UNIVERSITAS NEGERI YOGYAKARTA
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
DEPARTMENT OF MATHEMATICS EDUCATION
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Bachelor of Education in Mathematics **MODULE HANDBOOK**

Module name:	Numerical Methods
Module level,if applicable:	Undergraduate
Code:	MAT6332
Sub-heading,if applicable:	-
Classes,if applicable:	-
Semester:	6th
Module coordinator:	Sahid, M.Sc
Lecturer(s):	Sahid, M.Sc.; Fitriana Yuli S., M.Si.; Nikenasih B, M.Sc.
Language:	Bahasa Indonesia
Classification within the curriculum:	Compulsory course
Teaching format / class hoursperweekduring the semester:	150 minutes lectures and 180 minutes structured activities per week.
Workload:	Total workload is 136 hours per semester which consists of 150 minutes lectures, 180 minutes structured activities, and 180 minutes self study per week for 16 weeks.
Creditpoints:	3
Prerequisites course(s):	Algorithms and Programming (MAT 6310)
Course outcomes:	After taking this course the students have ability to: CO1. Explain the meaning of numerical methods and the importance of numerical methods in solving mathematical problems CO2. Explain the concept of errors and concepts related to errors in numerical computing, both theoretically and practically

	CO3. Use special math software (Euler Maths Toolbox, Octave, SCILAB, or MATLAB, etc.) to implement algorithms in numerical methods CO4. Using a numerical method that is suitable for determining the completion of a system of linear equations (SPL) CO5. Using a numerical method that is suitable for calculating the approximation solution of a nonlinear equation CO6. Using a numerical method that is suitable for calculating the approximation value of a function (interpolation) CO7. Using a numerical method that is suitable for calculating the approximation solution of derivative CO8. Using numerical methods that are suitable for calculating the aproximation solution of integral CO9. Using the numerical method that is suitable for calculating the approximation solution to ordinary differential equations (initial value problem)
Content:	The course discusses about errors in numerical approximation, numerical system solving of linear equations, numerically almost non-linear root equations, numerical interpolation, degradation and integration, and numerical solving of ordinary differential equations (initial value problems). Some numerical methods for solving mathematical problems are introduced in this course. There is a practical activity using a computer program (Euler Maths Toolbox, Octave, SCILAB, or MATLAB, etc.) to implement algorithms and solve numerically related mathematical problems.
Study/examachievements:	Attitude assessment is carried out at each meeting by observation and / or self-assessment techniques using the assumption that basically every student has a good attitude. The student is given a value of very good or not good attitudeif

<table>
<tr><td></td><td>they show it significantlycompared to other students in general. The result of attitude assessment is not a component of the final grades, but as one of therequirements to pass the course. Students will pass from this course if at least have a good attitude. The final mark will be weight as follow:
<table>
<tr><th>No</th><th>CO</th><th>Assessment Object</th><th>Assessment Technique</th><th>Weight</th></tr>
<tr><td>1</td><td>CO 1-CO 9</td><td>a. Individual assignment
b. Group assignment
c. Quiz
d. Mid Exam
e. Final Exam</td><td>Written test</td><td>15%
15%
10%
30%
30%</td></tr>
<tr><td colspan="4">Total</td><td>100%</td></tr>
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</td></tr>
<tr><td>Forms of media:</td><td>Board, LCD Projector, Laptop/Computer</td></tr>
<tr><td>Literature:</td><td>1. Pengantar Komputasi Numerik dengan MATLAB (2005) oleh Sahid (Penerbit Andi Yogyakarta).
2. Handout Metode Numerik (Sahid, 2008-2009, FMIPA UNY).
3. Applied Numerical Methods with Matlab for Engineers and Scientists, third edition (2012) oleh Steve Chapra. (The McGraw-Hill Companies, Inc.).
4. Numerical Analysis, 9 th edition (2011), oleh Richard L. Burden & J. Douglas Faires. (Brooks/Cole, Cengage Learning.)</td></tr>
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PLO and CO mapping

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11	PLO12
CO1		✓										
CO2						✓						
CO3				✓								
CO4						✓						
CO5						✓						
CO6						✓						
CO7							✓					
CO8							✓					
CO9							✓					