



UNIVERSITAS GADJAH MADA

Faculty of Mathematics and Natural Sciences

Department of Computer Science and Electronics

Sekip Utara Bulaksumur Yogyakarta 55281 Telp: +62 274 546194 Email: dep-ike.mipa@ugm.ac.id Website: <http://dcse.fmipa.ugm.ac.id>

Bachelor in Computer Science

Telp : +62 274 546194

Email : prodi-s1-ilkom.mipa@ugm.ac.id

Website : <http://dcse.ugm.ac.id/>

MODULE HANDBOOK

Module name	Fuzzy Logic
Module level	Undergraduate
Code	MII-212404
Courses (if applicable)	
Semester	Fall (even)
Contact person	Drs. Retantyo Wardoyo, M. Sc., Ph. D.
Lecturer	1. Drs. Retantyo Wardoyo, M. Sc., Ph. D. 2. Dr. Sri Mulyana, M. Kom. 3. Aina Musdholifah, S. Kom., M. Kom., Ph.D.
Language	Bahasa Indonesia & English
Relation to curriculum	1. Undergraduate degree program, elective, 3,5,7th semester. 2. International undergraduate program, elective, 3,5,7th 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 60 = 120 minutes per week. 2. Exercises and Assignments: as scheduled 3. Private study: 1 x 30 = 30 minutes per week.
Credit points	3 credit points (sks).
Requirements according to the Examination regulations	-
Recommended prerequisites	Informatics Logics

<p>Learning outcomes (course outcomes) and their corresponding PLOs</p>	<p>After completing this module, a student is expected to:</p> <p>CO1. Students can arrange the functions and membership of the association; fuzzy set, fuzzy set properties; operator on fuzzy set: complement, s-norm, t-norm</p> <p>CO2. Students can explain and apply fuzzy relations and composition of fuzzy relations, special properties of fuzzy relations</p> <p>CO3. Students can explain and apply linguistic, fuzzy propositions; fuzzy logic operator; fuzzy implications (fuzzy rule), generalized modus ponens; generalized tollens mode; generalized hypothetical syllogism</p> <p>CO4. Students can explain and apply the fuzzy rules system; fuzzification and defuzzification</p> <p>CO5. Students are able to form fuzzy rules from existing knowledge or information in everyday life to solve real problems</p> <p>CO6. Students are able to conduct research to develop fuzzy systems as a solution to real problems and explain the results of their research</p> <table border="1" data-bbox="467 806 1395 1026"> <thead> <tr> <th></th> <th>PLO</th> <th>CO1</th> <th>CO2</th> <th>CO3</th> <th>CO4</th> <th>CO5</th> <th>CO6</th> </tr> </thead> <tbody> <tr> <td rowspan="5">Program Learning Outcome (PLO)</td> <td>PLO1</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>PLO2</td> <td>√</td> <td>√</td> <td>√</td> <td></td> <td></td> <td></td> </tr> <tr> <td>PLO3</td> <td>√</td> <td>√</td> <td>√</td> <td>√</td> <td>√</td> <td>√</td> </tr> <tr> <td>PLO4</td> <td></td> <td></td> <td></td> <td>√</td> <td>√</td> <td>√</td> </tr> <tr> <td>PLO5</td> <td></td> <td></td> <td></td> <td></td> <td>√</td> <td>√</td> </tr> </tbody> </table>		PLO	CO1	CO2	CO3	CO4	CO5	CO6	Program Learning Outcome (PLO)	PLO1							PLO2	√	√	√				PLO3	√	√	√	√	√	√	PLO4				√	√	√	PLO5					√	√
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<p>Contents</p>	<ol style="list-style-type: none"> 1. Introduction (Fuzzy vs Crisp) 2. Fuzzy Set; Characteristic of Fuzzy Set; Operator on Fuzzy Set 3. Complement, s-norm, t-norm. 4. Fuzzy Relation dan Composition of Fuzzy Relation; Specific characteristic of fuzzy relation. 5. Linguistic; fuzzy Proposition. 6. Operator of fuzzy logic 7. Fuzzy Implication (fuzzy rule). 8. Generalised modus ponens; Generalised modus tollens; Generalised hypothetical syllogism. 9. Fuzzy Inference System (Fuzzification dan Defuzzification) 10. Development of Fuzzy Inference System 																																												
<p>Study and examination requirements and forms of examination</p>	<p>The evaluation is done in 3 forms, namely:</p> <ol style="list-style-type: none"> 1. Trial, either midterm or semester test, 2. Three tasks, including individual, 3. One group assignment to be completed within a certain timeframe, <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> </tr> </thead> <tbody> <tr> <td>Individual Task 1</td> <td>20</td> <td>√</td> <td>√</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Midterm Exam</td> <td>30</td> <td>√</td> <td>√</td> <td>√</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Individual Task 2</td> <td>10</td> <td></td> <td></td> <td>√</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Group Task</td> <td>15</td> <td></td> <td></td> <td></td> <td></td> <td>√</td> <td>√</td> </tr> <tr> <td>Final Exam</td> <td>25</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> </tr> </tbody> </table>								Type	Percentage	CO1	CO2	CO3	CO4	CO5	CO6	Individual Task 1	20	√	√					Midterm Exam	30	√	√	√				Individual Task 2	10			√				Group Task	15					√	√	Final Exam	25				√			Total	100						
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Reading List	W1. Wang, Li-Xin, 1997, "A Course in Fuzzy Systems and Controls" W2. George J. Klir dkk, 1997, "Fuzzy Set Theory: Foundations and Applications." A1. H.-J. Zimmermann, 2001, "Fuzzy set theory and its applications."																																																															

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