HANDBOOK

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

Module name	**Numerical Computation**
Module level	Undergraduate
Code	IF184303
Courses (if applicable)	**Numerical Computation**
Semester	Fall (Gasal)
Contact person	Victor Hariadi, S.Si, M.Kom
Lecturer	Victor Hariadi, S.Si, M.Kom Dr. Ahmad Saikhu, S,Si, MT.
Language	Bahasa Indonesia and English
Relation to curriculum	1. Undergraduate degree program; mandatory; 3rd, 5th, or 7th semester. 2. International undergraduate program; mandatory; 3rd, 5th, or 7th 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	A student must have attended at least 80% of the lectures to sit in the exams.

regulations	
Mandatory prerequisites	Math 2
	After completing this module, a student is expected to:

Learning outcomes and their corresponding PLOs	**CO1** The students being able to understanding significant figures, round-off errors, and Taylor series.	PLO3
	CO2 The students being able to using several methods to finding roots of equation.	PLO3
	CO3 The students being able to using several methods for curve fitting with regression and interpolation techniques.	PLO3
	CO4 The students being able to using several numerical methods for finding approximation value for finite-difference	PLO3
	CO5 The students being able to using several numerical methods for finding integration value	PLO4
	CO6 The students being able to using several numerical methods for finding the value of differentiation of function with single free's variable.	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%
	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	Chapra, S.C., Canale, R.P., "Numerical Methods for Engineers 6th Ed", McGraw-Hill, 2010
	Hariadi, V., "Bahan Ajar Komputasi Numerik", 2014