



## Module Description of Numerical methods

Module Name	:	Numerical methods
Module Level	:	Bachelor
Code, if applicable	:	23H01120503
Subtitle, if applicable	:	-
Courses, if applicable	:	Numerical method
Semester(s) in which the module is taught	:	3 (Third Semester)
Module coordinator(s)	:	Agustinus Ribal, S.Si., M.Sc., Ph. D
Lecturer(s)	:	Prof. Dr. Syamsuddin Toaha, M.Sc. Agustinus Ribal, S.Si., M.Sc., Ph. D
Language	:	Bahasa (Indonesian language)
Relation to curriculum	:	Compulsory course in second year for Bachelor degree in Mathematics
Type of teaching/teaching method	:	Lecturing, Small Group Discussion, Collaborative Learning
Contact hours	:	150 minutes Lectures per week, 180 minutes Structured Assignments per week, and 180 minutes Independent Study per week
Workload	:	Total workload is 135 hours per semester which consists of 40 hours per semester for Lectures, 47.5 hours per semester for Independent Study, and 47.5 hours per semester for Structured Assignments
Credit points	:	3 (4.8 ECTS)
Requirements according to the examination regulations	:	Students are required to attend at least 80% of the total meetings which is recorded via the attendance menu at <a href="https://sikola-v2.unhas.ac.id/">https://sikola-v2.unhas.ac.id/</a> , complete all mandatory assignments, and obtain permission from the lecturer to participate in the written examination.
Recommended prerequisites	:	Students have completed and taken the exams for Basic Mathematics I, Basic Mathematics II, Algorithms and Programming
Module objectives/intended learning outcomes	:	After the completion of this module, the student will be able to: CLO 1. identifying techniques and methods in numerical methods and establishing connections to solve numerical problems; CLO 2. applying concepts effectively to solve numerical method problems in mathematics, science, and engineering; CLO 3. demonstrating an understanding of numerical methods concepts through the use of appropriate technology; CLO 4. communicating mathematical ideas in appropriate contexts, both orally and in writing, particularly with numerical methods.



		<p>The following is the mapping of the ILO and the CLO of this course:</p> <table><tr><th></th><th>ILO 2</th><th>ILO 3</th><th>ILO 6</th><th>ILO 7</th><th>ILO 9</th></tr><tr><th>CLO 1</th><td>X</td><td>X</td><td></td><td></td><td></td></tr><tr><th>CLO 2</th><td>X</td><td>X</td><td></td><td></td><td>X</td></tr><tr><th>CLO 3</th><td>X</td><td></td><td>X</td><td></td><td></td></tr><tr><th>CLO 4</th><td>X</td><td></td><td></td><td>X</td><td></td></tr></table>		ILO 2	ILO 3	ILO 6	ILO 7	ILO 9	CLO 1	X	X				CLO 2	X	X			X	CLO 3	X		X			CLO 4	X			X	
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CLO 1	X	X																														
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CLO 3	X		X																													
CLO 4	X			X																												
Content	:	<p>Numerical Methods is a compulsory subject that provides fundamental and essential concepts in numerical computation. This course offers students the opportunity to develop creative thinking skills in solving numerical problems, with an emphasis on extensive problem-solving practice ranging from simple to complex cases. In addition, students will gain expertise in using computer tools to create simple simulations for better understanding of mathematics through numerical methods. The learning materials include error transmission, roots of nonlinear equations, systems of linear equations, interpolation, numerical derivatives, numerical integration, and numerical differential equations.</p>																														
Study and examination requirements	:	<p>Study and examination requirements:</p> <ul style="list-style-type: none"><li>● Students must attend 15 minutes before the class starts.</li><li>● Students must switch off all electronic devices.</li><li>● Students must inform the lecturer if they will not attend the class due to sickness, etc.</li><li>● Students must submit all class assignments before the deadline.</li><li>● Students must attend the exam to get final grade.</li></ul>																														
Exams and assessment formats	:	<p>Participants are marked based on their performance in theory: Report (50%), Written Exam (50%)</p> <p>Reports measure analytical and writing skills. The Written Exam assesses comprehension and synthesis of all materials discussed during the semester. Altogether, these components account for 100% of the final grade.</p> <p>Students are marked based on their percentage of points obtained and based on the following grade scale:</p> <table><tr><th>Percentage of Achievement</th><th>Grade</th><th>Conversion Value</th></tr><tr><td>85 – 100</td><td>A</td><td>4.00</td></tr><tr><td>80 - &lt;85</td><td>A-</td><td>3.75</td></tr><tr><td>75 - &lt; 80</td><td>B+</td><td>3.5</td></tr><tr><td>70 - &lt; 75</td><td>B</td><td>3.0</td></tr><tr><td>65 - &lt; 70</td><td>B-</td><td>2.75</td></tr><tr><td>60 - &lt; 65</td><td>C+</td><td>2.5</td></tr></table>	Percentage of Achievement	Grade	Conversion Value	85 – 100	A	4.00	80 - <85	A-	3.75	75 - < 80	B+	3.5	70 - < 75	B	3.0	65 - < 70	B-	2.75	60 - < 65	C+	2.5									
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85 – 100	A	4.00																														
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75 - < 80	B+	3.5																														
70 - < 75	B	3.0																														
65 - < 70	B-	2.75																														
60 - < 65	C+	2.5																														

# Bachelor Program in Mathematics

Faculty Mathematics and Natural Sciences  
HASANUDDIN UNIVERSITY



			50 - < 60	C	2.00	
			40 - < 50	D	1.00	
			< 40	E	0.00	
Reading list	:	<ol style="list-style-type: none"><li>1. Abdelwahab Kharab and Ronald B. Guenther, 2002, An Introduction to Numerical Methods: A MATLAB Approach, Chapman and Hall/CRC.</li><li>2. Michael D. Greenberg, 1998, Advanced Engineering Mathematics (2nd Edition), Prentice Hall.</li><li>3. Abbaszadeh, M., Azis, M. I., &amp; Dehghan, M. (2024). A mesh-free method using Pascal polynomials for analyzing space-fractional PDEs in irregular biological geometries. <i>Engineering Analysis with Boundary Elements</i>, 169, 105932. <a href="https://doi.org/10.1016/j.enganabound.2024.105932">https://doi.org/10.1016/j.enganabound.2024.105932</a></li></ol>				
Last revision date	:	July 28 <sup>th</sup> , 2025				