Algorithm and Programming

Module name	Algorithm and Programming	
Module level	Undergraduate	
Code	IF221106	
Courses (if applicable)	Algorithm and Programming	
Semester	2	
Lecturer	Retno Mumpuni, S.Kom, M.Sc. (PIC) Made Hanindia Prami S, S.Kom, M.Cs. Fetty Tri Anggraeny, S.Kom, M.Kom. Afina Lina Nurlaili, S.Kom., M.Kom.	
Language	Bahasa Indonesia and English	
Relation to curriculum	Undergraduate degree program; compulsory; 2nd semester	
Type of teaching, contact hours	Lectures, < 60 students,	
Teaching Methods	simulation, collaborative learning, cooperative learning, problem-based learning	
Workload	1. Lectures: 3 sks 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	-	
Courses description	In this course, students learn How to Solve Problems through Logistic Sequencing (Algorithm) and Programming. Algorithms are used to understand how computer programs solve problems through a sequence of logistic steps, starting from understanding the basic concept of algorithms, implementing algorithms into a program, concepts of input, processing, output, branching concepts, branching placement, looping concepts, looping placement, arrays, procedures/functions, recursion, introduction to the C programming language, conditional branching programming, array programming, programming procedures/functions, programming pointer, implementing algorithms that match the above-mentioned concepts as solutions in programming.	
Learning outcomes and their corresponding PLOs	After completing this module, a student is expected to:	
	CO1 Accuracy in explaining Algorithm, discussing examples of algorithms, and following the correct way to create an algorithm.	PLO3, PLO5, PLO8
	CO2 Accuracy in Having a basic programming logic skill to solve simple problems.	PLO3, PLO5, PLO8
	CO3 Accuracy in explaining create programs by applying various basic programming algorithms.	PLO3, PLO5, PLO8

Content	Definitions and roles of information systems and technology; Definition of Algorithms, Basics of Algorithm Design, Basic Algorithm Structure, Input Concept, Processing, Output Concept, Branching Concept, Nested Branching, Looping Concept, Nested Loops, Arrays, Procedures/Functions, Recursion, Introduction to the C Programming Language, Conditional Branching Programming, Array Programming, Procedure/Function Programming, Pointer Programming, Implementation of Algorithms according to the above concepts as solutions in programming.
Media employed	LCD, whiteboard, websites, books (as references), online meeting, etc.
Assessments and Evaluation	One written Midterm assessment (60 minutes) and one final oral exam (30 minutes), two short computer-based quizzes, takehome written assignments
Study and examination requirements and forms of examination	The final grade in the module is composed of: • Two short computer-based quizzes: 15% x 2 = 30% • Take-home written assignments: 15% • Written Midterm assessment: 25% • Final oral exam: 30% Students must have a final grade of 55.6% or higher to pass.
Reading List	● K. D. Lee, S. Hubbard, Data Structures and Algorithms with Python: With an Introduction to Multiprocessing, 2nd edition. Springer, 2024. ● M. Bancila, A. Sharma, R. Rialdi, Learn C# 8: A beginner's guide to building a solid foundation for C# programming. Packt Publishing, 2020. ISBN: 9781789805864. [Online]. Available: https://portal.igpublish.com/iglibrary/obj/PACKT0005616?searchid=1754988066930EXXRb3ZgOZufFu1_EWb4d ● A. Soni, C Programming to Improve Coding Skills: Only Learning and Algorithm based Programs with Source Code. Independently Published, 2024. ● P. Chris, Learn To Program, 3th Edition. The Pragmatic Programmers, 2021. ● M. McGrath, C++ Programming in Easy Steps, 6th Edition. In Easy Steps, 2022.