Lesson Planning Presentation

Academic years 2013-2014 (Old) Even Semesters
Term Duration: From Jan 2014 To April 2014

Name of the Teacher : **Mr. Kadam M M**
Designation   : Asst. Professor
Department   : EXTC

1. Name of the subject: **Signals and Systems**

2. Class/ Course /Sem: S. E. / EXTC/IV

3. Scheme of Instruction:

Theory	Practical	Tutorials	
4 Hrs	---	01	Periods / Week

4. Scheme of Examination:

	Theory paper	(Duration)	Practical	Oral	T.W.	Total
Max Marks	100	3 Hrs	--	--	25	125

5. Aims & Objective of teaching the subject.

   Part (1)   Aims & Objective (Course objectives)

   CO1 : To introduce students to the idea of signal and system analysis and characterization in time and frequency domain.
   CO2 : To provide foundation of signal and system concepts to areas like communication, control and comprehend applications of signal processing in communication systems.

Part (2)   Subject importance w.r.t. Engineering profession

> This course trains students for an intermediate level of fluency with signals and systems in both continuous time and discrete time, in preparation for more advanced subjects in digital signal processing (including audio, image and video processing), communication theory, and system theory, control, and robotics.
> This course will help to predict, with some certainty, the behavior of the systems when an engineer is subject to different signals. The mathematical approach also allow to design electrical circuit or algorithms that will operate on signals in such a way so as to produce desirable outcomes.

Part (3)   Expertise obtained after completion of the subject

> Students will be able to understand significance of signals and systems in the time and frequency domains.
> Students will be able to interpret and analyze signal and report results.
> Students will be able to evaluate the time and frequency response of continuous and discrete time, system which is useful in understanding behavior of Electronics circuits and communication systems.

6. Pre-requisites for teaching the subject.

Para (1)   Knowledge already acquired by studying related Subjects.

ETS : 301 - Applied Mathematics III
ETC : 304 - Circuits and Transmission Lines

Para (2)   Inter- disciplinary & inter subject correlation of various topics to be covered – (Only introduction)

(One correlation of various topics / subjects, more emphasis is to be given while teaching a particular topic).

Linear Time Invariant (LTI) systems, Discrete Time Fourier Transform (DTFT) and Z-Transform

7. Lecture –Wise Lesson planning Details.
(Please Refer University syllabus for division of subject into units.) :-

Lect. No.	Unit No.	Topics / COs	Subtopics	Teaching aids & Methodology	Text Book /References / website used.	Planned Dates	Actual Dates of completion	HOD Remark
1	1	Overview of signals and systems /CO1	Signals, Systems, Examples of systems for Controls and Communication	Blackboard ,DigiClass, quiz, group discussion,pres entation	Rodger E Ziemer, William H. Tranter and D. Ronald Fannin, Signals and Systems, Alan V. Oppenhiem, Alan S. Willsky and S. Hamid Nawab, Signals and Systems, Michael J Roberts, Fundamentals of Signals and systems	8/01/15		
2		Elementary signals,/CO1	sine, step, impulse, ramp, exponential, rectangular, triangular and			12/01/15		
3		Operations on signals/CO1	Modification of time axis : Time Reversal, Time Shifting and Time Scaling			13/01/15		
4		Sampling theorem/ CO1	Explanation & sampling of continuous time signals			14/01/15		
5		Classification of signals / CO1	Continuous and discrete time, deterministic and non deterministic, periodic and aperiodic,			15/01/15		
6			Symmetric (even) and asymmetric (odd), energy and power, causal and anti-causal signals.			19/01/15		
7-8	2	Classification of systems/ CO1	Static and dynamic, time variant and time invariant, linear and nonlinear, Causal and noncausal, stable and unstable systems.	Blackboard ,DigiClass, quiz, group discussion,pres entation	Rodger E Ziemer, William H. Tranter and D. Ronald Fannin, Signals and Systems, Alan V. Oppenhiem, Alan S. Willsky and S. Hamid Nawab, Signals and Systems, Michael J Roberts, Fundamentals of Signals and systems	20,21/01/15		
9-10						22,27		
11-12		Linear Time Invariant (LTI) systems CO1/	Representation of systems using differential /difference equation, Impulse, step and exponential response, system stability, examples on applications of LTI systems			28,29		
13-14						2,3/02/15		
15-16		System Response CO1/	impulse response of interconnected systems, total response of a system			4,5		
17-18		Convolution and correlation/ CO1	Convolution auto-correlation, cross correlation, Properties of correlation Analogy between correlation and convolution,			9,10/02/15		

Lecture	Module	Topic	Content	Teaching Method	Reference	Date		
19	3	Laplace Transform CO1	Overview of: Laplace Transform and properties,	Blackboard ,DigiClass, quiz, group discussion,pres entation	Nagoor Kani, Signals and Systems	11/02/15		
20			Relation between continuous time Fourier Transform and Laplace Transform, unilateral Laplace Transform.		V. Krishnaveni and A.Rajeshwari, Signals and Systems	12/02/15		
21-22		Analysis of continuous time LTI systems using Laplace Transform/C 01/CO2	Transfer Function, causality and stability of systems,			23,24/02/1 5		
23-24			Solution of differential equation using Laplace Transform.			25,26/02/1 5		
25	4	Z-Transform/ C01/CO2	Z-Transform of finite and infinite duration sequences,	Blackboard ,DigiClass, quiz, group discussion,pres entation	Simon Haykin and Barry Van Veen, Signals and Sytems	2/03/15		
26-27			Relation between DTFT and z-Transform. Relation between Laplace Transform and z–Transform.			3,4/03/15		
28-29			Properties of Z-Transform and Inverse z-Transform and Numerals		B.P. Lathi, Principles of Linear Systems and Signals	5,9/03/15		
30			One sided z–Transform.			10/03/15		
31-32		Analysis of discrete time LTI systems using z-Transform/ C01/CO2	Transfer Function, causality and stability of systems, frequency response			11,12/03/1 5		
33-34	5	Fourier series of continuous and discrete time signals C01/CO2/	Trigonometric and exponential Fourier series	Blackboard ,DigiClass, quiz, group discussion,pres entation	B.P. Lathi, Principles of Linear Systems and Signals	16/03/15		
35-36			Representation of signals, magnitude and phase spectra, power spectral density and bandwidth.		Alan V. Oppenhiem, Alan S. Willsky and S. Hamid Nawab, Signals and Systems	18,23/03/1 5		
37-38		Properties of Fourier Series/ C01/CO2	Linearity, time reversal, time shifting, frequency shifting & Numerical			24,2503/15		
39-40			Time scaling, differentiation, symmetry. Parsevel's relation & Numerical.			26/03/15		
41-42			Examples based on properties, analogy between Continuous Time Fourier Series (CTFS) and Discrete Time Fourier Series (DTFS).			06/04/15		
43	6	Continuous Time Fourier Transform	Fourier Transform on periodic and non-periodic signals	Blackboard ,DigiClass, quiz, group discussion,pres	B.P. Lathi, Principles of Linear Systems and Signals	07/04/15		
44			Inverse Fourier Transform on periodic and non-periodic signals			08/04/15		

		(CTFT) and Discrete Time Fourier Transform (DTFT) / C01/CO2	Limitations of Fourier Transform and need for Laplace and z-Transform	entation	Alan V. Oppenhiem, Alan S. Willsky and S. Hamid Nawab, Signals and Systems	**7/04/15**		
45								
46-47		Properties of Fourier Transform C01/CO2/	Linearity, time shifting, time reversal, frequency shifting, time and frequency scaling			**8/04/15**		
48-49			Modulation, convolution in time domain, symmetry.			**9/04/15**		
50			Differentiation in time domain, differentiation in frequency domain,			**13/04/15**		
51-52			Parsevel's relation. Energy, power spectral density and bandwidth. Definition and problems on DTFT			**14/04/15**		

Total No. of periods hrs. Required for planned lectures = 52

8.　　Planning details of special / revision lectures during the course : (The special
　　　　　lectures may be   beyond the scope of the syllabus given but may be required
　　　　　for the the sake of completeness for better understanding of the subjects.

Sp Rev. Lr	Scheduled After Lr. No.	Topics to be covered	T. Aid proposed	Reference Used.

No.				
1	18	Real Life Applications	Blackboard Chalk , Duster, DigiClass	NA
2	37	Doubt clearing	Blackboard Chalk , Duster, DigiClass	NA
3*	During Semester	Guest Speaker		
4*	During Semester	NPTEL Lecture on Any syllabus topic		

* Subject to availability of time and resources

Total No of periods (hrs) required for sq/ Rev. Lectures. = 04

9.   Planning details of Assignments to be given:
            No of assignments to be given = 08

10.   Planning details of units Tests/ prelim. Exam.

Unit Test No.	After Completion of % syllabus.	Tentative Date for tests	
		To be Held on	Declaration of Result on.
1	40	28/02/2015	07/03/2015
2	90	11/04/2015	15/04/2015

11.   Result Analysis of Unit Test / prelim Exam.

     Corrective measure to be taken : An extra coaching can be arrange between 17/04/2015/ to 24/04/2015
     (please elaborate & given planning details if extra coaching is required).
      After college working hours, an extra coaching can given to week student (between 5-6 pm)

12.   Result expected in University Examination
       a)   Last years result of the subject: _____62_____ %
       b)   Result expected this year : 75%
13.   Proposed Date of Submission of Final Term work / Journals. : 15/04/2015

14.   Observation and Remarks: (Please specify if extra period are required for completion of course other than the period available as per scheduled time tables). No

Mapping of POs and COs

Name of the Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
Name of faculty : Dr. Imdad Rizvi											
CO1	S	S	S	W	W	S	W			W	S
CO2	S	S	W	W	W	S	S				S

Signature of Teacher

Date of submission of plan: 05/01/2015

Signature of HOD

Annexure :

Text books
    1. Nagoor Kani, Signals and Systems, Tata McGraw Hill, Third Edition, 2011.

2. B.P. Lathi, Principles of Linear Systems and Signals, Oxford, Second Edition, 2010.
3. Simon Haykin and Barry Van Veen, Signals and Sytems, John Wiley and Sons,
   Second Edition, 2004.

Reference books

1) Hwei. P Hsu, Signals and Systems, Tata McGraw Hill, Third edition, 2010
2) V. Krishnaveni and A.Rajeshwari, Signals and Systems, Wiley-India, First Edition 2012.
3) Narayana Iyer, Signals and Systems, Cenage Learning, First Edition 2011.
4) Michael J Roberts, Fundamentals of Signals and systems, Tata McGraw Hill,
   special Indian Economy edition, 2009.
5) Rodger E Ziemer, William H. Tranter and D. Ronald Fannin, Signals and Systems, Pearson Education, Fourth Edition 2009.
6) Alan V. Oppenhiem, Alan S. Willsky and S. Hamid Nawab, Signals and Systems,
   Prentice-Hall of India, Second Edition, 2002.

Other references used.

➢ IIT Bombay NPTEL website
http://www.cdeep.iitb.ac.in/nptel/Electrical%20%26%20Comm%20Engg/Signals%20and%20System/Course%20Objective.htm

➢ MIT Center for Advanced Engineering Studies.
http://ocw.mit.edu/resources/res-6-007-signals-and-systems-spring-2011/

➢ Georgia Institute of Technology's worked Problems
http://users.ece.gatech.edu/~bonnie/book/worked_problems.html

➢ IIT Guwahati virtual Lab
http://iitg.vlab.co.in/?sub=59&brch=166