HANDBOOK

BACHELOR OF INFORMATICS PROGRAM
DEPARTMENT OF INFORMATICS
FACULTY OF INTELLIGENT ELECTRICAL AND
INFORMATICS TECHNOLOGY
INSTITUT TEKNOLOGI SEPULUH NOPEMBER

Module name	**Graph Theory and Automata**
Module level	Undergraduate
Code	IF184604
Courses (if applicable)	**Graph Theory and Automata**
Semester	Even
Contact person	Victor Hariadi, S.Si, M.Kom
Lecturer	Victor Hariadi, S.Si, M.Kom Arya YudhiWijaya, S.Kom.,M.Kom. Dr. Ahmad Saikhu, S,Si, MT.
Language	Bahasa Indonesia and English
Relation to curriculum	1. Undergraduate degree program; mandatory; 4^{td}, 6th, 8th semester. 2. International undergraduate program; mandatory; 4^{td}, 6th, 8th semester.
Type of teaching, contact hours	1. Undergraduate degree program: lectures, < 60 students, 2. International undergraduate program: lectures, < 40 students
Workload	1. Lectures: 3 x 50 = 150 minutes (2 hours 30 minutes) 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 80% of the lectures to sit in the exams.
Mandatory prerequisites	Discrete Mathematics
	After completing this module, a student is expected to:	

Learning outcomes and their corresponding PLOs	**CO1** Students are able to implement the graph structure into array or linked-list and implement graph-based algorithm.	PLO3
	CO2 The students are having capability to applying some rules of defining languages, including some appropriate mathematical operations	PLO3
	CO3 The students are having capability to understanding some language 's modelling using finite automaton and some similar machines.	PLO3
	CO4 The students are having understanding the difference between determinism and non-determinism, and being abel to operate some appropriate machines	PLO3
	CO5 The students are having understanding the roles, techniques, and mechanism of grammar in programming languages.	PLO4
	CO6 The students are having capability to applying comptability theory	PLO4
	CO7 The students are having capability to applying complexity theory	PLO4
Content	Knowledge:
	Mastering principles and methods to solve computation problems by using calculus, matrixs, statistics, approximation, linear optimization, modelling and simulation
	Mastering principles of algorithm development and various programming language concepts;
	Specific Skill:
	Able to solve computation problems, and mathematical modelling through exact, stochastic, probabilistic, and numeric approaches effectively and efficiently
	Capable of desaining and analizing of algorithms to solve problems effectively and efficiently based on programming principles, and able to apply programming model in various programming language; and able to choose programming languages in producing appropiate applications
Study and examination requirements and forms of examination	Mid-terms examination and Final examination.
Media employed	LCD, whiteboard, websites, books (as references), etc.

Assessments and Evaluation	CO1: Problem 1 in mid-term exam (5%) and exercise 1 (5%) - 10%
	CO2: Problem 2 in mid-term exam (5%) and exercise 2 (5%) - 10%
	10%
	CO3: Problem 3 in mid-term exam (5%); problem 4 in mid-term exam (5%); assignment 1: make an algorithm and computer program (5%); and exercise 3 (5%) - 20%
	CO4: Problem 5 in mid-term exam (5%); problem 1 in final exam (5%) and exercise 4 (5%) - 15%
	CO5: Problem 2 in final exam (5%); assignment 2: make a function and recursive (5%); and exercise 5 (5%) - 15% CO6: Problem 3 in final exam (5%) and exercise 6 (5%) - 10%
	CO7: Problem 4 in final exam (5%) and exercise 7 (5%) - 10% CO8: Problem 5 in final exam (5%) and assignment 3: make a program based on a real-life problem (5%) - 10%
Reading List	Diestel, R., Graph Theory, 2000, Springer-Verlag
	Vasudev C,Graph Theory with Apllication, 2006, New Age International Publisher
	McHugh, J.A., Algorithmic Graph Theory, 1990, Prentice-Hall Inc.
	Liotta, G., Tamassia, R., Tollis, I., Graph Algorithms and Applications 2, 2004, World Scientific Pub.
	Introduction to the Theory of Computation , 3rd Edition, Cencage Learning, 2013
	Automata, Computatibility, and Complexity: Theory and Applications, Pearson International Edition, 2009