



UNIVERSITAS GADJAH MADA

Faculty of Mathematics and Natural Sciences

Mathematics Department

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Undergraduate Programme in Mathematics

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MODULE HANDBOOK

Module name	Set Theory												
Module level, if applicable	Bachelor												
Code, if applicable	MMM-1204												
Subtitle, if applicable	-												
Courses, if applicable	Set Theory												
Semester(s) in which the module is taught	2 nd (second)												
Person responsible for the module	Chair of the Lab. of Algebra												
Lecturer	Dr. Diah Junia Eksi Palupi, MS												
Language	Bahasa Indonesia												
Relation to curriculum	Compulsory course in the first year (2 nd semester) Bachelor Degree												
Type of teaching, contact hours	2 hours lectures per week, 2 hours structured activities per week, 2 hours private study per week												
Workload	100 minutes lectures, 120 minutes structured activities, 120 hours individual study, 16 weeks per semester (including mid-term and final examinations), 90.67 hours per semester.												
Credit points	2 (two)												
Requirements according to the examination regulations	Students have taken Set Theory course (MMM-1204) and have an examination card where the course is stated on.												
Recommended prerequisites	Students have taken Introduction to Mathematical Logic course (MMM-1208) and have participated in the final examination of the course.												
Module objectives/intended learning outcomes	CO.1. Students are able to identify, infinity and denumerability of sets CO.2. Students are able to determine, cardinality of sets and to operate cardinal numbers. CO.3. Students are able to prove Bernstein Theorem and Cantor Theorem CO.4. Students are able to apply the infinity set & the correspondence concepts for problem solving for mathematical courses.												
Content	Equipotence of two sets, Denumerable & non Denumerable set and their properties. Infinity sets; Inductive & non Inductive set, cardinality, Aleph Null, Aleph, Aritmatica of cardinality. Construction of Number System, Bernstein Theorem & Cantor Theorem.												
Study and examination requirements and forms of examination	The final mark will be weighted as follows: <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>40%</td> </tr> <tr> <td>2</td> <td>Mid-Term Examination</td> <td>30%</td> </tr> <tr> <td>3</td> <td>Class Activities: Quiz, Homework, etc.</td> <td>30%</td> </tr> </tbody> </table> The initial cut-off points for grades A, B, C, and D should not be less than 80%, 70%, 50%, and 40%, respectively.	No	Assessment methods (components, activities)	Weight (percentage)	1	Final Examination	40%	2	Mid-Term Examination	30%	3	Class Activities: Quiz, Homework, etc.	30%
No	Assessment methods (components, activities)	Weight (percentage)											
1	Final Examination	40%											
2	Mid-Term Examination	30%											
3	Class Activities: Quiz, Homework, etc.	30%											
Media employed	Projector, whiteboard, laptop.												
Reading List	<ol style="list-style-type: none"> Charles Pinter, 2014, Set Theory, Dover Publications Inc. Nancy Rodgers, 2008, Learning to Reason: An Introduction to Logic, Sets and Relations, Wiley-Interscience Dave Witte Morris and Joy Morris, 2006-2012, <i>Proofs and Concepts the fundamentals of abstract mathematics</i>, University of Lethbridge (http://people.uleth.ca/~dave.morris/books/proofs+concepts.pdf) Keith Devlin, Sets, Functions and Logic: An Introduction to Abstract Mathematics, 2003, Chapman and Hall/CRC Ash, R.B., 1998, <i>A primer of abstract mathematics</i>. Mathematical Association of America, Washington, DC 												

	<p>6. Morash, R.P., 1987, <i>Bridge to Abstract Mathematics: Mathematical Proof and Structures</i> The Random House/Birkhauser Mathematics http://wanda.uef.fi/matematiikka/Oppimateriaaleja/Morash_Bridge_to_Abstract_Mathematics.pdf</p> <p>7. Soehakso, RMJT, 1985, <i>Pengantar Matematika Modern</i>, FMIPA UGM Jogjakarta</p> <p>8. Guram Bezhanishvili and Eachan Landreth https://www.maa.org/sites/default/files/images/upload_library/46/Pengelley_projects/Project-5/set_theory_project.pdf</p> <p>9. Kenneth KUNEN, 1980, SET THEORY: <i>An Introduction to Independence Proofs</i>, ELSEVIER SCIENCE PUBLISHERS B.V. https://logic.wikischolars.columbia.edu/file/view/Kunen,+K.+(1980).+Set+Theory.pdf/205671054/Kunen,%20K.%20(1980).%20Set%20Theory.pdf</p> <p>10. Abraham A. Fraenkel, 1966, <i>Abstract Set Theory</i>, Addison Wesley.</p>
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PLO and CO Mapping

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9
CO 1		v							
CO 2		v	v						
CO 3			v						
CO 4			v				v		