	Module Description/Course Syllabi
	Study Programme: Master of Mathematics Faculty of Mathematics and Natural Sciences Universitas Andalas

1. *Course number and name*

MAT82212 Topic in Algebra 2

2. *Credits and contact hours/Number of ECTS credits allocated*

3 sks / 4,53 ECTS

3. *Instructors and course coordinator*

1. Dr. Yanita; 2. Prof. Dr. Admi Nazra

4. *Text book, title, author, and year*

Related literature (based on topic)

5. *Recommended reading and other learning resources/tools*

Related literature (based on topic)

6. *Specific course information*

A. Brief description of the content of the course (catalog description)

This course discusses theories in algebra (linear algebra and abstract algebra). Students do simple research on one of the topics given in the study material.

B. Prerequisites or co-requisites

-

C. Indicate whether a required or elective course in the program
-

D. Level of course unit (according to EQF: first cycle Bachelor, second cycle Master)
Second Cycle Master

E. Year of study when the course unit is delivered (if applicable)
2 Year

F. Semester when the course unit is delivered
Even Semester

G. Mode of delivery (face-to-face, distance learning)
Face to face (a combination of Teacher-Centered Learning and Student-Centered Learning)

7. Intended Learning Outcomes
ILO-1 Possesses good ethics and integrity PI-1 Possess academic ethics. PI-2 Demonstrate academic integrity.
ILO-2 Mastering mathematical concepts and applications (real analysis, advanced linear algebra, and statistics) in solving complex mathematical problems

PI-1 Able to explain mathematical concepts (Real Analysis, Advanced Linear Algebra, and Statistics).
PI-2 Able to identify complex mathematical problems.
PI-3 Able to solve complex mathematical problems.

ILO-3 Comprehensive mastery of one or several theories for development in the fields of analysis, algebra, applied mathematics, statistics and combinatorial mathematics.
PI-1 Able to identify theories used in related mathematical problems.
PI-2 Able to apply theories for advancement in related fields (advanced theory).
PI-3 Able to use advanced theory to solve related mathematical problems.

ILO-4 Mastering scientific techniques and developing them in solving research problems through multidisciplinary or interdisciplinary approaches
PI-1 Able to apply mathematical techniques in research problem-solving.
PI-2 Able to analyse research problems.
PI-3 Able to formulate theorems/models and prove their validity.
PI-4 Able to use various mathematical software to solve complex mathematical problems

ILP-5 Able to work and conduct research in the field of mathematics and related fields of science by developing the latest issues independently or collaboratively and communicating them academically
PI-1 Capable of formally and correctly proving mathematical statements.
PI-2 Able to employ relevant techniques for conducting research.
PI-3 Capable of communicating research findings in an academic manner.

ILO-6 Able to be actively involved in lifelong learning and sustainability
PI-1 Able to independently expand and deepen learning based on acquired knowledge.
PI-2 Able to expand and deepen interdisciplinary competencies based on acquired knowledge.
PI-3 Able to understand and apply the latest developments in mathematical theory.

8. *Course Learning Outcomes*

1. Able to determine the research topic with one of the advanced mathematics materials or a generalization of one of the mathematics materials and determine related literature. (**ILO-1**: PI-1, PI-2, **ILO-2**, PI-1, PI-2; **ILO-3**: PI-1, PI-2, **ILO-5**: PI-2, **ILO-6**: PI-1, PI-2, PI-3)

2. Able to write and present the simple mathematical research topics or generalize one of the mathematical materials based on one of given topic in the form of a scientific proposal. (**ILO-1**: PI-1, PI-2, **ILO-2**:PI-1, PI-2; **ILO-3**: PI-1, PI-2, **ILO-4**: PI-1, PI-2, PI-3, **ILO-5**: PI-1, PI-2, **ILO-6**: PI-1, PI-2)

3.	Able to write and present the basic supporting theories of research topics with advanced mathematics material or generalize one of the mathematical materials used as a research topic with scientific writing. (**ILO-1**: PI-1, PI-2, **ILO-2**:PI-1, PI-2; **ILO-3**: PI-1, PI-2, **ILO-4**: PI-1, PI-2, PI-3, **ILO-5**: PI-1, PI-2, **ILO-6**: PI-1, PI-2, PI-3)
4.	Able to solve problems related to research topics using mathematical methods and scientific writing and present the article (**ILO-1**: PI-1, PI-2, **ILO-2**:PI-1, PI-2, PI-3; **ILO-3**: PI-1, PI-2, **ILO-4**: PI-1, PI-2, PI-3, PI-4; **ILO-5**: PI-1, PI-2, PI-3; **ILO-6**: PI-1, PI-2, PI-3)

9. *Brief list of topics to be covered*

This course discusses theories in algebra (linear algebra and abstract algebra). Students do simple research on one of the topics given in the study material.

10. *Learning and teaching methods*

Directed Learning, Student Center Learning

11. *Language of instruction*

Bahasa Indonesia and English

12. *Assessment methods and criteria*

Summative Assessment :
 1. Make proposal : 10%
 2. Presentation the proposal : 10%
 3. Make article: 40%
 4. Presentation the article : 40%
Formative Assessment:

SEMESTER STUDY PLAN

TOPIC IN ALGEBRA 2

(ELECTIVE COURSE)

DEPARTMENT OF MATHEMATICS AND DATA SCIENCE

FACULTY OF MATHEMATICS AND NATURAL SCIENCE

UNIVERSITAS ANDALAS

2024

SEMESTER STUDY PLAN (SSP)
MASTER OF MATHEMATICS PROGRAM
FACULTY OF MATHEMATICS AND NATURAL SCIENCE
UNIVERSITAS ANDALAS

Course Name	Code	Course URL *i-Learn*	Credits	Semester	Date
Topic in Algebra 2	MAT81212	https://sci.ilearn.unand.ac.id	3	3	May 14th, 2024

Person in Charge	Create by	Head of Research Group	Head of Master Program
	Dr. Yanita	Prof. Dr. Ferra Yanuar	Prof. Dr. Ferra Yanuar

Intended Learning Outcomes (ILO) and Course Learning Outcomes (ILO)	Intended Learning Outcomes	
	ILO-1	Possesses good ethics and integrity PI-1 Possess academic ethics. PI-2 Demonstrate academic integrity.
	ILO-2	Mastering mathematical concepts and applications (real analysis, advanced linear algebra, and statistics) in solving complex mathematical problems PI-1 Able to explain mathematical concepts (Real Analysis, Advanced Linear Algebra, and Statistics). PI-2 Able to identify complex mathematical problems. PI-3 Able to solve complex mathematical problems.
	ILO-3	Comprehensive mastery of one or several theories for development in the fields of analysis, algebra, applied mathematics, statistics and combinatorial mathematics. PI-1 Able to identify theories used in related mathematical problems. PI-2 Able to apply theories for advancement in related fields (advanced theory). PI-3 Able to use advanced theory to solve related mathematical problems.
	ILO-4	Mastering scientific techniques and developing them in solving research problems through multidisciplinary or interdisciplinary approaches PI-1 Able to apply mathematical techniques in research problem-solving. PI-2 Able to analyse research problems. PI-3 Able to formulate theorems/models and prove their validity. PI-4 Able to use various mathematical software to solve complex mathematical problems

	ILO-5	Able to work and conduct research in the field of mathematics and related fields of science by developing the latest issues independently or collaboratively and communicating them academically PI-1 Capable of formally and correctly proving mathematical statements. PI-2 Able to employ relevant techniques for conducting research. PI-3 Capable of communicating research findings in an academic manner.
	ILO-6	Able to be actively involved in lifelong learning and sustainability PI-1 Able to independently expand and deepen learning based on acquired knowledge. PI-2 Able to expand and deepen interdisciplinary competencies based on acquired knowledge. PI-3 Able to understand and apply the latest developments in mathematical theory.
	Course Learning Outcomes	
	1	Able to determine the research topic with one of the advanced mathematics materials or a generalization of one of the mathematics materials and determine related literature. (**ILO-1**: PI-1, PI-2, **ILO-2**, PI-1, PI-2; **ILO-3**: PI-1, PI-2, **ILO-5**: PI-2, **ILO-6**: PI-1, PI-2, PI-3)
	2	Able to write and present the simple mathematical research topics or generalize one of the mathematical materials based on one of given topic in the form of a scientific proposal. (**ILO-1**: PI-1, PI-2, **ILO-2**:PI-1, PI-2; **ILO-3**: PI-1, PI-2, **ILO-4**: PI-1, PI-2, PI-3, **ILO-5**: PI-1, PI-2, **ILO-6**: PI-1, PI-2)
	3	Able to write and present the basic supporting theories of research topics with advanced mathematics material or generalize one of the mathematical materials used as a research topic with scientific writing. (**ILO-1**: PI-1, PI-2, **ILO-2**:PI-1, PI-2; **ILO-3**: PI-1, PI-2, **ILO-4**: PI-1, PI-2, PI-3, **ILO-5**: PI-1, PI-2, **ILO-6**: PI-1, PI-2, PI-3)
	4	Able to solve problems related to research topics using mathematical methods and scientific writing and present the article (**ILO-1**: PI-1, PI-2, **ILO-2**:PI-1, PI-2, PI-3; **ILO-3**: PI-1, PI-2, **ILO-4**: PI-1, PI-2, PI-3, PI-4; **ILO-5**: PI-1, PI-2, PI-3; **ILO-6**: PI-1, PI-2, PI-3)
Brief Description		This course discusses theories in algebra (linear algebra and abstract algebra). Students do simple research on one of the topics given in the study material. The learning method in this course is face-to-face (a combination of Teacher-Centered Learning and Student-Centered Learning)

Study material	Materi tergantung pada topic yang ada pada bidang riset aljabar, yaitu 1. Matrix theory 2. Group theory 3. Ring theory 4. Combinatorial group theory
References	Main Related Literature
Learning Media	**Software :** **Hardware :**
	- -
Team Teaching	1. Dr. Yanita 2. Prof. Dr. Admi Nazra
Assessment	1. Make proposal 2. Presentation the proposal 3. Make article 4. Presentation the article
Required courses	Advanced Linear Algebra, Matrix Algebra (optional), Combinatorial Group Theory (optional)

Weakly Plan Study

Week/ Meet (1)	Course Outcomes (2)	Indicator (3)	Assessment (4)	Activities/Forms of Learning [Time estimated]					Media (9)	Subject, references (10)	Weight (11)
				Synchronus*		Asynchronus**					
				Face to face Offline (5)	Face to face Online (6)	Individual (7)	Colaboration (8)				
1, 2	CLO-1 Able to determine the final assignment research topic with one of the advanced mathematics materials or a generaliza-tion of one of the mathematics materials and determine related literature. (**ILO-1**: PI-1, PI-2, **ILO-2**:PI-1, PI-2; **ILO-3**: PI-1, PI-2, **ILO-5**: PI-2, **ILO-6**: PI-1, PI-2, PI-3)	• Accuracy in determining research topics • Accuracy in selecting literature related to the research topic	Non test: • Make literature review • Presentation the literature review Test : -	Discussion		Students read and study material related to the research topic that will be used as a thesis.			Related Literature	10%

3, 4, 5	CLO-2 Able to write and present the simple mathematical research topics or generalize one of the mathematical materials based on one of given topic in the form of a scientific proposal. (**ILO-1**: PI-1, PI-2, **ILO-2**:PI-1, PI-2; **ILO-3**: PI-1, PI-2, **ILO-4**: PI-1, PI-2, PI-3, **ILO-5**: PI-1, PI-2, **ILO-6**: PI-1, PI-2)	• Accuracy in making research proposals based on scientific principles • Accuracy in responding to improvements proposed by lecturer	Non test : Make research proposal Test : Presentation the proposal	Discussion and presentation		• Student make a research proposal • Student respond to improvements provided by the supervisor		•	Related Literature	10%
6,7,8,9	CLO-3 Able to write and present the basic supporting theories of research topics with mathematics material or	• Accuracy in writing theories related to research • Accuracy in responding to suggestions/imp rovements	Non test : Make article Test : Presentation	Discussion and presentation		Students work on their article: Make abstract, introduction or prelimiere		•	Related Literature	40%

	generalize one of the mathematical materials used as a research topic with scientific writing. (**ILO-1**: PI-1, PI-2, **ILO-2**:PI-1, PI-2; **ILO-3**: PI-1, PI-2, **ILO-4**: PI-1, PI-2, PI-3, **ILO-5**: PI-1, PI-2, **ILO-6**: PI-1, PI-2, PI-3)	suggested by lecturer								
10, 11, 12, 13, 14, 15,16	CLO-4 Able to solve problems related to research topics using mathematical methods and scientific writing. (**ILO-1**: PI-1, PI-2, **ILO-2**:PI-1, PI-2, PI-3; **ILO-3**: PI-1, PI-2, **ILO-4**: PI-1, PI-2, PI-3, PI-4; **ILO-5**: PI-1, PI-2, PI-3;	• Accuracy in writing problem formulations in research • Accuracy in writing research problem-solving methods • Accuracy in answering/solving research problems • Accuracy in writing	Non test : Make article Test Presentation the article	Discussion and presentation		• Students work on their article: make basic Theory, Result and Conclusion. • Student do assignment: Presentation the article			Related Literature	40%

| | ILO-6: PI-1, PI-2, PI-3) | research conclusions
• Accuracy in responding to suggestions/improvements suggested by the supervisor | | | | | | | |

1 credit = 50 minutes face-to-face meeting, 60 minutes structured study, 60 minutes independent study

Matrix ILO dan CLO

CLO	ILO 1		ILO 2			ILO 3			ILO 4				ILO 5			ILO 6		
	PI 1	PI 2	PI 1	PI 2	PI 3	PI 1	PI 2	PI 3	PI 1	PI 2	PI 3	PI 4	PI 1	PI 2	PI 3	PI 1	PI 2	PI 3
1	✓	✓	✓	✓		✓	✓							✓		✓	✓	
2	✓	✓	✓	✓		✓	✓		✓	✓	✓		✓	✓		✓	✓	
3	✓	✓	✓	✓		✓	✓		✓	✓	✓		✓	✓		✓	✓	✓
4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Indicators, Criteria, and Assessment Weights

1. Assessment weight for each Assessment

No	Assessment	Weight (%)
1	Proposal	10
2	Presentation the proposal	10
3	Article	40
4	Presentation the article	40
TOTAL		**100**

2. Assessment weight for Intended Learning Outcome
   - CLO-1: 10 %
   - CLO-2: 10 %
   - CLO-3: 40 %
   - CLO-4: 40 %

Assessment Plan Table

No.	Course Learning Outcomes	Assessment				Weight (%)
		Proposal (%)	Presentation the article (%)	Article (%)	Presentation the article (%)	
1	Able to determine the research topic with one of the advanced mathematics materials or a generalization of one of the mathematics materials and determine related literature. (**ILO-1**: PI-1, PI-2, **ILO-2**, PI-1, PI-2; **ILO-3**: PI-1, PI-2, **ILO-5**: PI-2, **ILO-6**: PI-1, PI-2, PI-3)	10				**10**
2	Able to write and present the simple mathematical research topics or generalize one of the mathematical		10			**10**

	materials based on one of given topic in the form of a scientific proposal. (**ILO-1**: PI-1, PI-2, **ILO-2**:PI-1, PI-2; **ILO-3**: PI-1, PI-2, **ILO-4**: PI-1, PI-2, PI-3, **ILO-5**: PI-1, PI-2, **ILO-6**: PI-1, PI-2)					
3	Able to write and present the basic supporting theories of research topics with advanced mathematics material or generalize one of the mathematical materials used as a research topic with scientific writing. (**ILO-1**: PI-1, PI-2, **ILO-2**:PI-1, PI-2; **ILO-3**: PI-1, PI-2, **ILO-4**: PI-1, PI-2, PI-3, **ILO-5**: PI-1, PI-2, **ILO-6**: PI-1, PI-2, PI-3)			40		**40**
4	Able to solve problems related to research topics using mathematical methods and scientific writing and present the article (**ILO-1**: PI-1, PI-2, **ILO-2**:PI-1, PI-2, PI-3; **ILO-3**: PI-1, PI-2, **ILO-4**: PI-1, PI-2, PI-3, PI-4; **ILO-5**: PI-1, PI-2, PI-3; **ILO-6**: PI-1, PI-2, PI-3)				40	**40**
Total		**10**	**10**	**40**	**40**	**100**