

LECTURER GUIDANCE and DETAIL DESCRIPTION

Subject : DIGITAL SIGNAL PROCESSING  
Code Number : TIF208  
Program : S-1 Teknik Informatika  
Credit Semester : 3 (three)

Studying and Learning Process

a. The lecturers : Explain, give examples, discuss, give assignments / homework

b. The students : Listen, study, active in discussion and do the assignments / homework, presentation

Media :  
a. LCD Projector  
b. White Board  
c. Text Book  
d. Handout  
e. Note book

Evaluation :  
a. Mid-Term Test (UTS) = 30%  
b. Final Test (UAS) = 40%  
c. Class Discussion / Participation, Assignments/Quiz/ Pretest = 30%

Main Reference :  
[1] Jonathan Stein, "Digital Signal Processing: A Computer Science Perspective", John Wiley & Sons, 2000  
[2] Steven Smith, "The Scientist and Engineer's Guide to Digital Signal Processing", California Technical Publishing, Downloadable at <http://www.dspguide.com/pdfbook.htm>

Additional :  
Emmanuel C. Ifeakor and Barrie W. Jervis, "Digi  
Sanjit K. Mitra and James F. Kaiser, "Handbook for Digital Si  
PA Lynn and W Fuerst, "Introductory Digital Signal Processir  
Supporting tools:  
• Matlab or Octave – <http://octave-gtk.sourceforge.net>  
• Audacity – <http://www.audacityteam.org>  
• Python – <http://python.org>

Learning and Teaching Guidance for General Objective

- 1 Pre-Test
- 2 Brainstorming
- 3 Evaluation

Types of delivery the Specific Objectives

- 1 Introduction
- 2 Concept
- 3 Discussion
- 4 Conclusion
- 5 Role Play

Session	General Objective (GO)	No	Specific Objective (SO)	Directions				
				Focus of delivery	Exercise		Level of Difficulty	Lecture's Remarks
					Section	No		
CALCULUS 2								
I	Understanding the fundamental ideas and concept of using digital signal processing	1	Review: complex number	Concept & Discussion	1.2	4	Easy	Exercise Type: Problem and computer-based exercise
		2	Introduction to DSP in general	Concept & Discussion	1.3	4	Easy	
		3	Use of DSP and applications	Concept & Discussion	1.4	2	Easy	
		4	General introduction to Signals and Systems	Concept & Discussion	1.4	4	Easy	
						1.4	6	Medium

Session	General Objective (GO)	No	Specific Objective (SO)	Directions				Lecture's Remarks
				Focus of delivery	Exercise		Level of Difficulty	
II	Understanding the various methods of representing signals	1	Signal plotting	Concept & Discussion	2.1	2	Easy	Exercise Type: Problem and computer-based exercise
		2	Signal functions	Concept & Discussion	2.2	3	Easy	
		3	Odd and even functions	Concept & Discussion	2.2	5	Medium	
		4	Operations on signals	Concept & Discussion	2.2	7	Medium	
				Concept & Discussion	2.3	3	Medium	

Session	General Objective (GO)	No	Specific Objective (SO)	Directions				Lecture's Remarks
				Focus of delivery	Exercise		Level of Difficulty	
III	Introducing the basic concept of discrete time signals	1	Review: continuous time signals	Concept & Discussion	3.3	2	Easy	Exercise Type: Problem
		2	Discrete time signals	Concept & Discussion	3.4	1	Easy	

Session	General Objective (GO)	No	Specific Objective (SO)	Directions				Lecture's Remarks
				Focus of delivery	Exercise		Level of Difficulty	
IV	Understanding various basic discrete time signals, their functions and usage	1	Impulse signals	Concept & Discussion	2.4	6	Easy	Exercise Type: Problem
		2	Unit Step	Concept & Discussion	2.5	3	Easy	
		3	Exponential signals	Concept & Discussion	2.5	4	Medium	
		4	Complex sinusoidal	Concept & Discussion	2.6	4	Easy	
		5	Discrete periodic signals	Concept & Discussion	2.9	2	Medium	

Session	General Objective (GO)	No	Specific Objective (SO)	Directions				Lecture's Remarks
				Focus of delivery	Exercise		Level of Difficulty	
V	Introducing the fundamental concept of system	1	Systems classifications	Concept & Discussion	6.1	1	Easy	Exercise Type: Problem
		2	Static v Dynamic	Concept & Discussion	6.2	2	Easy	
		3	Causal v Non-Causal		6.4	1	Easy	
		4	Linear v Non-Linear		6.4	3	Easy	
			Time Invariance v Time Varying		6.4	6	Medium	

Session	General Objective (GO)	No	Specific Objective (SO)	Directions				Lecture's Remarks
				Focus of delivery	Exercise		Level of Difficulty	
VI	Systems (continued)	1	Representing systems using block diagram	Concept & Discussion	6.3	1	Easy	Exercise Type: Problem
		2	Representing systems using graph	Concept & Discussion	6.3	7	Easy	
		3	LTI Systems	Concept & Discussion	6.3	9	Medium	

Session	General Objective (GO)	No	Specific Objective (SO)	Directions				Lecture's Remarks
				Focus of delivery	Exercise		Level of Difficulty	
VII	Understanding the concept of convolution in DSP, its computation, and its usage	1	Basic concept	Concept & Discussion	6.5	1	Easy	Exercise Type: Problem
		2	Array algorithm	Concept & Discussion	6.5	7	Easy	
		3	Polynomial multiplication method		6.5	8	Medium	
		4	Use of convolution in LTI system	Concept & Discussion	6.5	9	Medium	

MID SEMESTER TEST

Session	General Objective (GO)	No	Specific Objective (SO)	Directions				Lecture's Remarks
				Focus of delivery	Exercise		Level of Difficulty	
VIII	Introducing the basic concept of Fourier transform	1	Concept of frequency: complex frequency, negative frequencies	Concept & Discussion	4.1	2	Easy	Exercise Type: Problem
		2	Definition of Fourier transform (FT)	Concept & Discussion	4.1	3	Easy	
		3	Properties of FT	Concept & Discussion	4.2	2	Easy	
		4	Usage	Concept & Discussion	4.3	3	Medium	
					3.6	1	Easy	

Session	General Objective (GO)	No	Specific Objective (SO)	Directions				Lecture's Remarks
				Focus of delivery	Exercise		Level of Difficulty	
IX	Understanding the various methods of computing Fourier Transform	1	DFT	Concept & Discussion	4.6	3	Easy	Exercise Type: Problem
		2	DFT Properties	Concept & Discussion	4.7	1	Easy	
		3	FFT Algorithm	Concept & Discussion	4.7	5	Easy	
		4	FFT Types	Concept & Discussion	4.8	3	Easy	
					14.1	2	Easy	
					14.1	5	Medium	
					14.2	3	Medium	

Session	General Objective (GO)	No	Specific Objective (SO)	Directions				Lecture's Remarks
				Focus of delivery	Exercise		Level of Difficulty	
X	Introducing Z Transform	1	Basic concept of Z transform	Concept & Discussion	4.10	1	Easy	Exercise Type: Problem
		2	Properties of Z-transform	Concept & Discussion	4.10	3	Easy	
		3	Concept of frequency in Z-plane	Concept & Discussion	4.11	2	Medium	
					4.11	5	Easy	

Session	General Objective (GO)	No	Specific Objective (SO)	Directions				Lecture's Remarks
				Focus of delivery	Exercise		Level of Difficulty	
XI	Using Z-transform in systems analysis	1	Systems identification in Z Domain	Concept & Discussion	6.14	3	Easy	Exercise Type: Problem
		2	Pole and zero analysis of a systems	Concept & Discussion	6.14	5	Easy	
		3	Pole and zero plot	Concept & Discussion	7.6	5	Easy	
		4	Transfer function		7.6	7		
					7.6	9		

Session	General Objective (GO)	No	Specific Objective (SO)	Directions				Lecture's Remarks
				Focus of delivery	Exercise		Level of Difficulty	
XII	Understanding filters design, analysis, and its usage	1	MA filters	Concept & Discussion	6.7	1	Easy	Exercise Type: Problem
		2	ARMA filters	Concept & Discussion	6.7	5	Easy	
		3	Filter specification	Concept & Discussion	6.9	2	Easy	
		4	Design procedure	Concept & Discussion	6.9	3	Medium	
				Concept & Discussion	6.10	5		
				Concept & Discussion	7.1	3		

Session	General Objective (GO)	No	Specific Objective (SO)	Directions				Lecture's Remarks
				Focus of delivery	Exercise		Level of Difficulty	
XIII	Understanding the methods of identifying systems	1	Simple / easy case	Concept & Discussion	6.12	2	Easy	Exercise Type: Problem
		2	Hard case	Concept & Discussion	6.12	3	Easy	
		3	Using Z-domain	Concept & Discussion	6.13	4	Medium	
					6.14	5	Easy	

Session	General Objective (GO)	No	Specific Objective (SO)	Directions				Lecture's Remarks
				Focus of delivery	Exercise		Level of Difficulty	
XIV	Review to go over materials before final exam			Concept, discussion				

FINAL SEMESTER TEST