



UNIVERSITAS GADJAH MADA

Faculty of Mathematics and Natural Sciences

Department of Computer Science and Electronics

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Bachelor in Computer Science

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MODULE HANDBOOK

Module name	Digital Systems														
Module level, if applicable	Undergraduate														
Code, if applicable	MII-1811														
Courses, if applicable	Digital Systems														
Semester(s) in which the module is taught	Spring (Even)														
Person responsible for the module															
Lecturer(s)															
Language	Bahasa Indonesia														
Relation to curriculum	1. Undergraduate degree program, compulsory, 2 nd semester. 2. International undergraduate program, compulsory, 2 nd semester.														
Teaching methods	1. Undergraduate degree program: lectures, < 60 students, 2. International undergraduate program: lectures, < 30 students.														
Workload (incl. contact hours, self-study hours)	1. Lectures: 2 x 50 = 100 minutes (1 hours 40 menit) per week. 2. Exercises and Assignments: 2 x 60 = 120 minutes (2 hours) per week. 3. Private study: 2 x 60 = 120 minutes (2 hours) per week.														
Credit points	2 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.														
Required and recommended prerequisites for joining the module	Logic for Computer Science														
Learning outcomes and their corresponding PLOs	<p>After completing this module, a student is expected to:</p> <p>CO1 be able to comprehend applied theories related to logic design Mampu menguasai teori-teori yang berkaitan dengan perancangan logika, perancangan sistem digital, dan perancangan kompute</p> <p>CO2 be able to apply logic and digital system design concepts, including Boolean algebra, Karnaugh maps, combinational function blocks, and sequential circuits, in designing a digital system</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th colspan="2">PLO</th> <th>CO1</th> <th>CO2</th> </tr> </thead> <tbody> <tr> <td rowspan="3">Program Learning</td> <td>PLO1</td> <td></td> <td></td> </tr> <tr> <td>PLO2</td> <td></td> <td></td> </tr> <tr> <td>PLO3</td> <td>√</td> <td></td> </tr> </tbody> </table>	PLO		CO1	CO2	Program Learning	PLO1			PLO2			PLO3	√	
PLO		CO1	CO2												
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	PLO2														
	PLO3	√													

	Outcome (PLO)	PLO4		√																							
		PLO5																									
Content	<p>(a) Combinational logic (design procedure, adders, subtractors, code conversion, analysis procedure, multilevel NAND circuits, multilevel NOR circuits, exclusive OR functions)</p> <p>(b) MSI and PLD components (binary adder and subtractor, magnitude comparator, decoders and encoders, multiplexers, ROM, programmable logic array, programmable array logic)</p> <p>(c) Synchronous sequential logic & finite state diagrams (flip-flops, triggering flip-flops, analysis of clocked sequential circuits, state reduction and assignment, flip-flop excitation tables, design procedure, design of counters)</p> <p>(d) Registers, counters, and the memory units (registers, shift registers, ripple counters, synchronous counters, timing sequences, RAM, memory decoding, error correcting codes)</p> <p>(e) Register transfer and microoperations (register transfer language, register transfer, bus and memory transfer, arithmetic microoperations, logic microoperations, shift microoperations, arithmetic logic shift unit)</p> <p>(f) Basic computer design (instruction codes, computer registers, computer instructions, timing and control, instruction cycle, memory reference instructions, input-output and interrupt, complete computer description, design of basic computer, design of accumulator logic)</p> <p>(g) Microprogrammed control (control memory, address sequencing, microprogram example, design of control unit)</p>																										
Study and examination requirements and examination forms	<p>The evaluation is done in 3 forms, namely:</p> <ol style="list-style-type: none"> 1. Examination, either midterm or final exam, 2. Three tasks, in the form of individual assignments to be completed within a certain timeframe, and 3. Three quizzes, held on LMS (eLOK), twice before midterm exam and once after midterm exam, with a short answer or multiple choice form. <p>Assessment is done using benchmark assessment, to measure the level of student's comprehension and competency related to the target and class rank.</p>																										
Media employed	LCD, blackboard, and websites, learning management systems (eLOK)																										
Assessments and evaluation	<table border="1"> <thead> <tr> <th>Type</th> <th>Percentage</th> <th>CO1</th> <th>CO2</th> </tr> </thead> <tbody> <tr> <td>Quiz</td> <td>15%</td> <td>√</td> <td></td> </tr> <tr> <td>Individual Task</td> <td>15%</td> <td>√</td> <td>√</td> </tr> <tr> <td>Midterm Exam</td> <td>35%</td> <td>√</td> <td>√</td> </tr> <tr> <td>Final Exam</td> <td>35%</td> <td>√</td> <td>√</td> </tr> <tr> <td>Total</td> <td>100%</td> <td></td> <td></td> </tr> </tbody> </table>	Type	Percentage	CO1	CO2	Quiz	15%	√		Individual Task	15%	√	√	Midterm Exam	35%	√	√	Final Exam	35%	√	√	Total	100%				
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Reading list	<ol style="list-style-type: none"> 1. M. Morris Mano, 1979, Digital Logic and Computer Design, Prentice Hall. 2. M. Morris Mano and Michael D. Ciletti, 2013, Digital Design: With an Introduction to the Verilog HDL, 5th Edition, Pearson Education, Inc. 																										

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