



UNIVERSITAS GADJAH MADA

Faculty of Mathematics and Natural Sciences

Mathematics Department

Sekip Utara Bulaksumur Yogyakarta 55281 Telp: +62 274 552243 Fax: +62 274 555131 Email: math@ugm.ac.id Website: matematika.fmipa.ugm.ac.id

Doctoral Program in Mathematics

Telp : +62 274 552243

Email : maths3@ugm.ac.id;

Website : <http://s3math.fmipa.ugm.ac.id>

MODULE HANDBOOK

Doctoral in Mathematics

Module name:	Lattice Theory												
Module level, if applicable:	Doctor Program												
Code, if applicable:	MMM 7202												
Semester(s) in which the module is taught:	First Year												
Person responsible for the module:	Chair of Algebra Research Group												
Lecturer(s):	Budi Surodjo												
Language:	Bahasa Indonesia												
Relation to curriculum:	Doctor Degree in Mathematics, Compulsory/Elective Courses												
Credit points:	3 Semester Credit Unit												
Type of teaching, contact hours:	3x50 minutes lectures, 3x50 minutes structured activities.												
Workload:	<ul style="list-style-type: none"> • 3x50 minutes lectures, • 3x50 minutes structured activities, • 3x50 minutes individual study, • In 16 weeks per semester (including mid-term and final examinations). • Total: 144x50 minutes per semester. 												
Requirements according to the examination regulations:	NONE												
Recommended prerequisites:	Before taking this course, students must have a good knowledge of partial ordered sets, algebra structures, and linear algebra												
Module objectives/intended learning outcomes:	<p>After attending this lecture, students will have the knowledge and skills to:</p> <p>CO-1: Demonstrate understanding and ability to work on various types of lattice</p> <p>CO-2: Demonstrate understanding of the importance of lattice properties and being able to use them on various systems.</p> <p>CO-3: Demonstrate their ability to make conjectures on the advance lattice theory and able to analyze it</p> <p>CO-4. Develop sufficient skills, competencies, and thought processes to support further study or work in this field or in fields related to sequence relations</p>												
Content:	Partial ordered sets (poset), mapping between two posets, maximal and minimal element, constructions of posets. Semilattice, lattice, complete lattice. Ascending and descending chain, completeness. Partial ordered algebra: Semigroup, monoid, homomorphism, and algebra structures. Distributive Modular and Boolean Algebra.												
Study and examination requirements and forms of examination:	<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>Final Examination</td> <td>35%</td> </tr> <tr> <td>2</td> <td>Projects/Paper</td> <td>35%</td> </tr> <tr> <td>3</td> <td>Presentation</td> <td>30%</td> </tr> </tbody> </table> <p>Final grade will be determined as follows:</p> <p>Grade Criteria</p> <p>A : $95 \leq \text{final mark} \leq 100$</p> <p>A- : $90 \leq \text{final mark} < 95$</p> <p>A/B : $85 \leq \text{final mark} < 90$</p> <p>B+ : $80 \leq \text{final mark} < 85$</p>	No	Assessment methods (components, activities)	Weight (percentage)	1	Final Examination	35%	2	Projects/Paper	35%	3	Presentation	30%
No	Assessment methods (components, activities)	Weight (percentage)											
1	Final Examination	35%											
2	Projects/Paper	35%											
3	Presentation	30%											

	B : $70 \leq \text{final mark} < 80$ B- : $60 \leq \text{final mark} < 70$ C : $50 \leq \text{final mark} < 60$
Media employed:	White/Black Board, LCD Projector, Laptop/Computer
Reading List:	Referensi: 1. Blyth, T.S., 2005. Lattices and ordered Algebraic Structures, Springer. 2. Roman, Steven, 2008. Lattices and ordered sets, Springer, New York. 3. Alneida, J., 1990. Lattices, Semigroups, and Universal Algebra, Springer, New York.

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	√		√			
CO 2	√		√			
CO 3	√	√	√		√	
CO 4		√	√		√	

Programme Learning Outcomes (PLO) Doctoral Programme in Mathematics

PLO-1	:	Attitude: Devote to God Almighty, uphold the humanity values, internalize academic values and ethics, responsible in working in the area of expertise independently.
PLO-2	:	Knowledge: Mastering philosophy of mathematics and one of the fields in mathematics (algebra, analysis, applied mathematics, statistics, computational mathematics, computational statistics).
PLO-3	:	Knowledge: 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.
PLO-4	:	Skill: Creating new concepts and / or new methods (original) in the field of mathematics that are recognized nationally and internationally.
PLO-5	:	Skill: 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.
PLO-6	:	Life Long Learning: Having lifelong learning skills and adaptive to the development of science and technology, especially in fields related to Mathematics and its applications.