



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	Big Data Analytics																																				
Module level	Undergraduate																																				
Code	MII-3507																																				
Courses (if applicable)	NA																																				
Semester	Fall (Odd)																																				
Contact person	Moh Edi Wibowo, Ph.D.																																				
Lecturer	Moh Edi Wibowo, Ph.D.																																				
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: 3 x 50 = 150 minutes per week. 2. Exercises and Assignments: 2 x 50 = 100 minutes per week. 3. Private study: 1 x 50 = 50 minutes per week.																																				
Credit points	3 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	Databases																																				
Learning outcomes (course outcomes) and their corresponding PLOs	<p>After completing this module, a student is expected to:</p> <p>CO1. Able to understand the overview of big data analytics technologies and pipelines</p> <p>CO2. Able to understand the concepts and technologies of distributed file systems</p> <p>CO3. Able to understand data ingestion and buffering techniques on message brokers</p> <p>CO4. Able to understand the concept of the map-reduce computational framework</p> <p>CO5. Able to understand data analysis and machine learning on a map-reduce framework</p> <p>CO6. Able to understand visualization in big data</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <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> </tr> </thead> <tbody> <tr> <td rowspan="3">Program Learning</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> </tbody> </table>							PLO		CO1	CO2	CO3	CO4	CO5	CO6	Program Learning	PLO1							PLO2	√	√		√			PLO3			√			√
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Contents	<ol style="list-style-type: none"> 1. Distributed file systems; 2. Data ingestion and message broker; 3. Map-reduce computational framework; 4. Big data analytics using map-reduce framework; 5. Big data visualization 																																																																
Study and examination requirements and forms of examination	<p>The evaluation is done in 2 forms, namely:</p> <ol style="list-style-type: none"> 1. Trial, either midterm or semester test, 2. Two tasks, including individual, 3. Two group assignments to be completed within a certain timeframe, and <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>																																																																
Media employed	e-learning Platform (ELOK), LCD, blackboard, and websites.																																																																
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>Quiz</td> <td>5</td> <td>√</td> <td></td> <td>√</td> <td>√</td> <td>√</td> <td></td> </tr> <tr> <td>Individual Task</td> <td>10</td> <td>√</td> <td>√</td> <td>√</td> <td>√</td> <td>√</td> <td>√</td> </tr> <tr> <td>Group task 1</td> <td>15</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Midterm test</td> <td>25</td> <td>√</td> <td></td> <td>√</td> <td>√</td> <td></td> <td></td> </tr> <tr> <td>Group Task 2</td> <td>15</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Final term test</td> <td>30</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	Quiz	5	√		√	√	√		Individual Task	10	√	√	√	√	√	√	Group task 1	15							Midterm test	25	√		√	√			Group Task 2	15							Final term test	30					√	√	Total	100						
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Reading List	<ul style="list-style-type: none"> • Chuck P. Lam, Mark W. Davis, dan Ajit Gaddam, 2010, Hadoop in Action, Manning Publications. • Holden Karau, Andy Konwinski, Patrick Wendell, & Matei Zaharia, 2015, Learning Spark: Lightning-Fast Big Data Analysis, O'Reilly Media, Inc. • Neha Narkhede, Gwen Shapira, & Todd Palino, 2016, Kafka the Definitive Guide: Real-Time Data and Stream Processing at Scale, O'Reilly Media, Inc. 																																																																

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