UNIVERSITAS NEGERI PADANG
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
MATHEMATICS DEPARTMENT, MATHEMATICS STUDY PROGRAM
Main Campus Universitas Negeri Padang.
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Bachelor of Science in Mathematics MODULE HANDBOOK

Module name:	Complex Analysis
Module level, if applicable:	Bachelor
Code:	MAT1.62.7001
Subheading, if applicable:	-
Classes, if applicable:	Complex Analysis
Semester:	7th (seventh)
Module coordinator:	Head of Analysis Expertise Group
Lecturer(s):	Dr. Arnellis, M.Si. and Defri Ahmad, S.Pd., M.Si.
Language:	Indonesian Language and English
Classification within the curriculum:	Compulsory course in fourth year (7th semester) Bachelor Degree
Teaching format / class hours per week during the semester:	a. Lectures: Problem Based Learning with methods such as expository, discussion, and drill. (4 x 50 minutes = 200 minutes). b. Structured assignment: Weekly individual/group written assignment. (4 x 60 minutes = 240 minutes). c. Individual study (4 x 60 minutes = 240 minutes)
Workload:	The total workload is 181,33 hours per semester, which consists of 200 minutes lectures, 240 minutes structured activities, and 240 minutes of self-study. In total, there are 16 weeks per semester, including midterm and final exams.
Credit points:	4 SKS= 6,04 ECTS
Prerequisites course(s):	Students have taken Advanced Calculus and have participated in the final examination of the course.
Course Outcomes:	After completing this course, the students have ability to: CO1. State some operations in complex systems. CO2. Interpret calculus concepts in complex system, such as: limit, continuity, and derivative. CO3. Justifying a function is analytic or not. CO4. Analyze the derivative of elementary functions. CO5. Evaluate the integral of elementary functions CO6. Generalize complex series

Content:	1. Complex numbers system: notation, algebraic operation, geometric interpretation, modulus, polar form, power and roots of complex numbers.
	2. Topology on complex numbers systems.
	3. Analytic functions: complex functions, mapping, limits, properties of limits, limit involving a point at infinity, continuity, derivative, differentiation formulate Cauchy-Riemann Equations, sufficient conditions, polar coordinates, analytic functions, harmonic functions.
	4. Derivative of elementary functions: exponential function and its properties, trigonometric functions, hyperbolic functions, logarithmic functions and their branches, properties of logarithmic function, complex exponent, inverse of trigonometric and hyperbolic functions.
	5. Integral of complex function, Cauchy Goursat theorem, formula of Cauchy integral,
	6. Complex Series: Taylor, Mc Laurin, and Laurent Series.
Study/exam achievements:	The final grade will be weighted as follows: The assessment consists of a final exam (45%), a midterm exam (30%), assignment (20%), and participation/ discussion (5%). The final and midterm exams are essay tests with a closed book (120 minutes). Weekly assignments (solving selected problems) are given in two forms; group or individual assignments.
Forms of media:	White Board, laptop, projector, e-learning via elearning2.unp.ac.id, and zoom meeting.
Literature:	1. James Ward Brown and Ruel V. Churchill, R, 2013, *Complex Variable and Applications,* 9th Edition, McGraw-Hill. 2. Soemantri R (1994) Fungsi Variabel Kompleks Jakarta: Depdikbud. 3. Murray, R.S (1998) Peubah Kompleks (Terjemahan) Jakarta:Erlangga.

PLO and CO Mapping

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
CO1									✓	
CO2									✓	
CO3									✓	
CO4				✓						
CO5				✓						
CO6				✓						