



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	Logic for Computer Science
Module level	Undergraduate
Code	MII-1002
Courses (if applicable)	
Semester	Fall (Odd)
Contact person	Drs. Sri Mulyana, M. Kom.
Lecturer	1. Drs. Retantyo Wardoyo, M. Sc.. Ph. D. 2. Drs. Sri Mulyana, M. Kom.
Language	Bahasa Indonesia & English
Relation to curriculum	1. Undergraduate degree program, compulsory, 6th semester. 2. International undergraduate program, compulsory, 6th semester.
Type of teaching, contact hours	1. Undergraduate degree program: lectures, < 60 students, 2. International undergraduate program: lectures, < 30 students.
Workload	1. Lectures: 2 x 50 = 150 minutes per week. 2. Exercises and Assignments: 1 x 50 = 100 minutes per week. 3. Private study: 1 x 50 = 50 minutes 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.
Recommended prerequisites	--
Learning outcomes (course outcomes) and their corresponding PLOs	After completing this module, a student is expected to: CO1. master the fundamental concepts of logics required to follow the course(s), such as algorithms and programming. CO2. capable to recognize and construct abstract sentences in propositional logic language and determine the truth value based on certain interpretations and prove the validity of sentences in propositional logic. CO3. mastering the concept of substitution in propositional logic both total and partial, and able to determine the results of the two types of substitution. CO4. capable to recognize and construct sentences in predicate logic language including quantifiable ones, determine independent or dependent variables and sentence truth values based on certain interpretations

	<p>CO5. capable to prove the validity of closed sentences in predicate .logic either by direct proof technique or proof using falsification technique, as well as solving the substitution problem in predicate logic.</p> <p>CO6. master the concepts of Boolean algebra, Boolean functions, Boolean Identities, standard and canonical forms, logic gates and Karnaugh Maps.</p> <p>CO7. capable to simplify Boolean functions using Boolean identities, Karnaugh Maps and tabulations</p> <table border="1" data-bbox="440 478 1325 699"> <thead> <tr> <th colspan="2">PLO</th> <th>CO1</th> <th>CO2</th> <th>CO3</th> <th>CO4</th> <th>CO5</th> <th>CO6</th> <th>CO7</th> </tr> </thead> <tbody> <tr> <td>Program Learning Outcome (PLO)</td> <td>PLO1</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>PLO2</td> <td>√</td> <td>√</td> <td>√</td> <td>√</td> <td>√</td> <td>√</td> <td>√</td> </tr> <tr> <td></td> <td>PLO3</td> <td></td> <td>√</td> <td></td> <td>√</td> <td>√</td> <td>√</td> <td>√</td> </tr> <tr> <td></td> <td>PLO4</td> <td></td> <td>√</td> <td></td> <td>√</td> <td>√</td> <td>√</td> <td>√</td> </tr> <tr> <td></td> <td>PLO5</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	PLO		CO1	CO2	CO3	CO4	CO5	CO6	CO7	Program Learning Outcome (PLO)	PLO1									PLO2	√	√	√	√	√	√	√		PLO3		√		√	√	√	√		PLO4		√		√	√	√	√		PLO5							
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<p>Contents</p>	<ol style="list-style-type: none"> Propositional Logic: Declarative Sentence, Natural Deduction: Rules of Natural Deduction, Derivative Rules and Demonstrable Equivalents, Propositional Logic as Formal Language, Semantics of Propositional Logic: Logic-Connective Meaning, Propositional Logic Soundness and Completeness Propositional Logic. Predicate Logic: Need for a Richer Language, Predicate Logic as a Formal Language: Terms, Formulas, Independent and Bound Variables, and Substitution; The Theory of Proving from Predicate Logic: Rules of Natural Deduction and Quantifying Equivalents; Semantics of Predicate Logic: Model, Entailment Semantics and Equality Semantics. Boolean Algebra: Axioms, Basic Theorems, Properties of Boolean Algebra Boolean Functions, Standard and Canonical Forms, Logic Gates. Simplification of Boolean Functions: Simplification using Boolean Identity, Karnaugh Maps, Simplification using Karnaugh Maps, Don't Care Conditions, Simplification by Tabulation Method, Calculation and Selection of Prime Implicant 																																																						
<p>Study and examination requirements and forms of examination</p>	<p>The evaluation is done in 2 forms, namely:</p> <ol style="list-style-type: none"> Trial, either midterm or semester test, Six tasks, including individual, <p>Assessment is done using benchmark assessment, with the aim of measuring the level of student understanding related to the target and class rank.</p>																																																						
<p>Media employed</p>	<p>e-learning Platform (eLOK), LCD, whiteboard, and websites.</p>																																																						

Assessments and Evaluation	<table border="1"> <thead> <tr> <th>Type</th> <th>Percentage</th> <th>CO1</th> <th>CO2</th> <th>CO3</th> <th>CO4</th> <th>CO5</th> <th>CO6</th> <th>CO7</th> </tr> </thead> <tbody> <tr> <td>Task 1</td> <td>5</td> <td></td> <td>√</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Task 2</td> <td>5</td> <td></td> <td></td> <td>√</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Task 3</td> <td>5</td> <td></td> <td></td> <td></td> <td>√</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Mid Test</td> <td>30</td> <td>√</td> <td>√</td> <td>√</td> <td>√</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Task 4</td> <td>5</td> <td></td> <td></td> <td></td> <td></td> <td>√</td> <td></td> <td></td> </tr> <tr> <td>Task 5</td> <td>5</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>√</td> <td></td> </tr> <tr> <td>Task 6</td> <td>5</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>√</td> </tr> <tr> <td>Final test</td> <td>30</td> <td></td> <td></td> <td></td> <td></td> <td>√</td> <td>√</td> <td>√</td> </tr> <tr> <td>Total</td> <td>100</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Type	Percentage	CO1	CO2	CO3	CO4	CO5	CO6	CO7	Task 1	5		√						Task 2	5			√					Task 3	5				√				Mid Test	30	√	√	√	√				Task 4	5					√			Task 5	5						√		Task 6	5							√	Final test	30					√	√	√	Total	100							
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