



# UNIVERSITAS GADJAH MADA

Faculty of Mathematics and Natural Sciences

Mathematics Department

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## Doctoral Program in Mathematics

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**MODULE HANDBOOK**  
Doctoral in Mathematics

<b>Module name:</b>	<b>Algorithm and Programming</b>												
<b>Module level, if applicable:</b>	Doctoral Program												
<b>Code, if applicable:</b>	<b>MMM-7503</b>												
<b>Semester(s) in which the module is taught:</b>	First Year												
<b>Person responsible for the module:</b>	Chair of Computational Mathematics Research Group												
<b>Lecturer(s):</b>	Imam Solekhudin, Ph.D.												
<b>Language:</b>	Bahasa Indonesia												
<b>Relation to curriculum:</b>	Doctoral Degree in Mathematics, Compulsory / Elective Course												
<b>Credit points:</b>	3 Semester Credit Unit												
<b>Type of teaching, contact hours:</b>	3x50 minutes lectures, 3x60 minutes structured activities.												
<b>Workload:</b>	<ul style="list-style-type: none"> <li>• 3x50 minutes lectures,</li> <li>• 3x60 minutes structured activities,</li> <li>• 3x60 minutes individual study,</li> <li>• In 16 weeks per semester (including assignments and examinations)</li> </ul>												
<b>Recommended prerequisites:</b>	<b>Sufficient understanding about MATLAB</b>												
<b>Module objectives/intended learning outcomes:</b>	<p>After completing this course, students should have:</p> <p>CO 1: Ability to understand how to write an algorithm and implement the algorithm to MATLAB.</p> <p>CO 2: Ability to create algorithm and write codes to implement the algorithm for problems in selected papers.</p>												
<b>Content:</b>	<i>Introduction to algorithm, Introduction to MATLAB: writing m-files for simple problems, if...else...end, for loop, while loop, writing m-files for problems involving loops and if...else...end, writing m-files for problems from selected papers.</i>												
<b>Study and examination requirements and forms of examination:</b>	<p>The final mark will be weighted as follows:</p> <table border="1"> <thead> <tr> <th>No</th> <th>Assessment methods (components, activities)</th> <th>Weight (percentage)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Assignment 1</td> <td>20 %</td> </tr> <tr> <td>2</td> <td>Assignment 2</td> <td>35 %</td> </tr> <tr> <td>3</td> <td>Assignment 3</td> <td>45 %</td> </tr> </tbody> </table> <p>Final grade will be determined as follows: Grade Criteria The initial cut-off points for grades A, B, C, and D should not be less than 80%, 65%, 50%, and 40%, respectively.</p>	No	Assessment methods (components, activities)	Weight (percentage)	1	Assignment 1	20 %	2	Assignment 2	35 %	3	Assignment 3	45 %
No	Assessment methods (components, activities)	Weight (percentage)											
1	Assignment 1	20 %											
2	Assignment 2	35 %											
3	Assignment 3	45 %											
<b>Media employed:</b>	Board, LCD Projector, Laptop/Computer												
<b>Reading List:</b>	<ol style="list-style-type: none"> <li>1. Cormen, T. H., Leiserson, C. E., Rivest, R. L., and Stein, C., <i>Introduction to Algorithms</i>, MIT Press Ltd., Cambridge, Mass., USA, 2009.</li> <li>2. Kattan, P. I., <i>MATLAB for Beginners : A Gentle Approach</i>, 2008.</li> <li>3. Selected Papers.</li> </ol>												

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### Mapping of The COs and PLOs

	PLO - 1 S3 Mat	PLO - 2 S3 Mat	PLO - 3 S3 Mat	PLO - 4 S3 Mat	PLO - 5 S3 Mat	PLO -6 S3 Mat
CO 1		V	V			V
CO 2		V	V			V

#### Programme Learning Outcomes (PLO) Doctoral Programme in Mathematics

<b>PLO-1</b>	:	<p><b>Attitude:</b></p> <p>Devote to God Almighty, uphold the humanity values, internalize academic values and ethics, responsible in working in the area of expertise independently.</p>
<b>PLO-2</b>	:	<p><b>Knowledge:</b></p> <p>Mastering philosophy of mathematics and one of the fields in mathematics (algebra, analysis, applied mathematics, statistics, computational mathematics, computational statistics).</p>
<b>PLO-3</b>	:	<p><b>Knowledge:</b></p> <p>Able to think logically, analytically, inductively, deductively, and structured; having the ability to manage, lead, and develop research programs independently, and able to communicate the thoughts as well as his work to the scientific community and the general public.</p>
<b>PLO-4</b>	:	<p><b>Skill:</b></p> <p>Creating new concepts and / or new methods (original) in the field of mathematics that are recognized nationally and internationally.</p>
<b>PLO-5</b>	:	<p><b>Skill:</b></p> <p>Able to apply mathematics according to their field of expertise to solve problems including those that require a multidisciplinary, cross-disciplinary, or trans-disciplinary approach.</p>
<b>PLO-6</b>	:	<p><b><i>Life Long Learning:</i></b></p> <p>Having lifelong learning skills and adaptive to the development of science and technology, especially in fields related to Mathematics and its applications.</p>