UNIVERSITAS BAKRIE

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

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

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. Ifeachor and Barrie W. Jervis, "Digital Signal Processing: A Practical Ap- proach", Prentice-Hall, 2002

Sanjit K. Mitra and James F. Kaiser, "Handbook for Digital Signal Processing", John Wiley & Sons, 1993

PA Lynn and W Fuerst, "Introductory Digital Signal Processing with Computer Applica- tions", Revised Edition, John Wiley & Sons, 1994

Supporting tools:
- Matlab or Octave – http://octave.gli.sourceforge.net
- Audacity – http://www.audacityteam.org
- Python – http://python.org

Session	General Objective (GO)	No	Specific Objective (SO)	Directions: Focus of delivery	Exercise: Section	Exercise: No	Level of Difficulty	Lecture's Remarks
C A L C U L U S 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	
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	
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	
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	
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	
		5	**Time Invariance v Time Varying**		6.4	6	Medium	
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	
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							
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	
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	
X	Introducting 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	
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		
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		
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	
XIV	Review to go over materials before final exam			Concept, discussion				

FINAL SEMESTER TEST

Jakarta, 1 April 2016

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