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: http://math.fmipa.ugm.ac.id

Undergraduate Programme in Mathematics
Telp : +62 274 552243
Email : maths1@ugm.ac.id; kaprodi-s1-matematika.mipa@ugm.ac.id
sekprodi-s1-matematika.mipa@ugm.ac.id
Website : http://s1math.fmipa.ugm.ac.id/

MODULE HANDBOOK

Module name	Introduction to Mathematical Logic
Module level, if applicable	Bachelor
Code, if applicable	MMM-1201
Subtitle, if applicable	-
Courses, if applicable	Introduction to Mathematical Logic
Semester(s) in which the module is taught	1st (first)
Person responsible for the module	Chair of the Lab. of Algebra
Lecturer(s)	Dr. Budi Surodjo, M.Si. Dr. Ari Suparwanto, M.Si.
Language	Bahasa Indonesia
Relation to curriculum	Compulsory course in the first year (1st semester) Bachelor Degree
Type of teaching, contact hours	150 minutes lectures and 180 minutes structured activities per week
Workload	Total workload is 136 hours per semester, which consists of 150 minutes lectures per week for 14 weeks, 180 minutes structured activities per week, 180 minutes individual study per week, in total is 16 weeks per semester, including mid exam and final exam.
Credit points	3 (three)
Requirements according to the examination regulations	Students have taken Introduction to Mathematical Logic course (MMM-1201) and have an examination card where the course is stated on.
Recommended prerequisites	-
Module objectives/intended learning outcomes	After completed this course students should have: CO.1. Ability to recognize tautology and proving methods CO.2. Ability to apply the proving methods to prove simple mathematical problems CO.3. Ability to apply any problems in other fields using the proving methods. CO.4. Ability to recognize concepts of sets and functions. CO.5. Ability to prove any simple mathematical properties due to set and functions
Content	Universe of discourse; Declarative sentences; Negation, conjunction, disjunction, implication, biimplication; Tables of truth, Tautology and Proving methods: direct and indirect proofs, mathematical induction; Constanta and variable; Universal quantifier and existensial quantifier; Writing using quantifiers; Set, Operations on Set and its properties; Relations and partitions; Functions : Injective, Surjective, and Bijective, Inverse Functions, Characteristic and restriction. Special sets : power set and Cartesian product.
Study and examination requirements and forms of examination	The final mark will be weighted as follows: No — Assessment methods (components, activities) — Weight (percentage) 1 — Final Examination — 40% 2 — Mid-Term Examination — 30% 3 — Class Activities: Quiz, Homework, etc. — 30% The initial cut-off points for grades A, B, C, and D should not be less than 80%, 70%, 50%, and 40%, respectively.
Media employed	Projector, board, laptop, e-learning via http://elisa.ugm.ac.id

Reading List	1. Alexandra Bellow, Cristian S Calude, Tudor Zamfirescu, 2018, Mathamatics Almost Everywhere, World Scientific. 2. Nancy Rodgers, 2008, Learning to Reason: An Introduction to Logic, Sets and Relations, Wiley-Interscience 3. Dave Witte Morris and Joy Morris, 2006-2012, *Proofs and Concepts the fundamentals of abstract mathematics*, University of Lethbridge (http://people.uleth.ca/~dave.morris/books/proofs+concepts.pdf) 4. Budi Surodjo dkk, 2003, Diktat Kuliah/RPKPS, Pengantar Logika Matematika dan Himpunan, FMIPA UGM, Jogjakarta 5. Keith Devlin, 2003, Sets, Functions and Logic: An Introduction to Abstract Mathematics, Chapman and Hall/CRC 6. Robert B. Ash, 1998, *A primer of abstract mathematics. Mathematical Association of America*, Washington, DC 7. Ronald P. Morash, 1987, *Bridge to Abstract Mathematics: Mathematical Proof and Structures*, The Random House/Birkhaoser Mathematics (http://wanda.uef.fi/matematiikka/Oppimateriaaleja/Morash_Bridge_to_Abstract_Mathematics.pdf) 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 9. Soehakso, RMJT, 1985, *Pengantar Matematika Modern*, FMIPA UGM Jogjakarta 10. Kenneth KUNEN (1980), SET THEORY: *An Introduction to Independence Proofs*, 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

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		v				
CO 4					v				
CO 5					v		v		