



# MODULE HANDBOOK

## Algorithm Design and Analysis

**BACHELOR DEGREE PROGRAM**  
**DEPARTMENT OF MATHEMATICS**  
**FACULTY OF SCIENCE AND DATA ANALYTICS**  
**INSTITUT TEKNOLOGI SEPULUH NOPEMBER**

# MODULE HANDBOOK

## Algorithm Design and Analysis

Module name	<b>Algorithm Design and Analysis</b>	
Module level	Undergraduate	
Code	KM184826	
Course (if applicable)	Algorithm Design and Analysis	
Semester	Spring (Genap)	
Person responsible for the module	Drs. Bandung Arry Sanjoyo M.lkomp	
Lecturer	Drs. Bandung Arry Sanjoyo M.lkomp	
Language	Bahasa Indonesia and English	
Relation to curriculum	Undergraduate degree program, <b>elective</b> 8 <sup>th</sup> semester.	
Type of teaching, contact hours	Lectures, <60 students	
Workload	<ol style="list-style-type: none"> <li>1. Lectures : 2 x 50 = 100 minutes per week.</li> <li>2. Exercises and Assignments : 2 x 60 = 120 minutes (2 hours) per week.</li> <li>3. Private learning : 2 x 60 = 120 minutes (2 hours) per week.</li> </ol>	
Credit points	2 credit points (sks)	
Requirements according to the examination regulations	A student must have attended at least 75% of the lectures to join the exams.	
Mandatory prerequisites	-	
Learning outcomes and their corresponding ILOs	<p>Course Learning Outcome (CLO) after completing this module,</p> <p>CLO-1 Be able to solve and provide alternative solutions in programming problems with algorithm approach and data structures, individually or in teamwork.</p> <p>CLO-2 Be able to understand the basics of algorithm design to build a correct and efficient algorithm.</p> <p>CLO-3 Be able to understand the basics of algorithm analysis, include time computation and memory requirements.</p>	<p>CLO-01</p> <p>CLO-02</p> <p>CLO-03</p>

	<p>CLO-4 Be able to understand and are able to implement graph algorithms.</p> <p>CLO-5 Be able to implement optimization programming algorithms.</p> <p>CLO-6 Be able to explain and analyze sorting and searching algorithms and use the appropriate methods.</p> <p>CLO-7 Be able to solve programming problems by utilizing the algorithm and analyze it intelligently and creatively.</p>	<p>CLO-04</p> <p>CLO-05</p> <p>CLO-06</p> <p>CLO-07</p>
Content	<p>Algorithm design and analysis courses cover how to transform problems into the form of input, process and output of a program. This course provides ways to design an algorithm for a problem and conduct an analysis of the algorithms that are made so that you can choose the right algorithm to be implemented into the program. Problems that often arise in computing will be examples of case studies, such as problems in searching, sorting, matrix operations, graphs, and optimization problems.</p>	
Study and examination requirements and forms of examination	<ul style="list-style-type: none"> <li>• In-class exercises</li> <li>• Mid-term examination</li> <li>• Final examination</li> </ul>	
Media employed	<p>LCD, whiteboard, websites (myITS Classroom), zoom.</p>	
Reading list	<p>Main :</p> <ol style="list-style-type: none"> <li>1. Sara Baase and Allen Van Gelder, Computer Algorithms: Introduction to Design and Analysis 3rd Ed., Addison-Wesley, 2000.</li> <li>2. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, Introduction to Algorithms, 3rd ed. , MIT Press, 2009.</li> </ol> <p>Supporting :</p> <p>Clifford A. Shaffer, Data Structures and Algorithm Analysis, Java edition, Prentice Hall 2013.</p>	