

GOPALAN COLLEGE OF ENGINEERING AND MANAGEMENT

Department of Electronics and Communication

Academic Year: **2016-17**

Semester: **EVEN**

COURSE PLAN

Semester: **IV**

Subject Code & Name: **15EC44 & Signals and Systems**

Name of Subject Teacher: **Guruprasad. K. V**

Name of Subject Expert (Reviewer): **Kavitha M.V**

For the Period: From: 06-02-17 to 02-06-17

Details of Book to be referred:

Text Books	T1: Simon Haykins and Barry Van Veen, “Signals and Systems”, 2nd Edition, 2008, Wiley India. ISBN 9971-51-239-4
Reference Books	<p>R1: Michael Roberts, “Fundamentals of Signals & Systems”, 2nd edition, Tata McGraw-Hill, 2010, ISBN 978-0-07-07221-9.</p> <p>R2: Alan V Oppenheim, Alan S, Willsky and A Hamid Nawab, “Signals and Systems” Pearson Education Asia / PHI, 2nd edition, 1997. Indian Reprint 2002.</p> <p>R3: H. P Hsu, R. Ranjan, “Signals and Systems”, Scham’s outlines, TMH, 2006.</p> <p>R4: B. P. Lathi, “Linear Systems and Signals”, Oxford University Press, 2005.</p> <p>R5: Ganesh Rao and SatishTunga, “Signals and Systems”, Pearson/Sanguine Technical Publishers, 2004.</p>

Lecture NO	Topic Planned	Practical Applications & Brief objectives	Book referred with Pg No.	Planned Date	Executed Date	Deviation Reasons thereof	How Made Good / Reciprocate arrangement	Remarks by HOD
1.	Introduction to the subject	<p>Objectives: To discuss the fundamentals of signals and systems. Brief about Types & Classification of various signals and systems. Representation of various signals and operation on signals</p> <p>Applications: Used in Radio broadcasting, TV broad casting, communication systems, Frequency analyzers, function generators, spectrum analyzer and many other communication systems.</p>						
2.	MODULE -1 Introduction and Classification of signals.		T1:Simon Haykins & Barry Veen (1-1)	06-02-17	06-02-17	Nil		
3.	Definition of signal and systems, communication and control systems as examples.		R3: Ganesh Rao (1-2)	07-02-17	07-02-17	Nil		
4.	Sampling of analog signals, Continuous time signal, Discrete time signal							
5.	Sampling of analog signals, Continuous time signal, Discrete time signal		R3: Ganesh Rao (1-3)	08-02-17	08-02-17	Nil		
6.	Classification of signals: Even & odd, Periodic & Non-periodic		R3: Ganesh Rao (1-5)	09-02-17	09-02-17	Nil		
7.	Deterministic & Non-deterministic, Energy & Power signals.		R3: Ganesh Rao (1-5)	10-02-17	10-02-17	Nil		
8.	Operations on signals: Amplitude scaling, addition, multiplication, differentiation, integration		T1:Simon Haykins(15)	13-02-17	13-02-17	Nil		
9.	Its properties and examples		Ganesh Rao (1-21)	14-02-17	14-02-17	Nil		
10.	Elementary signals: Exponential, Sine, impulse, Step, Ramp, Rectangular, Triangular, Signum, Sync functions		Ganesh Rao (1-25)	15-02-17	15-02-17	Nil		

11.	Time scaling, Time shifting and Time folding	Outcomes: The students will be able to know the concept of signals & systems. To know how to represent various signals and their operations.	Ganesh Rao (1-27)	16-02-17				
12.	Systems: Definition & Classification: linear and nonlinear.		T1:Sim Haykins, (73)	17-02-17				
13.	Time variant and invariant,		Ganesh Rao (1-29)	20-02-17				
14.	Causal and non-causal		Ganesh Rao (1-30)	21-02-17				
15.	Static and Dynamic,		Ganesh Rao (1-32)	22-02-17				
16.	Stable and Unstable, invertible.		Ganesh Rao (1-34)	23-02-17				
17.	Time variant and invariant.		Ganesh Rao (1-35)	25-02-17				
18.	Numerical problems		Ganesh Rao (1-45)	27-02-17				
19.	Numerical problems (continued)		Ganesh Rao (1-50)	28-02-17				
20.	MODULE -2 Time domain representation of LTI System	Objectives: To discuss the complete representation of LTI systems and study its properties.	Ganesh Rao (2-1)	01-03-17				
21.	System modeling		Ganesh Rao (2-4)	02-03-17				
22.	Input-output relationship		Ganesh Rao (2-5)	03-03-17				
23.	Definition of Impulse response, convolution sum with examples		Ganesh Rao (2-7)	04-03-17				

24.	Convolution Integrals, examples.	<p>Applications: Used signal processing at Base stations in Telephony, mobile applications</p> <p>Outcomes: The student will be able to understand the Convolution sum and Convolution Integrals for various signals and to know their representations.</p>	Ganesh Rao (2-10)	06-03-17				
25.	Computation of CI & CS using graphical method		Ganesh Rao (2-15)	07-03-17				
ii)	For Unit step – Unit step		Ganesh Rao (2-19)	08-03-17				
26.	For Unit step - Exponential		Ganesh Rao (2-23)	13-03-17				
iii)	For Unit Exponential - Exponential		Ganesh Rao (2-27)	14-03-17				
27.	For Unit step - Rectangle		Ganesh Rao (2-29)	15-03-17				
28.	For Rectangle- Rectangle		Ganesh Rao (2-30)	16-03-17				
29.	Properties of convolution		Ganesh Rao (2-34)	17-03-17				
30.	Properties of convolution (conti)		Ganesh Rao (2-36)	20-03-17				
31.	Numerical problems on convolution		Ganesh Rao (2-37)	21-03-17				
32.	UNIT TEST-1			22-03-17				
33.	MODULE – 3 Introduction to System interconnections		<p>Objectives: To discuss of various types of signal analysis methods for infinite</p>	Ganesh Rao (3-1)	23-03-17			
34.	System properties in terms of Impulse response	Ganesh Rao (3-2)		27-03-17				
35.	Step response in terms of Impulse response	Ganesh Rao (3-4)		28-03-17				
36.	Numericals	Ganesh Rao (3-5)		30-03-17				

37.	Fourier Representation of Periodic Signals	values of time period, analyzing, methods and techniques for CTS & DTS. Outcomes: Student will be able to understand analysis. Applications: Used in various communication systems, used in Modulation techniques, etc.	Ganesh Rao (3-17)	31-03-17				
38.	Introduction to CTFS & DTFS		Ganesh Rao (3-19)	01-04-17				
39.	Definitions and Properties		Ganesh Rao (3-21)	03-04-17				
40.	Basic Numerical problems on CTFS		Ganesh Rao (3-22)	04-04-17				
41.	Basic Numerical problems on DTFS		Ganesh Rao (3-27)	05-04-17				
42.	UNIT TEST -2			06-04-17				
43.	MODULE – 4 Fourier Representation of Aperiodic Signals	Objectives: To know the basics of Fourier Transforms, evaluations techniques and applying to the various signals like CTS, DTS, Impulse signal etc. Applications: Communication systems, Broadcasting etc.	Ganesh Rao (4-1)	07-03-17				
44.	FT representation of aperiodic CT signals – FT, Definition		Ganesh Rao (4-2)	10-04-17				
45.	FT of standard CT signal		Ganesh Rao (4-4)	11-04-17				
46.	Properties and their significance		Ganesh Rao (4-5)	12-04-17				
47.	FT representation of aperiodic discrete signals DTF		Ganesh Rao (4-7)	13-04-17				
48.	Definition, properties of standard discrete signal		Ganesh Rao (4-9)	20-04-17				
49.	Properties and their significance		Ganesh Rao (4-11)	21-04-17				
50.	Impulse sampling and reconstruction		Ganesh Rao (4-14)	24-04-17				

51.	Sampling Theorem	Outcomes: student will be able to understand to reconstruction of signal, analysis at receiver by using sampling technique.	Ganesh Rao (4-15)	25-04-17				
52.	Reconstruction of signals		Ganesh Rao (4-16)	26-04-17				
53.	Numerical problems		Ganesh Rao (4-17)	27-04-17				
54.	MODULE - 5 Z-Transforms, Fundamental concepts	Objectives: To discuss the various types of signal analysis methods for infinite values of time period, analyzing methods and techniques for Z-Transformations. Applications: Used in various communication systems, used in Modulation techniques, Digital modulations etc. Outcomes: Student will be able to understand analysis.	Ganesh Rao (5-1)	28-04-17				
55.	Introduction to Z-Transforms		Ganesh Rao (5-2)	02-05-17				
56.	Properties of Region of convergence, Transform analysis of LTI systems		Ganesh Rao (5-5)	03-05-17				
57.	Properties of the Z-Transform,		Ganesh Rao (5-12)	04-05-17				
58.	Inversion of the Z-Transform		Ganesh Rao (5-22)	06-05-17				
59.	Numerical problems		Ganesh Rao (5-25)	08-05-17				
60.	Transform analysis of LTI systems		Ganesh Rao (5-31)	09-05-17				
61.	Numerical on Z-Transformations	Ganesh Rao (5-42)	10-05-17					
62.	UNIT TEST- 3			11-05-17				

63.	Numerical on transform analysis of LTI systems		Ganesh Rao (5-52)	12-05-17				
64.	Numerical on Inverse Z-Transforms		Ganesh Rao (5-57)	20-05-17				
65.	Revision and QP solving			21-05-17				
66.	Revision and QP solving			22-05-17				
67.	Revision and QP solving			23-05-17				
68.	Revision and QP solving			24-05-17				
69.	Revision and QP solving			25-05-17				
70.	Revision and QP solving			29-05-17				
71.	Revision and QP solving			30-05-17				
72.	Revision and QP solving			01-06-17				

Prepared By: _____
 (Faculty)
 Date & Sign _____

Reviewed by: _____
 (Sub. expert)
 Date & Sign _____

Approved by: _____
 (HOD)
 Date & Sign _____

Approved by: _____
 (Principal/ Acad. Co)
 Date & Sign _____