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	**Special Topic on Algorithm and Computation**
Module level	Undergraduate
Code	MII21-2504
Courses (if applicable)	Special Topic on Algorithm and Computation
Semester	Winter (Genap)
Contact person	Prof. Retantyo Wardoyo, PhD
Lecturer	Practitioner /experties Prof. Retantyo Wardoyo, PhD Anny Kartika Sari, S.Si., M.Sc., Ph.D Faizal Makhrus,S.Kom., M.Sc., Ph.D Janoe Hendarto, Drs., M.I.Kom. Muhammad Alfian Amrizal, B.Eng., M.I.S., Ph.D. Nur Rokhman, S.Si., M.Kom., Dr. Prof. Dr.-Ing. Mhd. Reza M. I. Pulungan, S.Si., M.Sc. Suprapto, Drs., M.I.Kom. Dr. Wahyono, S.Kom, Ph.D.
Language	Bahasa Indonesia English
Relation to curriculum	Undergraduate degree program, elective, 5th, 6th semester.
Type of teaching, contact hours	Undergraduate degree program: lectures
Workload	1. Lectures: 3 x 50 = 100 minutes (2.5 hours) per week. 2. Exercises and Assignments: 3 x 60 = 180 minutes (2 hours) per week. 3. Private study: 3 x 60 = 180 minutes (3 hours) 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	Have taken minimal 60 credits
Learning outcomes and their corresponding PLOs	After completing this module, a student is expected to: CO1 Students are able to understand and explain the latest algorithms which are used in real applications developments. CO2 Students are able to explain the application of algorithms in real applications. CO3 Students are able to solve a simple problem using the algorithmic and computational approaches. CO4 Students are able to represent and explain the results of their works.

PLO		CO1	CO2	CO3	CO4
Program Learning Outcome (PLO)	PLO1				v
	PLO2	V			
	PLO3		v		
	PLO4			v	
	PLO5				v

<table>
<tr><td>Content</td><td>The topics in algorithm and computational are based on the research interest of the lab member or the invited practitioners as guest lecturers. Some conducted topics were distributed system in Google, operationresearch in Blibli.com, game development in Creacle, practical uses of high-performance computer, etc.

The given topics in this course are based on the research or current technologies which are mastered by the lab member or the invited practitioner. In each semester, the topics can be different from the previous semester. However, in general, the topics are about the usage of algorithms in real applications.

Some the latest topics in the field of Algorithms and computing, such as Automatic Computing, AR-VR-Metaverse, Functional programming applications, active computing applications, parallel computing applications, Unity language applications for games, music and songs, GUI development applications with Thinter, automatic decision, and others. Students can choose from topics or cases that will be studied in a reference list, or other theme.</td></tr>
<tr><td>Study and examination requirements and forms of examination</td><td>Assignments, midterms examination, and final examination.</td></tr>
<tr><td>Media employed</td><td>LCD, blackboard, websites, and programming tools</td></tr>
<tr><td>Assessments and Evaluation</td><td>
<table>
<tr><th>Type</th><th>Percentage</th><th>CO1</th><th>CO2</th><th>CO3</th><th>CO4</th></tr>
<tr><td>Individual task & Quiz</td><td>10</td><td>v</td><td>v</td><td></td><td></td></tr>
<tr><td>Project/task topic 1, 2</td><td>20</td><td>v</td><td>v</td><td></td><td></td></tr>
<tr><td>Project/task topic 3, 4</td><td>20</td><td>v</td><td>v</td><td></td><td></td></tr>
<tr><td>Project/task topic 5, 6</td><td>20</td><td>v</td><td>v</td><td></td><td></td></tr>
<tr><td>Final Project</td><td>20</td><td></td><td></td><td>v</td><td>v</td></tr>
<tr><td>Midterm Exam</td><td>10</td><td>v</td><td></td><td></td><td></td></tr>
<tr><td>Final Exam</td><td>10</td><td></td><td>v</td><td></td><td></td></tr>
<tr><td>Total</td><td>100</td><td>30</td><td>40</td><td>10</td><td>10</td></tr>
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<tr><td>Reading List</td><td>

Naono, Ken Naono (Editor), Keita Teranishi (Editor), John Cavazos (Editor), Reiji Suda (Editor) , 2010, Software Automatic Tuning: From Concepts to State-of-the-Art Results, Springer, I SBN-13: 978-1441969347
Timothy Jung and M. Claudia tom Dieck, 2023, XR-Metaverse Cases: Business Application of AR, VR, XR and Metaverse (Business Guides on the Go), Springer, ISBN-13978-3031305658
M. Claudia tom Dieck and Timothy Jung (Editor), 2019, Augmented Reality and Virtual Reality The Power of AR and VR for Business, Springer, ISBN 978-3-030-06245-3, eISBN 978-3-030-06246-0
Paris Buttfield-Addison, Jon Manning , Tim Nugent, 2019, Unity Game Development Cookbook: Essentials for Every Game (1st ed), O'Reilly Media, SBN-13978-1491999158
Alan D. Moore , 2021, Python GUI Programming with Tkinter: Design and build functional and user-friendly GUI applications (2nd Ed), Packt Publishing, SBN-13978-1801815925
Vicente García-Díaz (Editor), 2021, Algorithms in Decision Support Systems, Mdpi AG, ISBN-13978-3036505886
Meinhard Müller, 2015, Fundamentals of Music Processing: Audio, Analysis, Algorithms, Applications (1st ed), Springer-Verlag New York Inc.

Noted: References are based on the given topics
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