FI242 Algorithm and Programming

Module name:	Algorithm and Programming
Module level, if applicable:	Undergraduate
Code:	FI242
Sub-heading, if applicable:	-
Classes, if applicable:	-
Semester:	4th
Module coordinator:	Waslaluddin
Lecturer(s):	Waslaluddin
Language:	Bahasa Indonesia
Classification within the curriculum:	Compulsory

Type of Teaching:	Contact hours per week during the semester	Class Size
1. Lecture (conceptual, contextual and problem-solving approaches through expository, discussions and experiment). 2. Structured activities (assignments based on conceptual, contextual and problem-solving approaches) 3. Self-study (reading literature)	2 hours 30 minutes	35
Workload:	The total workload is 136 hours/8160 minutes (4.8 ECTS) per semester, consisting of 35 hours/2100 minutes lectures (1.24 ECTS), 42 hours/2520 minutes structured activities (1.48 ECTS) and 42 hours/2520 minutes self-study (1.71 ECTS) per week for 14 weeks, 17 hours/1020 minutes for two exams (0.6 ECTS).	
Credit points:	4.8 ECTS	
Pre-requisites course(s):	FI120 Basic Mathematics	
Course Learning Outcomes (CLO):	After taking this course the students have ability to: CLO1: Explain Algorithm, Basic Algorithm Structure, Algorithmic Notation, Types of operators and expressions. CLO2: Apply a certain programming language to execute/ run algorithms. CLO3: Apply information technology to engineer algorithms into programming languages. CLO4: Formulate physical symptom algorithms through programming languages for physical symptom solutions. CLO5: Generate physical model algorithms for implementation in programming languages. CLO6: Analyse alternative solutions in various physical symptom solution algorithms. CLO7: Report the results of making physical symptom	

	application products through the stages of algorithms, data structures and programming.
Content:	Algorithms and Programming are compulsory basic programming skills, but because they must be applied to physics problems and prioritize computer simulations, the position of this course is placed after Basic Physics as a necessary condition. This course provides an understanding of factual knowledge, conceptual and procedural principles, concepts and techniques of Algorithms and computer Programming and practice and can apply them to problems of physics relevant. Able to solve problems in the field of physics application systems systematically with planning based on algorithms. Mastering basic knowledge of programming algorithms. Knowing the Programming language platform such as C and Java. The material for this course includes (1) Introduction to Algorithms (2) Basic structure of algorithms (3) Algorithmic Notation (4) Types of operators and expressions (5) Sequencing (6) Selection/conditional (7) Looping (8) Introduction to Programming Modular (Procedures and Functions) (9) Array (10) Matrix (11) Search Algorithm (12) Sort Rhythm (13) Recursive Rhythm Algorithm

Study/exam achievements:

The final mark will be weight as follow:

No	CLO	Assessment Object	Assessment Techniques	Weight
1	CLO1 – CLO6	Subject specific competences: a. Individual assignments b. Exam - Mid exam - Final exam	Written Written Test Written Test	20 % 25% 25%
2	CLO7	Subject specific competences: c. Class Activity d. Experiment report	Performance Written	10% 20%
Total				100%

Forms of media:	Board, LCD Projector, Laptop/Computer, LMS
Literature:	1. Lee, K. D., & Hubbard, S. (2015). *Data structures and algorithms with Python*. Springer. 2. Chun, W. (2012). Core Python applications programming. Prentice Hall. 3. Jaworski, Michał., & ZiadéT. (2019). *Expert Python Programming: Become a Master in Python by Learning Coding Best Practices and Advanced Programming Concepts in Python 3.7*. Packt Publishing, Limited. 4. Waslaluddin (2019) *Practical Instructions*, unpublished

PLO and CLO mapping

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PLO12
CLO1			√									
CLO2			√									
CLO3			√									
CLO4					√							
CLO5					√							
CLO6					√							
CLO7					√							