Module Description

Module name	Numerical Computing Method
Module level, if applicable	Bachelor of Informatics
Code, if applicable	21D12121003
Subtitle, if applicable	-
Course, if applicable	-
Semester(s) in which the module is taught	4th
Person responsible for the module	Dr. Ir. Ingrid Nurtanio., MT
Lecturer	1. Dr. Amil Ahmad Ilham., ST., MIT 2. Dr. Ir. Ingrid Nurtanio., MT 3. Prof. Dr. Eng. Syafaruddin., ST., M.Eng 4. Dr. Ir. H. Rhiza S. Sadjad., MSEE 5. Dr. Eng. Ady Wahyudi Paundu., ST., MT
Language	Indonesian Language [Bahasa Indonesia]
Relation to Curriculum	This course is a compulsory course and offered in the 4th semester.
Type of teaching, contact hours	Teaching methods: [simulation], [case study], [problem-based learning]. Teaching forms: [lecture], [tutorial]. CH : 08.00 - 16.00
Workload	For this course, students are required to meet a minimum of 136.00 hours in one semester, which consist of: - 40.00 hours for lecture, - 48.00 hours for structured assignments, - 48.00 hours for private study
Credit points	3 credit points (equivalent with 5.1 ECTS)

Requirements according to the examination regulations	Students have participated in at least 80% of the learning activities (Academic Regulations, Chapter VII)
Recommended prerequisites	Linear Algebra, Probability and Statistics.

Module objectives/intended learning outcomes	After completing the course, Students are able:
	
	Intended Learning Outcomes (ILO):
	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.
	
	ILO 3 :
	Apply the knowledge of computing and other related disciplines to analyse and identify solutions for any computing-based problem
	
	Course Learning Objective (CLO):
	Students understand the basic principles of Numerical Analysis concepts and are able to analyze and identify solutions for real-life engineering problems by modeling the problem into the digital and discrete domain of the computer system.
	
	Sub CLO :
	ILO 1 $\Rightarrow$ CLO 1:
	    Students understand the basics of numerical analysis.
	ILO 3 $\Rightarrow$ CLO 2:
	    Students are able to model Interpolation, Extrapolation, Regression, Root Finding and Optimization problems into the digital and discrete domain of the computer system.
	ILO 3 $\Rightarrow$ CLO 3:
	    Students are able to model Integration, Differentiation, Initial Value problems and Two Point Boundary problems into the digital

	and discrete domain of the computer system.
Content	Students will learn about : 1. Modelling and Errors 2. Basic of Numeric Computation 3. Linear Algebra 4. Taylor Series 5. Interpolation and Extrapolation 6. Regression 7. Root Finding 8. Optimization 9. Integration and Differentiation 10. Initial Value Problem 11. Two Point Boundary Problem
Forms of Assessment	Assessment techniques: [observation], [performance], [written test]. Assessment forms: [midterm exam], [assignment].
Study and examination requirements and forms of examination	**Study and examination requirements:** - 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. - Students must attend the exam to get the final grade. **Form of examination:** Written exam
Media employed	Video conference, Slide Presentation, Learning Management System (LMS).
Reading list	**Main :** 1. Numerical Methods and Modelling for Engineering, Richard Khoury and Douglas Wilhelm Harder, Springer, 2016

In the "Forms of Assessment" row:

CLO 1	CLO 2		CLO 3	
Exam 1	Assign 1	Exam 2	Assign 2	Exam 3
20	20	20	20	20

| | 2. Advanced Engineering Mathematics, Kreyszig Kreyszig, 10th Edition, John Wiley & Sons, Inc., 2011 |
| | 3. Numerical Recipes: The Art of Scientific Computing; W.H. Press, S.A. Teukolsky, W.T. Vetterling, B.P. Flannery; Cambridge Press, 2007 |