

UNDERGRADUATE PROGRAM IN ELECTRONICS AND INSTRUMENTATION
DEPARTMENT OF COMPUTER SCIENCE AND ELECTRONICS
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
UNIVERSITAS GADJAH MADA

Module name	Digital Signal Processing I	
Module level	Undergraduate	
Code	MII-3605	
Courses (if applicable)	Digital Signal Processing I	
Semester	odd (Ganjil)	
Contact person	Dr. Agfianto Eko Putra, M.Si.	
Lecturer	Dr. Agfianto Eko Putra, M.Si. Catur Atmaji, S.Si., M.Cs.	
Language	Bahasa Indonesia	
Relation to curriculum	Undergraduate degree program, mandatory, 5 th semester	
Type of teaching, contact hours	Lectures, < 60 students, 3 hours	
Workload	<ol style="list-style-type: none"> 1. Lectures: 3 x 50 = 150 minutes (2 hour and 30 minutes) per week. 2. Exercises and Assignments: 3 x 50 = 150 minutes (2 hour and 30 minutes) per week. 3. Private study: 3 x 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 final exams.	
Mandatory prerequisites	MII-2816 Introduction to Control System	
Learning outcomes and their corresponding PLOs	<p>After completing this module, a student is expected to:</p> <p>CO-1 Understanding concepts of Digital Signal Processing and its Applications</p> <p>CO-2 Understanding concepts of discrete-time signal and system in time domain</p> <p>CO-3 Understanding concepts of sampling and reconstruction of analog signal and representation of discrete-time signal and system in frequency domain</p> <p>CO-4 Understanding and implementing the Z-Transform to solve the problem in difference equation</p> <p>CO-5 Understanding concepts of Fourier transform and its Applications (including the concept of Fast Fourier transform)</p> <p>CO-6 Understanding and able to describe the structure of digital filter, types of basic filter and realization of digital filter</p> <p>CO-7 Understanding concepts, able to design and implement FIR type filter</p>	<p>PLO2</p> <p>PLO2</p> <p>PLO2</p> <p>PLO3</p> <p>PLO3</p> <p>PLO4</p> <p>PLO4</p>

	CO-8 Understanding concepts, able to design and implement IIR type filter	PLO4
Content	The fundamental concepts of Digital Signal Processing, digital signal and system, Linear and Time-Invariance systems (LTI), difference equations, digital convolutions, sampling theorem in time and frequency domain, including signal reconstruction, Discrete Fourier Transform (DFT), Fast Fourier Transform (FFT), Z-Transform, concept and implementation of digital filter, Finite Impulse Response (FIR) filter, Infinite Impulse Response (IIR) filter.	
Study and examination requirements and forms of examination	<ul style="list-style-type: none"> • Quizzes (2) • Assignments (2) • Mid-term examination • Final examination 	
Media employed	LCD, whiteboard, websites (eLisa).	
Assessments and Evaluation	CO-1 Midterm exam, assignment (total: 10%) CO-2 Midterm exam, assignment (total: 10%) CO-3 Midterm exam, assignment (total: 15%) CO-4 Midterm exam, assignment (total: 15%) CO-5 Final exam, assignment (total: 10%) CO-6 Final exam, assignment (total: 10%) CO-7 Final exam, assignment (total: 15%) CO-8 Final exam, assignment (total: 15%)	
Reading List	<ol style="list-style-type: none"> 1. Ingle, V.K., and Proakis, J.G., 2012, Digital Signal Processing Using MATLAB, 3rd Edition, Cengage Learning, USA. 2. Dutoit, T., and Marques, F., 2009, Applied Signal Processing, New York: Springer Science. 	