



UNIVERSITAS NEGERI PADANG
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
MATHEMATICS DEPARTMENT, MATHEMATICS EDUCATION STUDY PROGRAM
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Bachelor of Mathematics Education

MODULE HANDBOOK

Module name:	Numerical Method
Module level, if applicable:	Bachelor
Code:	MAT2.61.6104
Sub-heading, if applicable:	-
Classes, if applicable:	Numerical Method
Semester:	8 th (eight)
Module coordinator:	Dra. Minora Longgom Nasution, M. Pd.
Lecturer(s):	Dra. Minora Longgom Nasution, M. Pd., and team
Language:	Bahasa Indonesia
Classification within the curriculum:	Study Program Elective Course
Teaching format / class hours per week during the semester:	Teaching format: <ul style="list-style-type: none">• Lectures (face to face activities): by Problem Based Learning with method such as Explanation, Group and Class Discussion.• Structured assignment• Independent activities• Practice 3 x 170 minutes = 510 minutes = 8.50 hours
Workload:	16 weeks per semester include Midterm Exam and Final Exam which consist of: <ul style="list-style-type: none">• 1.67 hours lectures (2 x 50 minutes) per week• 2 hours structured assignments (2 x 60 minutes) per week• 2 hours independent activities (2 x 60 minutes) per week• 2.83 hours practice (1 x 170) per week 16 x 170 x 3 = 8160 Minutes = 136 hours = 4.53 ECTS
Credit points:	3 SKS (4.53 ECTS)

Prerequisite's course(s):	-
Course outcomes:	<p>After taking this course the students have ability to:</p> <p>CO1 : Interpret the concepts of computational error, algorithms, error propagation, point fold, direct and indirect calculation, nonlinear equation roots, iterative solution method, unequal interpolation, equidistant interpolation system of linear equations, reverse and forward recovery, triangular decomposition, and iteration method solutions</p> <p>CO2 : Apply the concepts of computational error, algorithms, error propagation, point fold, direct and indirect calculation, nonlinear equation roots, iterative solution method, unequal interpolation, equidistant interpolation system of linear equations, reverse and forward recovery, triangular decomposition, and iteration method solutions</p> <p>CO3 : Analyze the problems that connect to the concepts of computational error, algorithms, error propagation, point fold, direct and indirect calculation, nonlinear equation roots, iterative solution method, unequal interpolation, equidistant interpolation system of linear equations, reverse and forward recovery, triangular decomposition, and iteration method solutions</p> <p>CO4 : Show the responsibility attitude in own work</p> <p>CO5 : Maintain the responsibility attitude in team works</p>
Content:	<p>This course discusses:</p> <ol style="list-style-type: none"> 1. the definition computational error, algorithms, error propagation, point fold, direct and indirect calculation, 2. Finding computational error, algorithms, error propagation, point fold, 3. Finding roots of nonlinear equations with direct and indirect calculation (nonlinear equation roots the bisection method, regula-falsi method, Newton and Secant methods. Polynomial interpolation by using Newton Raphson Method, Newton's interpolation, Lagrange interpolation)

Study/exam achievements:	<p>Total score= (30% x Midterm Exam Score) + (35% x Final Exam Score) + (20% x Assignment Score) + (15% x Affective Score: responsibility and attendance)</p> <p>The initial cut - off points for grades A, A⁻, B⁺, B, B⁻, C⁺, C, C⁻, and D should not be less than 85, 80, 75, 70, 65, 60, 55, 50, and 40 out of 100 respectively.</p> <p>Explanation:</p> <p>1. Midterm Exam</p> <ul style="list-style-type: none"> ✓ Midterm Exam will be conducted in the 9th meeting ✓ Midterm Exam is in the form of a written test (essay) and will be conducted in the classroom ✓ The time allocation is 120 minutes according to the module schedule <p>2. Final Exam</p> <ul style="list-style-type: none"> ✓ Final Exam will be conducted in the 16th meeting. ✓ Final Exam is in the form of a written test (essay) and will be conducted in the classroom. ✓ The time allocation is 120 minutes which follows the Final Exam schedule provided by the Department. <p>3. Assignment</p> <ul style="list-style-type: none"> ✓ Assignments are given as exercise before Midterm Exam and before Final Exam ✓ Assignment are given as individual. Students use the Numerical Method to solve mathematic problems. ✓ Assignments are about analyzing problems in daily life and solving them with the concept of the content in numerical method. ✓ Assignments are given as individual tasks and it is submitted in a limited time. <p>4. Affective Assessment</p> <ul style="list-style-type: none"> ✓ Affective asesment is held in every meeting by observing students' attitude in the classroom. ✓ The assesment is based on the observation sheet by using the given scoring rubrics.
Forms of media:	Board, LCD Projector, Laptop/Computer
Literature:	<ol style="list-style-type: none"> 1. Steven Chapra and Raymond Canale. (2012). Numerical Method of Enginers,Mc Graw Hill. 2. Schiesser, W. E. (2012). The numerical method of lines: integration of partial differential equations. Elsevier. 3. Epperson, J.F. (2007). An introduction to Numerical Methods and Analysis. Canada: John Wiley & Sons, Inc.

