



Module Description

Module name	Digital System
Module level, if applicable	Bachelor of Informatics
Code, if applicable	21D12110303
Subtitle, if applicable	-
Course, if applicable	-
Semester(s) in which the module is taught	1 st
Person responsible for the module	Dr. Eng. Muhammad Niswar., ST., MIT
Lecturer	1. Dr. Eng. Muhammad Niswar., ST., MIT 2. Dr. Amil Ahmad Ilham., ST., MIT 3. Iqra Aswad., ST., MT
Language	Indonesian Language [Bahasa Indonesia]
Relation to Curriculum	This course is a compulsory course and offered in the 1 st semester.
Type of teaching, contact hours	Teaching methods: [group discussion], [simulation], [case study], [collaborative learning], [project-based learning], [problem-based learning]. Teaching forms: [lecture], [tutoria], [seminar], [practicum], [research], [internship], [community service] CH : 08.00 - 16.00
Workload	For this course, students are required to meet a minimum of 181.33 hours in one semester, which consist of: - 53.33 hours for lecture, - 64 hours for structured assignments, - 64 hours for private study,



Credit points	3 credit points (equivalent with 5.1 ECTS)
Requirements according to the examination regulations	Students have participated in at least 80% of the learning activities (Academic Regulations, Chapter VII)
Recommended prerequisites	Basic Physics, Fundamental of Information Technology.
Module objectives/intended learning outcomes	<p>After completing the course, Students are able:</p> <p>Intended Learning Outcomes (ILO):</p> <p>ILO 1 : Have the knowledge of fundamental in Computing Science that includes basic theory and concepts of computer science, Mathematics and Statistics, Programming Algorithm, Software Engineering, Information Management and Digital Resilience, also the advance topics of either Artificial Intelligence, Data Science, Computer Network, Cloud Computing or Internet of Things</p> <p>ILO 4 : Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements by applying computer science theory and software development fundamentals.</p> <p>ILO 7 : Perform a logical systematic procedure to solve problems, then communicate their ideas in a convincing and effective manner, either in written or orally, to propose solutions.</p> <p>Course Learning Objective (CLO): Students understand the concept of designing and creating digital systems. Students are able to think logically and work independently in designing and creating digital circuits.</p> <p>Sub CLO :</p>



	<p>ILO 1 => CLO 1: Students can understand the concept of numbering system and conversion.</p> <p>ILO 1 => CLO 2: Students can understand the concept of logic gates.</p> <p>ILO 1 => CLO 3: Students can understand the theorem of boolean aljabar and simplification of boolean expression, thus converting boolean expression to digital logic circuit.</p> <p>ILO 4 => CLO 4: Students can understand the design and implementation of combinatorial circuit & sequential circuit.</p> <p>ILO 6 => CLO 5: Students can complete the design assignment, meet a given set of requirements and present the result to the lecturer and other students</p>
<p>Content</p>	<p>Students will learn about :</p> <ol style="list-style-type: none"> 1. Number system (binary, decimal, octa, hexadecimal) and number conversion 2. Logic Gates and Truth Tables. 3. Theorems of Boolean Algebra and Simplification of Boolean Expression 4. Simplification of Boolean expression using the Boolean theorem 5. Simplification of Boolean expression using the Karnaugh Map (K-Map) 6. Combinatorial Circuit Design 7. Combinatorial Circuits: Half/Full Adder, MUX, Decoder, Encoder, BCD 8. Sequential Circuit Design 9. Memory elements (flip-flops) and excitation tables. 10. Mealy & Moore Machine 11. Sequential Circuits: Counters and Shift Registers. 12. Design Assignment: (e.g. Vending Machine, Traffic Light)
<p>Forms of Assessment</p>	<p>Assessment techniques: [observation], [participation], [written test].</p> <p>Assessment forms: [final term exam], [assignment], [presentation].</p>



	<p>Final term exam = 40%, Assignment = 50%, Presentation = 10%</p> <p>CLO 1,2,3 => ILO 1: 40% (Final term exam: written test) CLO 4 => ILO 4: 50% (Assignment: participation) CLO 5 => ILO 7: 10% (Presentation: observation)</p>
Study and examination requirements and forms of examination	<p>Study and examination requirements:</p> <ul style="list-style-type: none"> - Students must attend 15 minutes before the class starts. - Students must switch off all electronic devices. - Students must inform the lecturer if they will not attend the class due to sickness, etc. - Students must submit all class assignments before the deadline. <p>Form of examination: Written exam: Essay</p>
Media employed	Video conference, Slide Presentation, Learning Management System (LMS).
Reading list	<p>Main :</p> <ol style="list-style-type: none"> 1. Digital Design with an Introduction to Verilog HDL, 5th Edition - M.Morris Mano, Michael D.Ciletti 2. Digital Systems: Principles and Applications - Ronald J. Tocci, Neal S. Widmer, Gregory L. Moss