pulse Sensors, Respiration Sensor	19/12/2019	
21	Transducers with Digital Output	20/12/2019	
22	TUTORIAL	21/12/2019	
UNIT-III CARDIOVASCULAR SYSTEM AND MEASUREMENTS AND MEASUREMENTS and MEASUREMENTS IN THE RESPIRATORY SYSTEM **CO3: Learn about the positioning and functioning of the cardiovascular system, measurement of parameters related to cardiology and Understand the basic knowledge about measurements of parameters related to Respiratory system** **TB: "Fundamentals of Bio-Medical Instrumentation", Onkar N. Pandey, 4th edition, katson Books.**			
23	The Heart and Cardiovascular System, Electro Cardiography	23/12/2019	Lecture interspersed with discussions
24	ECG Amplifiers, Electrodes, ECG Recorder principles	24/12/2019	
25	Types of ECG Recorders, single channel Recorder, Three channel Recorder	27/12/2019	
26	ECG for clinical applications, Blood Pressure Measurement	30/12/2019	
27	Measurement of Blood Flow & Cardiac Output	31/12/2019	
28	Measurement of Heart Sound, Plethysmography	2,3/1/2020	
29	The Physiology of The Respiratory System	4/1/2020	
30	Tests and Instrumentation for The Mechanics of Breathing	6,7/1/20	
31	Measurement of Residual volume, Respiratory Therapy Equipment	8,9/1/20	
32	TUTORIAL	10/1/20	
UNIT-IV PATIENT CARE AND MONITORING and THERAPEUTIC AND PROSTHETIC DEVICES **CO5: Gain knowledge about fundamental issues and elements of patient care in ICU and Organization of hospitals with quality care and Ability to understand diagnosis and therapy related equipments** **TB: "Fundamentals of Bio-Medical Instrumentation", Onkar N. Pandey, 4th edition, katson Books.**			
33	Elements of Intensive-Care Monitoring	28/1/2020	
34	Patient Monitoring Displays	29/1/2020	
35	Diagnosis, Calibration and Repair ability	30/1/2020	
36	Other Instrumentation for Monitoring Patients	31/1/2020	
37	Other Instrumentation for Monitoring Patients	1/2/2020	

No. of Periods	TOPIC	Date	Mode of Delivery
38	Organization of the Hospital for Patient-Care Monitoring, Pacemakers, Defibrillators	4/2/2020	Lecture interspersed with discussions
39	Therapeutic and Prosthetic Devices Introduction, Audiometers and Hearing Aids	5/2/2020	
40	Myoelectric Arm, Laparoscope, Ophthalmology Instruments	6/2/2020	
41	Anatomy of Vision, Electrophysiological Tests	7/2/2020	
42	Ophthalmoscope, Tonometer for Eye Pressure Measurement	8/2/2020	
43	Diathermy, Clinical Laboratory Instruments	11/2/2020	
44	Biomaterials, Stimulators	12/2/2020	
UNIT-V DIAGNOSTIC TECHNIQUES AND BIO-TELEMETRY **CO7: Learn Ultrasound imaging techniques and its usefulness in diagnosis and different types of radio diagnostic techniques** **TB: "Fundamentals of Bio-Medical Instrumentation", Onkar N. Pandey, 4th edition, katson Books.**			
45	Principles of Ultrasonic Measurement	12/2/2020	Lecture interspersed with discussions
46		13/2/2020	
47	Ultrasonic Imaging, Ultrasonic Applications of Therapeutic Uses	14/2/2020	
48	Ultrasonic Diagnosis	15/2/2020	
49	X-Ray and Radio-Isotope Instrumentations	18/2/2020	
50	CAT Scan	25/2/2020	
51	Emission Computerized Tomography	26/2/2020	
52	MRI	26/2/2020	
54	Introduction to Biotelemetry	27/2/2020	
55	Physiological Parameters Adaptable to Biotelemetry	29/2/2020	
55	The Components of Biotelemetry System	29/2/2020	
56	Implantable Units	3/3/2020	
57	Telemetry for ECG Measurements during , Telemetry for Emergency Patient Monitoring	4/3/2020	
UNIT-VI MONITORS, RECORDERS AND SHOCK HAZARDS **CO8: Understand the importance of patient safety against electrical hazard and functioning of Amplifiers, display devices and signal recorders** **TB: "Fundamentals of Bio-Medical Instrumentation", Onkar N. Pandey, 4th edition, katson Books.**			

No. of Periods	TOPIC	Date	Mode of Delivery
58	Bio potential Amplifiers ,Monitors	5/3/2020	
59	Recorders, Strip chart, Galvanometric Recorder	6/3/2020	
60	Potentiometric Recorder, UV Recorder	7/3/2020	Lecture interspersed with discussions
61	Electrostatic Recorder, Colour printer	10/3/2020	
62	Physiological Effects and Electrical Current,	11/3/2020	
63	Shock Hazards from Electrical Equipment	12/3/2020	
64	Methods of Accident Prevention	13/3/2020	
65	Isolated Power Distribution System	17/3/2020	
66	TUTORIAL	18/3/2020	
67	TUTORIAL	19/3/2020	

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environment and how operation takes place in mobile radio

TB: Mobile Cellular Telecommunications-W.C.Y. Lee, Tata McGraw Hill 2nd Edition, 2006.

1.	Introduction of cellular mobile systems	**18-11-19**	Lecture interspersed with discussions
2.	Spectrum efficiency considerations	**19-11-19**	
3.	Why 800 MHz and history of 800MHz	**20-11-19**	
4.	Trunking Efficiency and Basic cellular systems	**21-11-19**	
5.	Performance Criteria	**22-11-19**	
6.	Uniqueness of Mobile radio environment	**25-11-19**	
7.	Delay Spread, Coherence Bandwidth, direct wave path, line of sight path	**26-11-19**	
8.	Noise level in cellular system	**27-11-19**	
9.	Hexagonal shaped cells	**28-11-19**	
10.	Operation of cellular systems	**28-11-19**	
11.	Analog and Digital cellular systems	**28-11-19**	
12.	**Tutorial**	**29-11-19**	

ELEMENTS OF CELLULAR RADIO SYSTEMS DESIGN

CO1:: Be acquainted with the role of cellular and mobile communications in frequency management issues..

TB: Mobile Cellular Telecommunications-W.C.Y. Lee, Tata McGraw Hill 2nd Edition, 2006.

TB: Wireless Communications-Theodore. S. Rappaport, Pearson education

13.	General description of the problem	**4-12-19**	Lecture interspersed with discussions
14.	Concept of frequency reuse channels	**4-12-19**	
15.	Co-channel interference reduction factor	**5-12-19**	
16.	Desired C/I from a normal case in an Omnidirectional antenna systems	**5-12-19**	
17.	Handoff mechanism and cell splitting	**6-12-19**	
18.	Consideration of the components of cellular systems	**9-12-19**	
19.	**Tutorial**	**20-12-19**	

UNIT –II INTERFERENCE

CO2:: Be acquainted with different interference factors influencing cellular and mobile communications.

TB: Mobile Cellular Telecommunications-W.C.Y. Lee, Tata McGraw Hill 2nd Edition, 2006.

20.	Introduction of Cochannel Interference	**9-12-19**	
21.	Real time cochannel interference measurement at mobile radio transceivers	**10-12-19**	

31.	Near-end-Far-end interference		
32.	Interference between systems, UHF and long distance interference	**24-12-19**	
33.	**Tutorial**	**24-12-19**	

UNIT –III FREQUENCY MANAGEMENT AND CHANNEL ASSIGNMENT

CO3:: Be acquainted with the role of cellular and mobile communications in frequency management issues

TB:: Mobile Cellular Telecommunications-W.C.Y. Lee, Tata McGraw Hill 2nd Edition, 2006.

TB:: Wireless Communications-Theodore. S. Rappaport, Pearson education

No. of Periods	TOPIC	DATE	Mode of Delivery
34.	Frequency management: Numbering and grouping	**26-12-19**	Lecture interspersed with discussions
35.	Setup, access channels	**26-12-19**	
36.	Paging channels	**27-12-19**	
37.	Channel assignment to the cell site	**2-1-2020**	
38.	Fixed channel assignment, adjacent, channel sharing and borrowing	**2-1-2020**	
39.	Adjacent, channel sharing and borrowing	**2-1-2020**	
40.	Sectorization and overlaid cells	**6-1-2020**	

UNIT - III CELL COVERAGE FOR SIGNAL AND TRAFFIC

CO2:: Be able to efficiently use the background behind developing different path loss and/or radio coverage in cellular environment

TB: Mobile Cellular Telecommunications-W.C.Y. Lee, Tata McGraw Hill 2nd Edition, 2006.

No. of Periods	Tutorial	DATE	Mode of Delivery
41.	General introduction and problems	**6-1-2020**	Lecture interspersed with discussions
42.	Mobile point –to-point model (LEE model)	**6-1-2020**	
43.	Phase difference between a direct path and reflected path	**7-1-2020**	
44.	Constant standard deviation along apath loss slope and general formula for mobile radio propagation	**27-1-2020**	
45.	Propagation over water or flat open area	**28-1-2020**	

48.	Long distance propagation and form of a point –to-point model	**3-2-2020**	
49.	**Tutorial**	**3-2-2020**	

UNIT – IV CELLSITE AND MOBILE ANTENNAS

CO3:: Gain the understanding of cellsite antennas and mobile antennas

TB: Mobile Cellular Telecommunications-W.C.Y. Lee, Tata McGraw Hill 2nd Edition, 2006.

50.	Sum and difference patterns and their synthesis	**4-2-2020**	Lecture interspersed with discussions
51.	Omni directional antennas at cellsite	**5-2-2020**	
52.	Directional antennas for interference reduction	**11-2-2020**	
53.	Space diversity antennas	**13-2-2020**	
54.	Umbrella pattern antennas	**13-2-2020**	
55.	Unique situation at cellsite antennas	**18-2-2020**	
56.	Mobile roof mounted and glass mounted antennas and high gain antennas	**24-2-2020**	
57.	Horizontally and vertically oriented space diversity antennas	**24-2-2020**	
58.	**Tutorial**	**26-2-2020**	

UNIT – V HANDOFF AND DROPPED CALLS

CO5 :: Obtain the knowledge of different handoff techniques and how dropped calls exist

TB:: Mobile Cellular Telecommunications-W.C.Y. Lee, Tata McGraw Hill 2nd Edition, 2006.

TB:: Wireless Communications-Theodore. S. Rappaport, Pearson education

No. of Periods	TOPIC	DATE	Mode of Delivery
59.	Why handoffs, types of Handoffs and handoff initiation	**2-3-2020**	Lecture interspersed with discussions
60.	Delaying handoff and forced handoff		
61.	Mobile assisted handoff(MAHO)	**2-3-2020**	
62.	Cellsite handoffs and Intersystem handoff	**3-3-2020**	
63.	Cell splitting		
64.	Microcells	**4-3-2020**	
65.	Vehicle- locating methods	**5-3-2020**	
66.	Introduction to dropped call rate	**5-3-2020**	
67.	Formula of dropped call rate	**9-3-2020**	
68.	Problems	**10-3-2020**	
69.	Finding the values of Ω and μ	**10-3-2020**	
70.	**Tutorial**		

UNIT - VI DIGITAL CELLULAR NETWORKS

CO6 : Gain the knowledge of digital cellular networks in different generations.

TB:: Mobile Cellular Telecommunications-W.C.Y. Lee, Tata McGraw Hill 2nd Edition, 2006.

71.	GSM Architecture	**11-3-2020**	
72.	GSM Channels and Channel modes	**12-3-2020**	

TENTATIVE LESSON PLAN: R1642041

Course Title: CELLULAR AND MOBILE COMMUNICATIONS (R1642041)		
Section : Sec B	**Date : 11-11-2020**	**Page No :** 01 of 03
Revision No : 00	**Prepared By** : P. Ratna Bhaskar	**Approved By : HOD**

Tools: Black board, PPTs

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT –I	**CELLULAR MOBILE RADIO SYSTEMS**		
CO1:: Introducing cellular mobile radio systems and how operation takes place in mobile radio environment			
TB: Mobile Cellular Telecommunications-W.C.Y. Lee, Tata McGraw Hill 2nd Edition, 2006.			
1.	Introduction of cellular mobile systems	**18-11-19**	Lecture interspersed with discussions
2.	Spectrum efficiency considerations	**19-11-19**	
3.	Why 800 MHz and history of 800MHz	**20-11-19**	
4.	Trunking Efficiency and Basic cellular systems	**21-11-19**	
5.	Performance Criteria	**22-11-19**	
6.	Uniqueness of Mobile radio environment	**22-11-19**	
7.	Delay Spread, Coherence Bandwidth, direct wave path, line of sight path	**25-11-19**	
8.	Noise level in cellular system	**26-11-19**	
9.	Hexagonal shaped cells	**27-11-19**	
10.	Operation of cellular systems	**28-11-19**	
11.	Analog and Digital cellular systems	**28-11-19**	
12.	**Tutorial**	**29-11-19**	
ELEMENTS OF CELLULAR RADIO SYSTEMS DESIGN			
CO1:: Be acquainted with the role of cellular and mobile communications in frequency management issues..			
TB: Mobile Cellular Telecommunications-W.C.Y. Lee, Tata McGraw Hill 2nd Edition, 2006.			
TB: Wireless Communications-Theodore. S. Rappaport, Pearson education			
13.	General description of the problem	**4-12-19**	Lecture interspersed with discussions
14.	Concept of frequency reuse channels	**5-12-19**	
15.	Co-channel interference reduction factor	**5-12-19**	
16.	Desired C/I from a normal case in an Omnidirectional antenna systems	**6-12-19**	
17.	Handoff mechanism and cell splitting	**6-12-19**	
18.	Consideration of the components of cellular systems	**9-12-19**	
19.	**Tutorial**	**9-12-19**	
UNIT –II	**INTERFERENCE**		
CO2:: Be acquainted with different interference factors influencing cellular and mobile communications.			
TB: Mobile Cellular Telecommunications-W.C.Y. Lee, Tata McGraw Hill 2nd Edition, 2006.			
20.	Introduction of Cochannel Interference	**9-12-19**	
21.	Real time cochannel interference measurement at mobile radio transceivers	**10-12-19**	

22.	Design of Omnidirectional antenna in a worst case	**11-12-19**	Lecture interspersed with discussions
23.	Design of a directional antenna system	**11-12-19**	
24.	Lowering the antenna height	**13-12-19**	
25.	Notch in a tilted antenna pattern	**16-12-19**	
26.	Umbrella pattern effect	**16-12-19**	
27.	Use of parasitic elements	**17-12-19**	
28.	Diversity receiver		
29.	Types of non-Cochannel interference	**19-12-19**	
30.	Adjacent channel interference		
31.	Near-end-Far-end interference	**23-12-19**	
32.	Interference between systems, UHF and long distance interference		
33.	**Tutorial**	**24-12-19**	

UNIT –III FREQUENCY MANAGEMENT AND CHANNEL ASSIGNMENT

CO3:: Be acquainted with the role of cellular and mobile communications in frequency management issues

TB:: Mobile Cellular Telecommunications-W.C.Y. Lee, Tata McGraw Hill 2nd Edition, 2006.

TB:: Wireless Communications-Theodore. S. Rappaport, Pearson education

No. of Periods	TOPIC	DATE	Mode of Delivery
34.	Frequency management: Numbering and grouping	**26-12-19**	Lecture interspersed with discussions
35.	Setup, access channels	**27-12-19**	
36.	Paging channels	**27-12-19**	
37.	Channel assignment to the cell site	**2-1-2020**	
38.	Fixed channel assignment, adjacent, channel sharing and borrowing	**2-1-2020**	
39.	Adjacent, channel sharing and borrowing	**6-1-2020**	
40.	Sectorization and overlaid cells	**6-1-2020**	

UNIT - III CELL COVERAGE FOR SIGNAL AND TRAFFIC

CO2:: Be able to efficiently use the background behind developing different path loss and/or radio coverage in cellular environment

TB: Mobile Cellular Telecommunications-W.C.Y. Lee, Tata McGraw Hill 2nd Edition, 2006.

No. of Periods	Tutorial	DATE	Mode of Delivery
41.	General introduction and problems	**7-1-2020**	Lecture interspersed with discussions
42.	Mobile point –to-point model (LEE model)	**7-1-2020**	
43.	Phase difference between a direct path and reflected path	**7-1-2020**	
44.	Constant standard deviation along apath loss slope and general formula for mobile radio propagation	**27-1-2020**	
45.	Propagation over water or flat open area	**28-1-2020**	

46.	Land to mobile transmission over water and problems	**28-1-2020**	
47.	Foliage loss and propagation in Near –in distance	**29-1-2020**	
48.	Long distance propagation and form of a point –to-point model	**3-2-2020**	
49.	**Tutorial**	**4-2-2020**	

UNIT – IV CELLSITE AND MOBILE ANTENNAS

CO3:: Gain the understanding of cellsite antennas and mobile antennas

TB: Mobile Cellular Telecommunications-W.C.Y. Lee, Tata McGraw Hill 2nd Edition, 2006.

50.	Sum and difference patterns and their synthesis	**4-2-2020**	Lecture interspersed with discussions
51.	Omni directional antennas at cellsite	**5-2-2020**	
52.	Directional antennas for interference reduction	**11-2-2020**	
53.	Space diversity antennas	**11-2-2020**	
54.	Umbrella pattern antennas	**13-2-2020**	
55.	Unique situation at cellsite antennas	**18-2-2020**	
56.	Mobile roof mounted and glass mounted antennas and high gain antennas	**24-2-2020**	
57.	Horizontally and vertically oriented space diversity antennas	**26-2-2020**	
58.	**Tutorial**	**26-2-2020**	

UNIT – V HANDOFF AND DROPPED CALLS

CO5 :: Obtain the knowledge of different handoff techniques and how dropped calls exist

TB:: Mobile Cellular Telecommunications-W.C.Y. Lee, Tata McGraw Hill 2nd Edition, 2006.

TB:: Wireless Communications-Theodore. S. Rappaport, Pearson education

No. of Periods	TOPIC	DATE	Mode of Delivery
59.	Why handoffs, types of Handoffs and handoff initiation	**2-3-2020**	Lecture interspersed with discussions
60.	Delaying handoff and forced handoff		
61.	Mobile assisted handoff(MAHO)	**3-3-2020**	
62.	Cellsite handoffs and Intersystem handoff	**3-3-2020**	
63.	Cell splitting		
64.	Microcells	**4-3-2020**	
65.	Vehicle- locating methods	**5-3-2020**	
66.	Introduction to dropped call rate	**5-3-2020**	
67.	Formula of dropped call rate	**9-3-2020**	
68.	Problems	**9-3-2020**	
69.	Finding the values of Ω and μ	**10-3-2020**	
70.	**Tutorial**		

UNIT - VI DIGITAL CELLULAR NETWORKS

CO6 : Gain the knowledge of digital cellular networks in different generations.

TB:: Mobile Cellular Telecommunications-W.C.Y. Lee, Tata McGraw Hill 2nd Edition, 2006.

71.	GSM Architecture	**11-3-2020**	
72.	GSM Channels and Channel modes	**12-3-2020**	

73.	Multiple access scheme	**12-3-2020**	Lecture interspersed with discussions
74.	TDMA	**16-3-2020**	
75.	TDMA channel bursts and training sequence	**17-3-2020**	
76.	CDMA	**17-3-2020**	
77.	OFDMA	**18-3-2020**	
78.	Architecture of 3G cellular systems.	**18-3-2020**	
79.	**Tutorial**	**18-3-2020**	

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TENTATIVE LESSON PLAN: R1642042

Course Title: ELECTRONIC MEASUREMENTS AND INSTRUMENTATION **(R1642042)**		
Section : Sec A	**Date : 18-11-2019**	**Page No :** 01 of 03
Revision No : 00	**Prepared By :** P. RAVEENDRA	**Approved By : HOD**

Tools: Black board, PPTs

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT –I			
CO1:: Select the instrument to be used based on the requirements.			
TB: Electronic instrumentation, second edition - H.S.Kalsi, Tata McGraw Hill, 2004.			
1.	Performance characteristics of instruments	FROM: 18-11-19	Lecture interspersed with discussions
2.	Static characteristics Accuracy, Resolution, Precision		
3.	Expected value, Error, Sensitivity Errors in Measurement		
4.	Expected value, Error, Sensitivity Errors in Measurement		
5.	Dynamic Characteristics-speed of response		
6.	Fidelity, Lag and Dynamic error.		
7.	Dynamic Characteristics-speed of response		
8.	Fidelity, Lag and Dynamic error.		
9.	DC Voltmeters- Multi-range		
10.	DC Voltmeters- Multi-range		
11.	Range extension/Solid state and differential voltmeters		
12.	**Tutorial**	TO: 09-12-19	
13.	AC voltmeters- multi range, range extension		Lecture interspersed with discussions
14.	Shunt Thermo couple type RF ammeter		
15.	Ohmmeters series type, shunt type		
16.	Multimeter for Voltage, Current and resistance elements		
17.	**Tutorial**		
UNIT – II			
CO2:: Understand and analyze different signal generators and analyzers			
TB: Electronic instrumentation, second edition - H.S.Kalsi, Tata McGraw Hill, 2004.			
18.	Signal Generator- fixed and variable	FROM: 10-12-19	Lecture interspersed with discussions
19.	AF oscillators, AF sine wave signal generators		
20.	AF square wave signal generators		
21.	Function Generators Square pulse, Random noise		
22.	Sweep generator		
23.	Arbitrary waveform generator		
24.	Wave Analyzers		
25.	Harmonic Distortion Analyzers		
26.	Spectrum Analyzers		
27.	Digital Fourier Analyzers	TO: 17-12-19	
28.	**Tutorial**		

UNIT – III

CO3:: Understand the design of oscilloscopes for different applications

TB: Electronic instrumentation, second edition - H.S.Kalsi, Tata McGraw Hill, 2004.

29.	Oscilloscopes CRT features ,vertical amplifiers	FROM: 18-12-19 TO: 07-01-20	Lecture interspersed with discussions
30.	horizontal deflection system		
31.	sweep, trigger pulse, delay line		
32.	sync selector circuits, simple CRO		
33.	Triggered sweep CRO		
34.	Dual beam CRO ,Dual trace oscilloscope		
35.	Sampling oscilloscope,		
36.	storage oscilloscope		
37.	digital readout oscilloscope, DSO		
38.	Lissajous method of frequency measurement		
39.	Standard specifications of CRO		
40.	probes for CRO- Active & Passive, attenuator type		
41.	**Tutorial**		

UNIT –IV

CO4:: Use AC and DC bridges for relevant parameter measurement

TB:: Electronic instrumentation, second edition - H.S.Kalsi, Tata McGraw Hill, 2004.

42.	AC Bridges Measurement of inductance-Maxwell's bridge.	FROM: 28-01-20 TO: 18-02-20	Lecture interspersed with discussions
43.	Anderson bridge.		
44.	Measurement of capacitance -Shearing Bridge		
45.	Wheat stone bridge		
46.	Wien's Bridge		
47.	Errors and precautions in using bridges		
48.	Q-meter.		
49.	**Tutorial**		

UNIT – V

CO5 :: Design different transducers for measurement of different parameters

TB:: Electronic instrumentation, second edition - H.S.Kalsi, Tata McGraw Hill, 2004.

No. of Periods	TOPIC	DATE	Mode of Delivery
50.	Transducers	FROM: 24-02-20 TO: 28-02-20	Lecture interspersed with discussions
51.	active & passive transducers		
52.	Resistance, Capacitance,		
53.	inductance		
54.	Strain gauges		
55.	LVDT		
56.	Piezo Electric transducers		
57.	Resistance Thermometers		
58.	Thermocouples		
59.	Thermistors		

60.	Sensistors		
61.	**Tutorial**		

UNIT - VI

CO6 : Design different transducers for measurement of different parameters

TB:: Electronic Measurements & Instrumentations by K. Lal Kishore, Pearson Education - 2005.

62.	Measurement of physical parameters	FROM: 02-03-20	
63.	Measurement of force		
64.	Measurement of pressure, velocity		
65.	Measurement of humidity, moisture		
66.	Measurement of SPEED, proximity	TO: 09-03-20	Lecture interspersed with discussions
67.	Measurement of SPEED, proximity		
68.	Measurement of Displacement		
69.	Data acquisition systems		
70.	Data acquisition systems		
71.	**Tutorial**		

TB1:: Electronic instrumentation, second edition - H.S.Kalsi, Tata McGraw Hill, 2004.

TB2:: Electronic Measurements & Instrumentations by K. Lal Kishore, Pearson Education - 2005.

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S. Sri Gauri
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TENTATIVE LESSON PLAN: R1642042

Course Title: ELECTRONIC MEASUREMENTS AND INSTRUMENTATION **(R1642042)**		
Section : Sec B	**Date : 18-11-2019**	**Page No :** 01 of 03
Revision No : 00	**Prepared By** : P. RAVEENDRA	**Approved By : HOD**

Tools: Black board, PPTs

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT –I			
CO1:: Select the instrument to be used based on the requirements.			
TB: Electronic instrumentation, second edition - H.S.Kalsi, Tata McGraw Hill, 2004.			
1.	Performance characteristics of instruments	FROM: 18-11-19	Lecture interspersed with discussions
2.	Static characteristics Accuracy, Resolution, Precision		
3.	Expected value, Error, Sensitivity Errors in Measurement		
4.	Expected value, Error, Sensitivity Errors in Measurement		
5.	Dynamic Characteristics-speed of response		
6.	Fidelity, Lag and Dynamic error.		
7.	Dynamic Characteristics-speed of response		
8.	Fidelity, Lag and Dynamic error.		
9.	DC Voltmeters- Multi-range		
10.	DC Voltmeters- Multi-range		
11.	Range extension/Solid state and differential voltmeters		
12.	**Tutorial**	TO: 09-12-19	
13.	AC voltmeters- multi range, range extension		Lecture interspersed with discussions
14.	Shunt Thermo couple type RF ammeter		
15.	Ohmmeters series type, shunt type		
16.	Multimeter for Voltage, Current and resistance elements		
17.	**Tutorial**		
UNIT – II			
CO2:: Understand and analyze different signal generators and analyzers			
TB: Electronic instrumentation, second edition - H.S.Kalsi, Tata McGraw Hill, 2004.			
18.	Signal Generator- fixed and variable	FROM: 10-12-19	Lecture interspersed with discussions
19.	AF oscillators, AF sine wave signal generators		
20.	AF square wave signal generators		
21.	Function Generators Square pulse, Random noise		
22.	Sweep generator		
23.	Arbitrary waveform generator		
24.	Wave Analyzers		
25.	Harmonic Distortion Analyzers		
26.	Spectrum Analyzers		
27.	Digital Fourier Analyzers	TO: 17-12-19	
28.	**Tutorial**		

UNIT – III

CO3:: Understand the design of oscilloscopes for different applications

TB: Electronic instrumentation, second edition - H.S.Kalsi, Tata McGraw Hill, 2004.

29.	Oscilloscopes CRT features ,vertical amplifiers	FROM: 18-12-19 TO: 07-01-20	Lecture interspersed with discussions
30.	horizontal deflection system		
31.	sweep, trigger pulse, delay line		
32.	sync selector circuits, simple CRO		
33.	Triggered sweep CRO		
34.	Dual beam CRO ,Dual trace oscilloscope		
35.	Sampling oscilloscope,		
36.	storage oscilloscope		
37.	digital readout oscilloscope, DSO		
38.	Lissajous method of frequency measurement		
39.	Standard specifications of CRO		
40.	probes for CRO- Active & Passive, attenuator type		
41.	**Tutorial**		

UNIT –IV

CO4:: Use AC and DC bridges for relevant parameter measurement

TB:: Electronic instrumentation, second edition - H.S.Kalsi, Tata McGraw Hill, 2004.

42.	AC Bridges Measurement of inductance- Maxwell's bridge.	FROM: 28-01-20 TO: 18-02-20	Lecture interspersed with discussions
43.	Anderson bridge.		
44.	Measurement of capacitance -Shearing Bridge		
45.	Wheat stone bridge		
46.	Wien's Bridge		
47.	Errors and precautions in using bridges		
48.	Q-meter.		
49.	**Tutorial**		

UNIT – V

CO5 :: Design different transducers for measurement of different parameters

TB:: Electronic instrumentation, second edition - H.S.Kalsi, Tata McGraw Hill, 2004.

No. of Periods	TOPIC	DATE	Mode of Delivery
50.	Transducers	FROM: 24-02-20 TO: 28-02-20	Lecture interspersed with discussions
51.	active & passive transducers		
52.	Resistance, Capacitance,		
53.	inductance		
54.	Strain gauges		
55.	LVDT		
56.	Piezo Electric transducers		
57.	Resistance Thermometers		
58.	Thermocouples		
59.	Thermistors		

60.	Sensistors		
61.	**Tutorial**		

UNIT - VI

CO6 : Design different transducers for measurement of different parameters

TB:: Electronic Measurements & Instrumentations by K. Lal Kishore, Pearson Education - 2005.

62.	Measurement of physical parameters	FROM: 02-03-20	Lecture interspersed with discussions
63.	Measurement of force		
64.	Measurement of pressure, velocity		
65.	Measurement of humidity, moisture		
66.	Measurement of SPEED, proximity	TO: 09-03-20	
67.	Measurement of SPEED, proximity		
68.	Measurement of Displacement		
69.	Data acquisition systems		
70.	Data acquisition systems		
71.	**Tutorial**		

TB1:: Electronic instrumentation, second edition - H.S.Kalsi, Tata McGraw Hill, 2004.

TB2:: Electronic Measurements & Instrumentations by K. Lal Kishore, Pearson Education - 2005.

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TENTATIVE LESSON PLAN: R1642043

Course Title: Satellite Communications		
Section: IVECE-A	Date :18-11-2019	Page No : 01 of 03
Revision No : 00	Prepared By : V. SRILAKSHMI	Approved By : HOD

Tools : Black board, PPTs,

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT –I	**INTRODUCTION, ORBITAL MECHANICS AND LAUNCHERS**		
CO 1: student will be introduced to Understand the basic concepts, applications, frequencies used and types of satellite communications & the concept of look angles, launches and launch vehicles and orbital effects in satellite communications.			
T1: Satellite Communications – Timothy Pratt, Charles Bostian and Jeremy Allnutt, WSE, Wiley Publications, 2nd Edition, 2003.			
T2: Satellite Communications Engineering – Wilbur L. Pritchard, Robert A Nelson and Henri G.Suyderhoud, 2nd Edition, Pearson Publications, 2003.			
1.	Origin of Satellite Communications	18-11-2019	Lecture interspersed with discussions
2.	Historical Back-ground	19-11-2019	
3.	Basic Concepts of Satellite Communications	20-11-2019	
4.	Frequency allocations for Satellite services	21-11-2019	
5.	Applications	25-11-2019	
6.	Future Trends of Satellite Communications	26-11-2019	
7.	Tutorial	27-11-2019	
8.	Orbital Mechanics	28-11-2019	
9.	Look Angle determination	02-12-2019	
10.	Orbital perturbations	03-12-2019	
11.	Orbit determination	04-12-2019	
12.	launches and launch vehicles	05-12-2019	
13.	Orbital effects in communication systems performance	09-12-2019	
14.	Tutorial	10-12-2019	
UNIT –II	**SATELLITE SUBSYSTEMS**		
CO 2: Student can understand about various satellite subsystems and its functionality.			
T1: Satellite Communications – Timothy Pratt, Charles Bostian and Jeremy Allnutt, WSE, Wiley Publications, 2nd Edition, 2003.			
15.	Attitude and orbit control system	11-12-2019	Lecture interspersed with discussions
16.	Telemetry, Tracking, Command and monitoring	12-12-2019	
17.	power systems	16-12-2019	
18.	communication subsystems	17-12-2019	
19.	Satellite antennas	18-12-2019	
20.	Equipment reliability and Space qualification	19-12-2019	
21.	**Tutorial**	23-12-2019	
UNIT - III	**SATELLITE LINK DESIGN**		
CO 3: Student can understand the concepts of satellite link design and calculation of C/N ratio.			
T1: Satellite Communications – Timothy Pratt, Charles Bostian and Jeremy Allnutt, WSE, Wiley Publications, 2nd Edition, 2003.			
22.	Basic transmission theory	24-12-2019	
23.	system noise temperature and G/T ratio	26-12-2019	
24.	Design of down links	30-12-2019	
25.	Design of down links	31-12-2019	
26.	up link design	02-01-2020	

27.	up link design	06-01-2020	
28.	Design of satellite links for specified C/N	07-01-2020	
29.	**Tutorial**	08-01-2020	
30.	System design example	09-01-2020	
31.	System design example	18-01-2020	

No. of Periods	TOPIC	DATE	Mode of Delivery
UNIT - IV MULTIPLE ACCESS **CO 4: Student can understand the concepts of multiple access and various types of multiple access techniques in satellite systems.** **T1:** Satellite Communications – Timothy Pratt, Charles Bostian and Jeremy Allnutt, WSE, Wiley Publications, 2nd Edition, 2003.			
32.	Frequency division multiple access (FDMA)	27-01-2020	Lecture interspersed with discussions
33.	Intermodulation	28-01-2020	
34.	Calculation of C/N	29-01-2020	
35.	Time division Multiple Access (TDMA)	30-01-2020	
36.	Frame structure	03-02-2020	
37.	Examples	04-02-2020	
38.	Satellite Switched TDMA	05-02-2020	
39.	Onboard processing	06-02-2020	
40.	DAMA	10-02-2020	
41.	**Tutorial**	11-02-2020	
42.	Code Division Multiple access (CDMA)	12-02-2020	
43.	Spread spectrum transmission and reception	13-02-2020	
UNIT – V EARTH STATION TECHNOLOGY & LOW EARTH ORBIT AND GEO-STATIONARY SATELLITE SYSTEMS **CO 5: student can understand the concepts of Earth Station Technology & Low Earth Orbit and Geo-Stationary satellite systems.** **T1:** Satellite Communications – Timothy Pratt, Charles Bostian and Jeremy Allnutt, WSE, Wiley Publications, 2nd Edition, 2003. **T2:** Satellite Communications Engineering – Wilbur L. Pritchard, Robert A Nelson and Henri G.Suyderhoud, 2nd Edition, Pearson Publications, 2003.			
43.	Introduction	17-02-2020	Lecture interspersed with discussions
44.	Transmitters	18-02-2020	
45.	Receivers	19-02-2020	
46.	Antennas	20-02-2020	
47.	Tracking systems	24-02-2020	
48.	Terrestrial interface	25-02-2020	
49.	**Tutorial**	26-02-2020	
50.	Orbit consideration	27-02-2020	
51.	coverage and frequency considerations	02-03-2020	
52.	Delay & Throughput considerations	03-03-2020	
53.	Delay & Throughput considerations	04-03-2020	
54.	System considerations	05-03-2020	
55.	Operational NGSO constellation Designs	10-03-2020	
56.	**Tutorial**	11-03-2020	

UNIT – VI SATELLITE NAVIGATION & THE GLOBAL POSITIONING SYSTEM **CO 6: Student can understand the concepts of satellite navigation, architecture and applications of GPS.** **T1:** Satellite Communications – Timothy Pratt, Charles Bostian and Jeremy Allnutt, WSE, Wiley Publications, 2nd Edition, 2003.			
57.	Radio and Satellite Navigation	12-03-2020	Lecture interspersed with discussions
58.	GPS Position Location principles	16-03-2020	
59.	GPS Receivers and codes	17-03-2020	
60.	Satellite signal acquisition, GPS Navigation Message	18-03-2020	
61.	GPS signal levels, GPS receiver operation	19-03-2020	
62.	GPS C/A code accuracy, Differential GPS	19-03-2020	

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S. Sri Gowri

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LESSON PLAN: R1642043

Course Title: Satellite Communications		
Section: IVECE-B	Date :18-11-2019	Page No : 01 of 03
Revision No : 00	Prepared By : V. SRILAKSHMI	Approved By : HOD

Tools : Black board, PPTs,

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT –I	**INTRODUCTION, ORBITAL MECHANICS AND LAUNCHERS**		
CO 1: student will be introduced to Understand the basic concepts, applications, frequencies used and types of satellite communications & the concept of look angles, launches and launch vehicles and orbital effects in satellite communications.			
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T2: Satellite Communications Engineering – Wilbur L. Pritchard, Robert A Nelson and Henri G.Suyderhoud, 2nd Edition, Pearson Publications, 2003.			
1.	Origin of Satellite Communications	18-11-2019	Lecture interspersed with discussions
2.	Historical Back-ground	19-11-2019	
3.	Basic Concepts of Satellite Communications	19-11-2019	
4.	Frequency allocations for Satellite services	20-11-2019	
5.	Applications	25-11-2019	
6.	Future Trends of Satellite Communications	26-11-2019	
7.	Tutorial	26-11-2019	
8.	Orbital Mechanics	27-11-2019	
9.	Look Angle determination	02-12-2019	
10.	Orbital perturbations	03-12-2019	
11.	Orbit determination	03-12-2019	
12.	launches and launch vehicles	04-12-2019	
13.	Orbital effects in communication systems performance	09-12-2019	
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UNIT –II	**SATELLITE SUBSYSTEMS**		
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15.	Attitude and orbit control system	10-12-2019	Lecture interspersed with discussions
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17.	power systems	16-12-2019	
18.	communication subsystems	17-12-2019	
19.	Satellite antennas	17-12-2019	
20.	Equipment reliability and Space qualification	18-12-2019	
21.	**Tutorial**	23-12-2019	
UNIT - III	**SATELLITE LINK DESIGN**		
CO 3: Student can understand the concepts of satellite link design and calculation of C/N ratio.			
T1: Satellite Communications – Timothy Pratt, Charles Bostian and Jeremy Allnutt, WSE, Wiley Publications, 2nd Edition, 2003.			
22.	Basic transmission theory	24-12-2019	
23.	system noise temperature and G/T ratio	24-12-2019	
24.	Design of down links	30-12-2019	
25.	Design of down links	31-12-2019	
26.	up link design	31-12-2019	

27.	up link design	06-01-2020	
28.	Design of satellite links for specified C/N	07-01-2020	
29.	**Tutorial**	07-01-2020	
30.	System design example	08-01-2020	
31.	System design example	18-01-2020	

No. of Periods	TOPIC	DATE	Mode of Delivery
UNIT - IV MULTIPLE ACCESS **CO 4: Student can understand the concepts of multiple access and various types of multiple access techniques in satellite systems.** **T1:** Satellite Communications – Timothy Pratt, Charles Bostian and Jeremy Allnutt, WSE, Wiley Publications, 2nd Edition, 2003.			
32.	Frequency division multiple access (FDMA)	27-01-2020	Lecture interspersed with discussions
33.	Intermodulation	28-01-2020	
34.	Calculation of C/N	28-01-2020	
35.	Time division Multiple Access (TDMA)	29-01-2020	
36.	Frame structure	03-02-2020	
37.	Examples	04-02-2020	
38.	Satellite Switched TDMA	04-02-2020	
39.	Onboard processing	05-02-2020	
40.	DAMA	10-02-2020	
41.	**Tutorial**	11-02-2020	
42.	Code Division Multiple access (CDMA)	11-02-2020	
43.	Spread spectrum transmission and reception	12-02-2020	
UNIT – V EARTH STATION TECHNOLOGY & LOW EARTH ORBIT AND GEO-STATIONARY SATELLITE SYSTEMS **CO 5: student can understand the concepts of Earth Station Technology & Low Earth Orbit and Geo-Stationary satellite systems.** **T1:** Satellite Communications – Timothy Pratt, Charles Bostian and Jeremy Allnutt, WSE, Wiley Publications, 2nd Edition, 2003. **T2:** Satellite Communications Engineering – Wilbur L. Pritchard, Robert A Nelson and Henri G.Suyderhoud, 2nd Edition, Pearson Publications, 2003.			
43.	Introduction	17-02-2020	Lecture interspersed with discussions
44.	Transmitters	18-02-2020	
45.	Receivers	18-02-2020	
46.	Antennas	19-02-2020	
47.	Tracking systems	24-02-2020	
48.	Terrestrial interface	25-02-2020	
49.	**Tutorial**	25-02-2020	
50.	Orbit consideration	26-02-2020	
51.	coverage and frequency considerations	02-03-2020	
52.	Delay & Throughput considerations	03-03-2020	
53.	Delay & Throughput considerations	03-03-2020	
54.	System considerations	04-03-2020	
55.	Operational NGSO constellation Designs	10-03-2020	
56.	**Tutorial**	10-03-2020	

UNIT – VI SATELLITE NAVIGATION & THE GLOBAL POSITIONING SYSTEM			
CO 6: Student can understand the concepts of satellite navigation, architecture and applications of GPS.			
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58.	GPS Position Location principles	16-03-2020	
59.	GPS Receivers and codes	17-03-2020	
60.	Satellite signal acquisition, GPS Navigation Message	17-03-2020	
61.	GPS signal levels, GPS receiver operation	18-03-2020	
62.	GPS C/A code accuracy, Differential GPS	19-03-2020	

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S. Sri Gouri

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TENTATIVE LESSON PLAN: RT42044A

Course Title: WIRELESS SENSOR NETWORKS (RT42044A)		
Section : Sec A	Date : 19-11-19	Page No : 01 of 03
Revision No :	Prepared By : S.NEERAJA	Approved By : HOD

Tools: Black board, PPT

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT –I OVERVIEW OF WIRELESS SENSOR NETWORKS **CO1:** To understand basics of Wireless Sensor Networks and challenges faced in designing Sensor nodes and Wireless Sensor Networks. TB: Feng Zhao & Leonidas J. Guibas, "Wireless Sensor Networks- An Information Processing Approach", Elsevier, 2007.			
1	Key definitions of sensor networks	19-11-19	Lecture interspersed with discussions
2	Advantages of sensor Networks and Driving Applications	19-11-19	
3	Unique constraints an challenges	20-11-19	
4	Enabling Technologies for Wireless Sensor Networks	23-11-18	
5	Single-Node Architecture - Hardware Components, Energy Consumption of Sensor Nodes	26,29-11-19	
6	Operating Systems and Execution Environments	30-11-19	
7	Network Architecture -Sensor Network Scenarios	30-11-19	
8	Optimization Goals and Figures of Merit, Gateway Concepts	03-12-19	
9	Single-Node Architecture - Hardware Components, Energy Consumption of Sensor Nodes	30-11-19, 03-12-19	
11	**Tutorial**	05-12-19	
UNIT-II NETWORKING Technologies **CO2:** To understand PANs, MANETs and WANETs. **TB:** Ad Hoc Wireless Networks: Architectures and Protocols - C. Siva Ram Murthy and B.S.Manoj, 2004, PHI			
12	Physical Layer and Transceiver Design Considerations	05,06, 07-12-19	Lecture interspersed with discussions
13	Personal area network (PAN), it's topology	12-12-19	
14	Hidden node and exposed node problem	10-12-19	
15	Topologies of MANETs, WANETs	12-12-19	
16	**Tutorial**	19-12-19	
UNIT-III MAC Protocols for Wireless Sensor Networks **CO3:** To understand the issues in designing MAC protocol for WSN and to know different MAC protocols used for WSN. **TB:** Ad Hoc Wireless Networks: Architectures and Protocols - C. Siva Ram Murthy and B.S.Manoj, 2004, PHI			
17	Issues in Designing a MAC protocol for Ad Hoc Wireless Networks	19-12-19	Lecture interspersed with discussions
18	Design goals of a MAC Protocol for Ad Hoc Wireless Networks	19-12-19	
19	Classifications of MAC Protocols,	20-12-19	
20	Contention - Based Protocols	20-12-19	
21	Contention - Based Protocols	21-12-19	
22	Contention - Based Protocols	26,28-12-19	
23	Contention - Based Protocols with reservation Mechanisms	04-01-20	
24	Contention - Based Protocols with reservation Mechanisms	21-01-20	
25	Contention - Based Protocols with reservation Mechanisms	23-01-20	
26	Contention – Based MAC Protocols with Scheduling Mechanisms	23-01-20	
27	Contention – Based MAC Protocols with Scheduling Mechanisms	24-01-20	

No. of Periods	TOPIC	Date	Mode of Delivery
28	MAC Protocols that use Directional Antennas	24-01-20	Lecture interspersed with discussions
30	Other MAC Protocols - **Tutorial**	25-01-20	
UNIT-IV ROUTING PROTOCOLS **CO4: T**o understand the issues in designing routing protocol for WSN and to know different routing protocols used for WSN. **TB:** Ad Hoc Wireless Networks: Architectures and Protocols - C. Siva Ram Murthy and B.S.Manoj, 2004, PHI			
32	Introduction, Issues in Designing a Routing Protocol for Ad Hoc Wireless Networks	29-01-20	Lecture interspersed with discussions
33	Classification of Routing Protocols	29-01-20	
34	Table –Driven Routing Protocols	07-02-20	
35	Table –Driven Routing Protocols	08-02-20	
36	On – Demand Routing Protocols	14-02-20	
37	On – Demand Routing Protocols	14-02-20	
39	Hybrid Routing Protocols	19-02-20	
40	Routing Protocols with Efficient Flooding Mechanisms	18-02-20	
41	Hierarchical Routing Protocols	20-02-20	
43	Power – Aware Routing Protocols	21-02-20	
44	Proactive Routing-**Tutorial**	07-02-20	
UNIT-V TRANSPORT LAYER AND SECURITY PROTOCOLS **CO6:** To understand the issues in designing transport layer and security protocol for WSN and to know different transport layer and security protocols used for WSN. **TB:** Ad Hoc Wireless Networks: Architectures and Protocols - C. Siva Ram Murthy and B.S.Manoj, 2004, PHI			
46	Introduction	22-02-20	Lecture interspersed with discussions
47	Issues in Designing a Transport Layer Protocol	25-02-20	
48	Design Goals of a Transport Layer Protocol for Ad Hoc Wireless Networks	27-02-20	
49	Classification of Transport Layer Solutions	28-02-20	
50	TCP Over Ad Hoc Wireless Networks	01-03-20	
51	TCP Over Ad Hoc Wireless Networks	01-03-20	
52	Other Transport Layer Protocol for Ad Hoc Wireless Networks	06-03-20	
53	**Tutorial**	07-03-20	
UNIT- VI SECURITY IN AD HOC WIRELESS NETWORKS, SENSOR NETWORK PLATFORMS AND TOOLS, APPLICATIONS OF WSN **CO7:** To understand types of security attacks in WSN and to design protocols providing security in wireless sensor networks. To understand sensor network platforms and to understand some applications of WSN **TB:** Ad Hoc Wireless Networks: Architectures and Protocols - C. Siva Ram Murthy and B.S.Manoj, 2004, PHI			
54	Network Security Requirements	11-03-20	Lecture interspersed with discussions
55	Issues and Challenges in Security Provisioning	11-03-20	
56	Network Security Attacks, Key Management	12-03-20	
57	Secure Routing in Ad Hoc Wireless Networks	13-03-20	
58	Sensor Node Hardware – Berkeley Motes	15-03-20	
No. of Periods	**TOPIC**	**Date**	**Mode of Delivery**
59	Programming Challenges	18-03-20	Lecture
60	Node-level software platforms, Node-level Simulators	18-03-20	

61	State-centric programming	18-03-20	interspersed with discussions
62	APPLICATIONS of WSN: Ultra wide band radio communication	19-03-20	
63	Wireless fidelity systems, Future directions	20-03-20	
64	Home automation, smart metering	20-03-20	
65	Tutorial	23-03-20	

Signature of the Faculty

S. Sri Gowri

Signature of the HOD

PRINCIPAL
SRK Institute of Technology
ENIKEPADU, VIJAYAWADA-521 108

TENTATIVE LESSON PLAN: RT42044A

Course Title: WIRELESS SENSOR NETWORKS (RT42044A)		
Section : Sec B	Date : 20-11-19	Page No : 01 of 03
Revision No :	Prepared By : S.NEERAJA	Approved By : HOD

Tools: Black board, PPT

No. of Periods	TOPIC	Date	Mode of Delivery
UNIT –I OVERVIEW OF WIRELESS SENSOR NETWORKS **CO1:** To understand basics of Wireless Sensor Networks and challenges faced in designing Sensor nodes and Wireless Sensor Networks. TB: Feng Zhao & Leonidas J. Guibas, "Wireless Sensor Networks- An Information Processing Approach", Elsevier, 2007.			
1	Key definitions of sensor networks	20-11-19	Lecture interspersed with discussions
2	Advantages of sensor Networks and Driving Applications	20-11-19	
3	Unique constraints an challenges		
4	Enabling Technologies for Wireless Sensor Networks	23-11-18	
5	Single-Node Architecture - Hardware Components, Energy Consumption of Sensor Nodes	26-11-19	
6	Operating Systems and Execution Environments	30-11-19	
7	Network Architecture -Sensor Network Scenarios	30-11-19	
8	Optimization Goals and Figures of Merit, Gateway Concepts	03-12-19	
9	Single-Node Architecture - Hardware Components, Energy Consumption of Sensor Nodes	30-11-19, 03-12-19	
11	**Tutorial**	04-12-19	
UNIT-II NETWORKING Technologies **CO2:** To understand PANs, MANETs and WANETs. **TB:** Ad Hoc Wireless Networks: Architectures and Protocols - C. Siva Ram Murthy and B.S.Manoj, 2004, PHI			
12	Physical Layer and Transceiver Design Considerations	06, 07-12-19	Lecture interspersed with discussions
13	Personal area network (PAN), it's topology	12-12-19	
14	Hidden node and exposed node problem	10-12-19	
15	Topologies of MANETs, WANETs	12-12-19	
16	**Tutorial**	18-12-19	
UNIT-III MAC Protocols for Wireless Sensor Networks **CO3:** To understand the issues in designing MAC protocol for WSN and to know different MAC protocols used for WSN. **TB:** Ad Hoc Wireless Networks: Architectures and Protocols - C. Siva Ram Murthy and B.S.Manoj, 2004, PHI			
17	Issues in Designing a MAC protocol for Ad Hoc Wireless Networks	19-12-19	Lecture interspersed with discussions
18	Design goals of a MAC Protocol for Ad Hoc Wireless Networks	19-12-19	
19	Classifications of MAC Protocols,	20-12-19	
20	Contention - Based Protocols	20-12-19	
21	Contention - Based Protocols	21-12-19	
22	Contention - Based Protocols	26,28-12-19	
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43	Power – Aware Routing Protocols	21-02-20	
44	Proactive Routing-**Tutorial**	06-02-20	
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53	**Tutorial**	07-03-20	
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64	Home automation, smart metering	20-03-20	
65	Tutorial	21-03-20	

Signature of the Faculty

S. Sri Gowri

Signature of the HOD

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