

ME2202 - Numerical Methods in Meteorology

COURSE LESSON PLAN				
STUDY PROGRAM: METEOROLOGY				
FACULTY/SCHOOL: FACULTY OF EARTH SCIENCES AND TECHNOLOGY				
INSTITUT TEKNOLOGI BANDUNG				
Course Code: ME2202		Credits: 3	Semester: 4	Course Type: Compulsory course
Course Name		Metode Numerik Meteorologi		
		Numerical Methods in Meteorology		
Related Course		ME2102	Computational Meteorology	Pre-requisite
Study Materials		Numerical methods for finding roots of non-linear equations (global and local convergence methods).		Expose
		Numerical methods for solving systems of linear equations (row reduction and iterative methods).		Expose
		Numerical integration: Riemann summation, trapezoidal method, Simpson 1/3 and 3/8 rules, Romberg method, and Gaussian quadrature.		Expose
		Numerical derivatives: Taylor series, finite difference method, first and second derivatives (orders 1 and 2), Jacobian and Laplacian operators.		Expose
		Numerical methods for solving differential equations: hyperbolic PDEs (advection), parabolic PDEs (diffusion), and elliptic PDEs (2D plate conduction)).		Expose
Learning Outcomes				
Code		LO		
PLO-1.1		Able to use basic science and mathematics as a foundation for understanding the fundamentals of meteorology. (C3)		
PLO-3.3		Able to operate computing devices in accordance with the algorithms learned, to solve a standard scientific problem in the field of meteorology. (C3)		
Code	CO	Elements of Course Learning Outcomes (CO)		
PLO-1.1	1	Students are able to implement numerical methods for various simple mathematical problems. (C3)		
PLO-3.3	2	Students are able to develop simple computer programs to solve simple mathematical problems numerically. (C3)		
Learning Methods		Lecture Group Discussion Cooperative Learning Problem-based Learning		
Learning Modalities		Synchronous learning Blended/Online Asynchronous		
Assessment Method		Assessment components: Midterm Examination (30%), Final Examination (30%), Laboratory/Practicum (30%), Assignments (5%), and Quizzes (5%). Grading Scale: 80–100% A (maximum competency) 75–80% AB (very good competency) 65–75% B (good competency) 60–65% BC (satisfactory competency) 55–60% C (minimum competency) 45–54% D (below minimum competency) <45% E (far below minimum competency)		