

FI441 Digital Electronics

Module name:	Digital Electronics	
Module level, if applicable:	Undergraduate	
Code:	FI441	
Sub-heading, if applicable:	-	
Classes, if applicable:	-	
Semester:	4 th	
Module coordinator:	Ahmad Aminudin	
Lecturer(s):	Ahmad Aminudin	
Language:	Bahasa Indonesia	
Classification within the curriculum	Compulsory course	
Type of Teaching	Contact hours per week during the semester	Class Size
1. Lecture (conceptual, contextual and problem-solving approaches through expository, discussions and practical methods). 2. Structured activities (assignments based on conceptual, contextual and problem-solving approaches) 3. Self-study (reading literature and experiment project electronic circuit)	2 hours 30 minutes	35
Workload:	The total workload is 136 hours/8160 minutes (4.8 ECTS) per semester, consisting of 35 hours/2100 minutes lectures (1.24 ECTS), 42 hours/2520 minutes structured activities (1.48 ECTS) and 42 hours/2520 minutes self-study (1.71 ECTS) per week for 14 weeks, 17 hours/1020 minutes for two exams (0.6 ECTS).	
Credit points:	4.8 ECTS	
Pre-requisites course(s):	FI241 Analog Electronics	

<p>Course Learning Outcomes (CLO):</p>	<p>After taking this course the students have ability to:</p> <p>CLO1. Describe Number System: Analog versus Digital, Binary Numbers, Octal, Decimal and Hexadecimal.</p> <p>CLO2. Describe the principles and application of Logic NOT, AND, OR, NAND, N OR, XOR and XNOR gates</p> <p>CLO3. Describe the concept of Logic Transistors and CMOS Logic technology</p> <p>CLO4. Describe the principles of a boolean algebra, K-Map for circuit simplification techniques</p> <p>CLO5. Describe the principles of Arithmetic Circuits</p> <p>CLO6. Apply Arithmetic Circuits</p> <p>CLO7. Describe workings of Multiplexer, Demultiplexer, Encoder and Decoder circuits</p> <p>CLO8. Apply a series of Multiplexers, Demultiplexers, Encoders and Decoders</p> <p>CLO9. Describe the concept of Programmable Logic Device</p> <p>CLO10. Describe the concept of Multivibrator, Flip-Flop</p> <p>CLO11. Describe the concept of counter and Register</p> <p>CLO12. Implement a series of Counter and Register</p> <p>CLO13. Implement the Data Conversion Series: DA C, ADC and their specifications</p> <p>CLO14. Implement Display: seven segment, Dot matrix LED, LCD</p>																																						
<p>Content:</p>	<p>In this course, students will study Number Systems: Analog versus Digital, Binary Numbers, Octal, Decimal and Hexadecimal .; Logic NOT, AND, OR gates; NAND, N OR, XOR, XNOR, Logic Gates; Logic transistors, CMOS Logic; Boolean algebra, K-Map, circuit simplification technique; Arithmetic Circuit: Combined logic circuit, Half Adder, Full Adder; Multiplexer, Demultiplexer, Encoder and Decoder; Programmable Logic Device: Programmable ROM, Programmable Logic Array, Programmable Array Logic; Multivibrator: Bistable, Monostable and Astable; Flip-Flop: RS-FF, JK FF, D-FF; Counter: Synchronous Counter, Modulus Counter, Decoding counter, Practicum; Register: Shift Register, Shift register counter; Data Conversion Series: DA C, ADC and their specifications; Display: even segment, Dot matrix, LED, LCD.</p>																																						
<p>Study/exam achievements:</p>	<p>The final mark will be weight as follow:</p> <table border="1" data-bbox="667 1518 1495 2011"> <thead> <tr> <th>No</th> <th>CLO</th> <th>Assessment Object</th> <th>Assessment Techniques</th> <th>Weight</th> </tr> </thead> <tbody> <tr> <td rowspan="3">1</td> <td rowspan="3">CLO1 - CLO14</td> <td>Subject specific competences:</td> <td rowspan="3">Written</td> <td rowspan="3">20 %</td> </tr> <tr> <td>a. Individual assignments</td> </tr> <tr> <td>b. Exam</td> </tr> <tr> <td></td> <td></td> <td>- Mid exam</td> <td>Written Test</td> <td>25%</td> </tr> <tr> <td></td> <td></td> <td>- Final exam</td> <td>Written Test</td> <td>25%</td> </tr> <tr> <td rowspan="3">2</td> <td rowspan="3">CLO6, CLO8, CLO12, CLO13, CLO14</td> <td>Subject specific competences:</td> <td rowspan="3">Performance</td> <td rowspan="3">10%</td> </tr> <tr> <td>- Class Activity</td> <td>Performance</td> <td>20%</td> </tr> <tr> <td>- Experiment</td> <td></td> <td></td> </tr> <tr> <td colspan="4">Total</td> <td>100%</td> </tr> </tbody> </table>	No	CLO	Assessment Object	Assessment Techniques	Weight	1	CLO1 - CLO14	Subject specific competences:	Written	20 %	a. Individual assignments	b. Exam			- Mid exam	Written Test	25%			- Final exam	Written Test	25%	2	CLO6, CLO8, CLO12, CLO13, CLO14	Subject specific competences:	Performance	10%	- Class Activity	Performance	20%	- Experiment			Total				100%
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