MODULE HANDBOOK
Master Program in Computer Science
Department of Computer Science and Electronics
Faculty of Mathematics and Natural Sciences
Universitas Gadjah Mada

Digital Signal Processing

Module name	**Digital Signal Processing**		
Module level	Master		
Code	MII 6896		
Courses (if applicable)	Digital Signal Processing (Pemrosesan Sinyal Digital)		
Semester	Even (Genap)		
Contact person	Dr. Agfianto Eko Putra, M.Si.		
Lecturer	Dr. Agfianto Eko Putra, M.Si.		
Language	Indonesia		
Relation to curriculum	Master program, elective, 2nd semester		
Type of teaching, contact hours	Master program : lectures, <17 student		
Workload	1. Lectures: 3×50 = 150 minutes (2.5 hours) per week 2. Exercises and Assignments: 3×60 = 180 minutes (3 hours) per week 3. Private study: 3×60 = 180 minutes (3 hours) per week		
Credit points	3 credit points (SKS)		
Requirements according to the examination regulations	A student must have attended at least 75% of the lectures to sit in the exams		
Recommended prerequisites	MII 6292 Electronics MII 6294 Instrumentations		
Learning outcomes and their corresponding PLOs	After completing this module, a student is expected to:		
	CO	**Description**	**Supported PLO**
	CO-1	Students are able to apply digital signal processing with geometric approach, including signal presentation, orthonormal bases and approximations.	
	CO-2	Students are able to demonstrate the basic concepts of digital signal processing using the geometric approach of the Hilbert space center, together with the necessary tools that underlie the construction of bases and frames.	

	CO-3	Students are able to compute and analyse the concept of signal processing in discrete-time or discrete-space, including spectral analysis using DTFT (Discret-Time Fourier Transform) and DFT (Discret Fourier Transform).			
	CO-4	Students are able to compute and analyse the concept of signal processing in continuous-time or continuous-space, including spectral analysis using FT (Fourier Transform) and Fourier Series.			
	CO-5	Students are able to compare the concept between discrete and continuous domains through sampling theorems and interpolation.			
	CO-6	Students are able to demonstrate the basic concepts in data compression related to the approximation theory, which is related to the selection of the coefficients of expansion that are maintained, and the compression theory, which is related to the approach of the coefficients.			
	CO-7	Students are able to explain the time-frequency properties of a signal in order to extract information, and are able to understand how much local information in time and frequency can be extracted using the uncertainty principles.			
Content	Digital Signal Processing plays an important role in the development of technology and computer systems and digital communications. Many advantages can be given by Digital Signal Processing compared to Analog Signal Processing. Therefore, it is appropriate for students in master program in Computer Science with interest in Computer Systems and Networks to be given with understanding and mastery in the field of Digital Signal Processing using a geometric approach, so that later they are ready to enter the world of work and research with rapidly developing technology today.				
Study and examination requirements and forms of examination	Mid-term examination Final examination Assignments				
Media employed	LCD, blackboard, websites, and books				
Assessments and Evaluation	**CO**	**Assessment Methods**	**Type**	**Percentage**	**Total**
	CO-1	Assignment 1	Formative	5%	12,5%

		Problem 1 of midterm exam	Summative	7,5%	
	CO-2	Assignment 2	Formative	5%	12,5%
		Problem 2 of midterm exam	Summative	7,5%	
	CO-3	Assignment 3	Formative	3%	10,5%
		Problem 3 of midterm exam	Summative	7,5%	
	CO-4	Assignment 4	Formative	3%	10,5%
		Problem 4 of midterm exam	Summative	7,5%	
	CO-5	Assignment 5	Formative	3%	18%
		Problem 1 of final exam	Summative	15%	
	CO-6	Assignment 6	Formative	3%	18%
		Problem 2 of final exam	Summative	15%	
	CO-7	Assignment 7	Formative	3%	18%
		Problem 3 of final exam	Summative	15%	
Reading List	• M. Vetterli, J. Kovacevic, and V. K. Goyal, 2014, “Foundation of Signal Processing”, Cambridge University Press.1 • M. Vetterli, J. Kovacevic, and V. K. Goyal, 2013, “Fourier and Wavelet Signal Processing”, Cambridge University Press.2 • Mallat, S., 2013, “A Wavelet Tour of Signal Processing 3rd Edition”, Academic Press				