UNIVERSITAS GADJAH MADA
Faculty of Mathematics and Natural Sciences
Department of Mathematics
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

Doctor in Mathematics

MODULE HANDBOOK

Telp : +62 274 552243
Email : maths3@ugm.ac.id; kaprodi-s3-matematika.mipa@ugm.ac.id
Website : http://s3math.fmipa.ugm.ac.id/

Module designation	Advanced Applied Linear Algebra : Selected Topics in Algebra (related to linear algebra)
Code, if applicable	MMM 7208
Subtitle, if applicable	-
Course, if applicable	Advanced Applied Linear Algebra : Selected Topics in Algebra (related to linear algebra)
Semester(s) in which the module is taught	1st or 2nd Semester
Person responsible for the module	Head of Algebra Research Group
Language	Bahasa Indonesia
Relation to curriculum	Elective course
Teaching methods	Lecture, project.
Workload (incl. contact hours, self-study hours)	Total workload is 232 hours per semester, which consists of 50 minutes lectures per week, 120 minutes structured activities per week, 120 minutes individual study per week, in total is 16 weeks per semester, including mid exam and final exam.
Credit points in Credit Units	3
Required and recommended prerequisites for joining the module	Students should have prior knowledge such as group theory, ring theory and linear algebra.

Module objectives/intended learning outcomes	Upon successful completion, students are able to CO1 : analyze concepts, philosophy, definitions and important properties of advanced linear algebra related to his/her research; CO2 : prove important properties of advanced linear algebra related to his/her research; CO3 : make conjectures to further subjects related to his/her research; CO4 : expand or improve special prior knowledge related to his/her research.
Content	Topics and syllabus depend on the research.
Examination forms	Oral presentation, essay.
Study and examination requirements	The final mark will be computed from a proportional weight of assignments, mid examination and final examination. The final mark will be weighted as follows: Weight (percentage) 1 Final Examination 20 - 30% 2 Mid-Term Examination 20 - 30% 3 Class Activities: Quiz, Homework, etc. 50 - 55% Minimum final mark to pass : B
Media employed	Whiteboard, screen, laptop.
Reading list	Papers and references related to the research.

CO-PLO Mapping

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6
CO 1	v	v	v		v	v
CO 2	v	v	v		v	v
CO 3	v	v	v		v	v
CO 4	v	v	v		v	v

Compilation Date : January 31st 2024

Modified Date : February 10th 2024

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MODULE HANDBOOK

Module Designation	Advanced Applied Linear Algebra : Selected Topics in Algebra (related to linear algebra)
Code, if applicable	MMM-7208
Subtitle, if applicable	Advanced Linear Algebra
Semester(s) in which the module is taught	1st or 2nd Semester
Person responsible for the module	Chair of the Algebra Laboratory
Language	Bahasa Indonesia
Relation to curriculum	Compulsory for Master of Mathematics
Teaching methods	lecture, case based, project, essay
Workload (incl. contact hours, self-study hours)	Total workload is 232 hours per semester, which consists of 50 minutes lectures per week, 120 minutes structured activities per week, 120 minutes individual study per week, in total is 16 weeks per semester, including mid exam and final exam.
Credit points in credit units	3
Required and recommended prerequisites for joining the module	1. Students should be familiar to elementary logic and basic mathematical notions, such as sets, maps, equivalence relations, etc. 2. Students should have knowledge of basic concepts of matrix algebra, such as vectors, matrices, and how to compute with them;
Module objectives/intended learning outcomes	On successful completion of this course, students should be able to: CO 1: analyze and apply fundamental concepts of advanced linear algebra, CO 2: prove some properties of advanced linear algebra CO 3: to make some conjectures on advanced linear algebra

Content	Advanced linear algebra
Examination forms	written task, oral presentation, essay
Study and examination requirements	The final mark will be weighted as follows: No Assessment methods (components, activities) Weight (percentage) 1. Final Examination 25-40% 2. Mid-Term Examination 25-40% 3. Quiz/Presentation 20-30% 4. Homework 10-20% Minimum final mark to pass : 70 (grade B)
Media employed	LMS eLOK UGM, LCD projector
Reading list	[1] Roman, S, 2005, Advanced linear algebra, 2nd ed., Grad. Text in Math. 135, Springer-Verlag. [2] Weintraub, S.H., 2011. A Guide to Advanced Linear Algebra (No. 44). MAA. [3] Lax, P.D., 2007, Linear algebra and its applications, 2nd ed., John Wiley & Sons. [4] Curtis, M.L., 2012. Abstract linear algebra. Springer Science & Business Media. [5] Cooperstein, B., 2010. Advanced linear algebra. CRC Press.

CO-PLO Mapping

	PLO 1	**PLO 2**	**PLO 3**	**PLO 4**	**PLO 5**	**PLO 6**
CO 1		v	v	v		v
CO 2		v	v	v		v
CO 3	v	v	v	v		v

Compilation Date : October 10, 2023

Modified Date : February 24, 2024

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Module designation	Advanced Applied Linear Algebra: Representation Theory
Code, if applicable	MMM 7208
Subtitle, if applicable	Representation Theory
Semester(s) in which the module is taught	1st or 2nd Semester
Person responsible for the module	Head of Algebra Research Group
Language	Bahasa Indonesia
Relation to curriculum	Elective course
Teaching methods	Lecture, project.
Workload (incl. contact hours, self-study hours)	Total workload is 232 hours per semester, which consists of 50 minutes lectures per week, 120 minutes structured activities per week, 120 minutes individual study per week, in total is 16 weeks per semester, including mid exam and final exam.
Credit points in Credit Units	3
Required and recommended prerequisites for joining the module	Students should have prior knowledge such as group theory, ring theory and linear algebra.

Module objectives/intended learning outcomes	Upon successful completion, students • CO 1: understand the definitions, theorems and techniques of representation theory.; Representation of finite groups (Definition and examples, Equivalence, invariant subspace, subrepresentations) • CO 2: are able to construct Irreducible Representation (Direct Sum, Maschke's Theorem) • CO-3: are able to construct character tables of finite groups. Characters of Representation (Definition, orthogonal relation of character, schur's lemma, Schur orthogonality relation). • CO-4: are able to construct Class Function, Regular Representation. • CO-5: are able to construct simple proofs similar to those encountered in the module and have the ability to pursue further studies in this and related areas.
Content	Topics and syllabus depend on the research.
Examination forms	Oral presentation, essay.
Study and examination requirements	The final mark will be computed from a proportional weight of assignments, mid examination and final examination. The final mark will be weighted as follows: Weight (percentage) 1 Final Examination 20 - 30% 2 Mid-Term Examination 20 - 30% 3 Class Activities: Quiz, Homework, etc. 50 - 55% Minimum final mark to pass : B
Media employed	Whiteboard, screen, laptop.
Reading list	Papers and references related to the research.

CO-PLO Mapping

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6
CO 1	v	v	v		v	v
CO 2	v	v	v		v	v
CO 3	v	v	v		v	v
CO 4	v	v	v		v	v
CO 5	v	v	v		v	v

Compilation Date : September 13th 2023

Modified Date : January 31th 2024

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Module designation	Advanced Applied Linear Algebra : Selected Topics in Algebra (related to linear algebra)
Code, if applicable	MMM 7208
Subtitle, if applicable	Capita Selecta
Semester(s) in which the module is taught	1st or 2nd Semester
Person responsible for the module	Head of Algebra Research Group
Language	Bahasa Indonesia
Relation to curriculum	Elective course
Teaching methods	Lecture, project.
Workload (incl. contact hours, self-study hours)	Total workload is 232 hours per semester, which consists of 50 minutes lectures per week, 120 minutes structured activities per week, 120 minutes individual study per week, in total is 16 weeks per semester, including mid exam and final exam.
Credit points in Credit Units	3
Required and recommended prerequisites for joining the module	Students should have prior knowledge such as group theory, ring theory and linear algebra.
Module objectives/intended learning outcomes	Upon successful completion, students are able to CO1 : analyze concepts, philosophy, definitions and important properties of advanced linear algebra related to his/her research; CO2 : prove important properties of advanced linear algebra related to his/her research; CO3 : make conjectures to further subjects related to his/her research; CO4 : expand or improve special prior knowledge related to his/her research.
Content	Topics and syllabus depend on the research.

Examination forms	Oral presentation, essay.
Study and examination requirements	The final mark will be computed from a proportional weight of assignments, mid examination and final examination. The final mark will be weighted as follows: Weight (percentage) 1 Final Examination 20 - 30% 2 Mid-Term Examination 20 - 30% 3 Class Activities: Quiz, Homework, etc. 50 - 55% Minimum final mark to pass : B
Media employed	Whiteboard, screen, laptop.
Reading list	Papers and references related to the research.

CO-PLO Mapping

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6
CO 1	v	v	v		v	v
CO 2	v	v	v		v	v
CO 3	v	v	v		v	v
CO 4	v	v	v		v	v

Compilation Date : January 31st 2024

Modified Date : February 10th 2024