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 Electronics and Instrumentation
Telp   : +62 274 546194
Email   : kaprodi-s1-elins.mipa@ugm.ac.id
Website : http://dcse.ugm.ac.id/

MODULE HANDBOOK

Module name	**Practicum of Algorithm and Data Structure**
Module level	Undergraduate
Code	MII211204
Courses (if applicable)	Algorithm and Data Structure
Semester	Even (Genap)
Contact person	Aufaclav Zatu Kusuma Frisky, M. Sc
Lecturer	1. Aufaclav Zatu Kusuma Frisky, M. Sc
Language	Bahasa Indonesia/English
Relation to curriculum	1. Undergraduate degree program, elective, 5th semester. 2. International undergraduate program, elective, 5th semester.
Type of teaching, contact hours	1. Undergraduate degree program: lectures, < 60 students, 2. International undergraduate program: lectures, < 30 students.
Workload	1. Practicums: 11 x 50 = 600 minutes 2. Case Study: 1 x 50 = 50 minutes. 3. Final Exam: 1 x 50 = 50 minutes.
Credit points	1 credit point (sks).
Requirements according to the Examination regulations	A student must have attended at least 70% of the lectures to sit in the exams.
Recommended prerequisites	Computer programming skill
Learning outcomes (course outcomes) and their corresponding PLOs	After completing this module, a student is expected to: CO1 Students are able to write programs using object-oriented programming methods and implement linear string, linked list, stack, and queue data structures. CO2 Students are able to make programs with non-linear tree data structures and their variants and apply algorithms to trees. CO3 Students are able to make programs with non-linear graph data structures and apply algorithms to graphs. CO4 Students are able to make programs with advanced concepts of disjoint sets, string matching, and convex hull.

PLO		CO1	CO2	CO3	CO4
Program Learning Outcome (PLO)	PLO2	√	√		
	PLO3	√	√	√	√
	PLO4	√	√	√	√
	PLO5				√

Contents	1. Pengenalan Java dan Pemrograman Berorientasi Objek 2. Struktur Data Array dan Linked List 3. Struktur Data Tree and Binary Tree 4. Balanced Tree: AVL Tree 5. Sorted Tree: Heap Tree 6. Pengantar Graf: Representasi Graf dan Penelusuran Graf (Depth First Search, Breath First Search) 7. Shortest Path 8. Minimum Spanning Tree 9. Disjoint Set 10. String Matching 11. Convex Hul
Study and examination requirements and forms of examination	The evaluation is planned in 3 forms, namely: 1. Practicum, either midterm or end of term test, 2. Individual assignments to be completed within a certain timeframe, and 3. Final examination Assessment is done using benchmark assessment, with the aim of measuring the level of student understanding related to the target and class rank.
Media employed	LCD, blackboard, and websites.
Assessments and Evaluation	

Type	Percentage	CO2	CO3
Practicum	45 %	√	√
Report	30 %	√	
Case Study	10 %		√
Final Exam	15 %		√
Total	100%		

Reading List	1. Dasgupta, Sanjoy, Christos Papadimitriou, and Umesh Vazirani. Algorithms. McGraw-Hill, 2006. ISBN: 9780073523408. 2. Kleinberg, Jon, and Eva Tardos. Algorithm Design. Addison-

	Wesley, 2005. ISBN: 9780321295354.
	3. Thomas H. Cormen, Charles E. Leiserson, et.al., Introduction to Algorithms, third edition, 2014.
	4. Brian W. Kernighan, Dennis M., The C Programming Language 2nd Edition, 1988. Ritchie, ISBN-13: -0131103627.