Course Code	TKIE163224
Course Name	Digital Signal Processing Technique
Course Instructors	Litasari, Risanuri Hidayat, Sujoko Sumaryono
Course Type	Selected Elective
Course Classification	Engineering Topics
Credit / Contact Hour per Week	3 / 150 minutes per Week
Course Description	Digital signage processing applications are growing very rapidly in various fields. such as biomedical, sonar, radar, seismology, audio, video, speech, telecommunication and other fields. Understanding of the fundamentals and techniques of digital signaling is an essential requirement to know, understand and develop the applications. The Digital Sign Language Processing course covers basic concepts and techniques for the representation, transformation and manipulation of discrete gestures and timing systems, both in time and in transformation areas. Discrete Fourier time -formed (DTFT) transformations, discrete Fourier transforms (DFT), fast Fourier transforms (FFT) and Z transforms will be introduced as mathematical tools for the analysis and synthesis of discrete-time signals and systems. With the mathematical tool, will be explored the structure, specifications and techniques of FIR and IIR digital filter design.
Prerequisites Courses	
Covered Student Outcome	**Development of Engineering Solution (b)** **Engineering Design (c)** **Modern Tools Utilization (e)**

Learning Outcome

		Study Program Student Outcome
No	Learning Outcome	SO (a) – SO (k)
1.	1. Distinguish time-continuous cues, discrete time-cues and digital cues. 2. Describe the wide variety of Digital Signal Processing implementations. 3. Provide examples of various digital signaling processing applications	Development of Engineering Solution
2.	1. Describe the frequency spectrum of the signal cue for the various sampling rates. 2. Explain the occurrence of aliasing and prevention. 3. Explain the continuous time signaling reconstruction of the cue tersuplik.	Development of Engineering Solution
3.	1. Represents discrete time signal & system in Z region 2. Declare the system function H (z) and determine the area of convergence. 3. Using the convergence region H (z) for the analysis of LTI system characteristics. 4. Transform back from Z to the time zone.	Modern Tools Utilization
4.	1. Evaluate the magnitude and phase characteristics of LTI systems based on their frequency response 2. Explain the occurrence of gesture distortion in the LTI system 3. Explain the effect of pole and zeroes placement on frequency response. 4. Know the All-Pass filter & the Minimum Phase filter	Modern Tools Utilization
5.	1. Analysis of various digital filter structures 2. Understand the advantages and disadvantages of various structures 3. Change the structure to the equivalent structure.	Engineering Design
6.	1. Define and explain the specification of the digital	Engineering Design

	filter. 2. Explain the characteristics of various window types, their advantages and disadvantages. 3. Designing FIR filters based on filter specifications, using the method of travailing and other methods.	

Topic	1. Introduction 2. Discrete Time Gesture and Time System 3. Gesture and Discrete Time System in Frequency Area 4. Sampling Time-continuous cue 5. Transformation Z 6. LTI System in Transformation Area 7. Digital Filter Structure 8. FIR Filter Design Technique 9. IIR Screen Design Technique 10. Discrete Fourier Transform (DFT)
Direct Asessment	
Indirect Assesment	Questionnaire (EDOM)
References	[1] A. V. Oppenheim and R. W. Schafer, **Discrete Time Signal Processing, 3rd** edition, Prentice Hall, 2010 [3] J.G. Proakis & D.G. Manolakis, Dimitris G., **Applied Digital Signal Processing : theory and practice**, Cambridge University Press 2011 [4] Papirus.

Direct Asessment Plan	**Measured Learning Outcome**
Assignments	LO3,LO4
Mid Exam	LO1,LO2,LO3
Final Exam	LO4,LO5,LO6