MODULE HANDBOOK
NUMERICAL PARTIAL DIFFERENTIAL EQUATIONS

BACHELOR DEGREE PROGRAM
DEPARTMENT OF MATHEMATICS
FACULTY OF SCIENCE AND DATA ANALYTICS

INSTITUT TEKNOLOGI SEPULUH NOPEMBER

MODULE HANDBOOK

NUMERICAL PARTIAL DIFFERENTIAL EQUATIONS

Module name	**NUMERICAL PARTIAL DIFFERENTIAL EQUATIONS**
Module level	Undergraduate
Code	KM184825
Course (if applicable)	NUMERICAL PARTIAL DIFFERENTIAL EQUATIONS
Semester	Spring (Genap)
Person responsible for the module	**Drs. Lukman Hanafi, M.Sc**
Lecturer	**Drs. Lukman Hanafi, M.Sc**
Language	Indonesia and English
Relation to curriculum	Undergraduate degree program, **elective**, 8th semester.
Type of teaching, contact hours	Lectures, <60 students
Workload	1. Lectures : 2 x 50 = 100 minutes per week. 2. Exercises and Assignments : 2 x 60 = 120 minutes (2 hours) per week. 3. Private learning : 2 x 60 = 120 minutes (2 hours) per week.
Credit points	2 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	Partial Differential Equations Numerical Differential Equations Numerical Method
Learning outcomes and their corresponding PLOs	Course Learning Outcome (CLO) after completing this module, 1. Students are able to follow the development and apply math and able to communicate actively and correctly, either oral or written. 2. Students are able to explain the basic principles of Partial Differential Equations consisting of Parabolic PDP, Elliptical PDP and Hiperbolic PDP. 3. Students are able to understand the settlement of PDP by using numerical with several methods.
Content	In this course we will study the methods of solving partial differential equations numerically, either single step or multistep. In addition will also be given a representation of the difference up. The topics related to this course are the completion of partial, elliptical and hyperbolic partial differential equations. Completion of the Elliptical

	PDP by using the Laplace equation. The completion of the Parabolic PDP uses an explicit scheme and an implicit scheme. The completion of the Hiperbolic PDP uses different schemes and characteristic methods. In this course students will study the following subjects: Definitions of Partial Differential Equations, Parabolic PDP and solutions (explicit and implicit schemes), Eliptic PDPs with their solutions (ADI and SOR schemes) and Hiperbolic PDPs with completion (finite different schemes and characteristic methods).
Study and examination requirements and forms of examination	• In-class exercises • Assignment 1, 2 • Mid-term examination • Final examination
Media employed	LCD, whiteboard, websites (myITS Classroom), zoom.
Reading lists	Main: 1. Steven C. Chapra&Raymond P. Canale, 2010. "Numerical Methods for Engneers 6th edition", McGraw-Hill, Higher Education, Boston, USA. 2. Burden, R.C., Faires J.D. , Reynolds, A.C., 2011, " Numerical Analysis, 9th edition", Brooks/Cole Cengage Learning, Boston. Supporting: 1. Volker John, 2013, "Numerical Methods for Partial Differential Equations", Press, New York 2. Soehardjo, " Refreshing Mathematics ", 1997, ITS, Surabaya.