



Module Description

Module name	Algorithms and Data Structures
Module level, if applicable	Bachelor of Informatics
Code, if applicable	21D12110604
Subtitle, if applicable	-
Course, if applicable	-
Semester(s) in which the module is taught	2 nd
Person responsible for the module	Dr. Ir. Ingrid Nurtanio., MT
Lecturer	<ol style="list-style-type: none"> 1. Dr. Ir. Ingrid Nurtanio., MT 2. Dr. Amil Ahmad Ilham., ST., M.IT 3. Adnan., ST., MT., PhD 4. Anugrayani Bustamin., ST., MT 5. Elly Warni, ST., MT
Language	Indonesian Language [Bahasa Indonesia]
Relation to Curriculum	This course is a compulsory course and offered in the 2 nd semester.
Type of teaching, contact hours	Teaching methods: [collaborative learning], [problem-based learning]. Teaching forms: [lecture], [tutorial], [practicum]. CH : 08.00 - 16.00
Workload	For this course, students are required to meet a minimum of 181.33 hours in one semester, which consist of: <ul style="list-style-type: none"> - 53.33 hours for lecture, - 64 hours for structured assignments, - 64 hours for private study,



Credit points	4 credit points (equivalent with 6.8 ECTS)
Requirements according to the examination regulations	Students have participated in at least 80% of the learning activities (Academic Regulations, Chapter VII)
Recommended prerequisites	Basic Computer Programming
Module objectives/intended learning outcomes	<p>After completing the course, Students are able:</p> <p>Intended Learning Outcome (ILO):</p> <p>ILO 1 : Have the knowledge of fundamental in Computing Science that includes basic theory and concepts of computer science, Mathematics and Statistics, Programming Algorithm, Software Engineering, Information Management and Digital Resilience, also the advance topics of either Artificial Intelligence, Data Science, Computer Network, Cloud Computing or Internet of Things</p> <p>ILO 3 : Apply the knowledge of computing and other related disciplines to analyse and identify solutions for any computing-based problem.</p> <p>Course Learning Objectives (CLO):</p> <p>CLO 1 : students can understand the concept of algorithms, basic algorithm, flowchart, selection, procedures, functions, and text processing and array.</p> <p>CLO 2 : Students apply the knowledge to determine the characteristics of search techniques, sorting techniques and analyze the complexity of the algorithm, struct and the concept of a linked list, queue and stack, graph technique, and tree.</p>
Content	<p>Students will learn about :</p> <ol style="list-style-type: none"> 1. Algorithm Concept



	<ol style="list-style-type: none"> 2. Basic Algorithm (Rules for Writing Headers, declarations, and descriptions) 3. Flowcharts (Symbols, variables, branch algorithms, sequences) 4. Selection (Control Flow and Repeat) 5. Procedures, Functions, and Text Processing 6. Arrays 7. Search (Binary Search) 8. Search (Sequential Search) 9. Bubble and Insertion Sort 10. Merge and selection sort 11. Quicksort and algorithm complexity 12. Structure and Linked List 13. Queue and Stack 14. A directed and undirected graph 15. Tree
<p>Forms of Assessment</p>	<p>Assessment techniques: [participation], [written test].</p> <p>Assessment forms: [quiz], [midterm exam], [finalterm exam], [assignment].</p> <p>Quiz = 10%, Midterm exam = 15%, Final term exam = 25%, Assignment1 = 25%, Assignment2 = 25%</p> <p>CLO 1 => ILO 1: 50% (Quiz and Midterm exam: written test, Assignment: participation)</p> <p>CLO 2 => ILO 3: 50% (Assignment: participation, Final term exam: written test)</p>
<p>Study and examination requirements and forms of examination</p>	<p>Study and examination requirements:</p> <ul style="list-style-type: none"> - Students must attend 15 minutes before the class starts. - Students must switch off all electronic devices. - Students must inform the lecturer if they will not attend the class due to sickness, etc. - Students must submit all class assignments before the deadline. <p>Form of examination: Written exam: Essay</p>
<p>Media employed</p>	<p>Video conference, Slide Presentation, Learning Management System (LMS).</p>
<p>Reading list</p>	<p>Main :</p>



	<ol style="list-style-type: none">1. Munir, Rinaldi and Lidya, Leony. 2016. <i>Algoritma dan Pemrograman dalam Bahasa Pascal, C dan C++ Edisi Keenam</i>. Informatika : Bandung2. Gozali, William and Aji, Alham Fikri. 2014. <i>Pemrograman Kompetitif Dasar. Ikatan Alumni Tim Olimpiade Komputer Indonesia</i>.3. Zakaria, Teddy M and Prijono, Agus. 2005. <i>Konsep dan Implementasi Struktur Data</i>. Informatika : Bandung.
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