UNDERGRADUATE PROGRAM IN COMPUTER SCIENCE
DEPARTMENT OF COMPUTER SCIENCE AND ELECTRONICS
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
UNIVERSITAS GADJAH MADA

Module name	**Analysis of Algorithms and Complexity**	
Module level	Undergraduate	
Code	MII-2201	
Courses (if applicable)	Analysis of Algorithms and Complexity	
Semester	Fall (Gasal)	
Contact person	Anny Kartika Sari, M.Sc., Ph.D.	
Lecturer	Anny Kartika Sari, M.Sc., Ph.D. Faizal Makhrus, M.Sc., Ph.D.	
Language	Bahasa Indonesia and English	
Relation to curriculum	Undergraduate degree program, mandatory, 3rd semester.	
Type of teaching, contact hours	Lectures, < 60 students, regular: Tuesdays, 10.30-13.00, international: Wednesdays, 10.30-13.00.	
Workload	1. Lectures: 3 x 50 = 150 minutes (2.5 hours) per week. 2. Exercises and Assignments: 3 x 60 = 180 minutes (3 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.	
Mandatory prerequisites	Discrete Mathematics.	
Learning outcomes and their corresponding PLOs	After completing this module, a student is expected to: CO-1: understand and are able to explain the basic concepts of analysis of algorithms and calculate running time of algorithms. CO-2: understand and are able to explain several types of asymptotic notations and how to determine them based on running time. CO-3: understand and are able to apply the methods to solve recurrences. CO-4: understand and are able to choose existing efficient algorithms. CO-5: understand and are able to use a few analysis techniques such as probabilistic analysis dan amortized analysis. CO-6: understand and are able to explain the basic theory of complexity (including P, NP, SAT, reduction). CO-7: understand and are able to explain the classical theory of complexity (including P and co-NP structures, PSPACE, TQBF, Savitch's theorem).	 PLO3 PLO3 PLO3 PLO5 PLO4 PLO3 PLO3
Content	This course provides an introduction to the most important basic	

	of analysis of algorithms and complexity.
Study and examination requirements and forms of examination	• In-class exercises • Quiz 1 and 2 • Assignment 1, 2, 3 • Mid-term examination • Final examination
Media employed	LCD, whiteboard, websites (eLisa).
Assessments and Evaluation	CO-1: Question no 1 in midterm exam (10%) CO-2: Question no 2 in midterm exam (10%) CO-3: Question no 3 in midterm exam (10%), quiz 1 (5%) CO-4: Assignment 1 (5%), question no 4 in midterm exam (10%), Quiz 2 (5%) CO-5: Question no 1 in final exam (10%), question no 2 in final exam (10%) CO-6: Assignment 2 (5%), question no 3 in final exam (10%) CO-7: Assignment 3 (5%), question no 4 in final exam (5%)
Reading List	Cormen, et.al., Introduction to Algorithms, 3rd Edition, MIT Press/McGraw-Hill, 2009 Dasgupta, S., et.al., Algorithms, McGraw-Hill, 2006 Wegener, I., Complexity Theory: Exploring the Limits of Efficient Algorithms, Springer, 2005