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 An ability to explain mathematical concepts (Real Analysis, Advanced Linear Algebra, and Statistics). PI-2 An ability to identify complex mathematical problems. PI-3 An ability 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 An ability to identify theories used in related mathematical problems. PI-2 An ability to apply theories for advancement in related fields (advanced theory). PI-3 An ability 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 An ability to apply mathematical techniques in research problem-solving.

		PI-2 An ability to analyze research problems. PI-3 An ability to formulate theorems/models and prove their validity. PI-4 An ability to use various mathematical software to solve complex mathematical problems
	ILO-5	An ability 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 An ability to employ relevant techniques for conducting research. PI-3 Capable of communicating research findings in an academic manner.
	ILO-6	An ability to be actively involved in lifelong learning and sustainability PI-1 An ability to independently expand and deepen learning based on acquired knowledge. PI-2 An ability to expand and deepen interdisciplinary competencies based on acquired knowledge. PI-3 An ability to understand and apply the latest developments in mathematical theory.
	Course Learning Outcomes	
	1	An ability 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	An ability 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	An ability 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	An ability 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)

<table>
<tr><td>Brief Description</td><td colspan="2">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)</td></tr>
<tr><td>Study material</td><td colspan="2">Materi tergantung pada topic yang ada pada bidang riset aljabar, yaitu
1. Matrix theory
2. Group theory
3. Ring theory
4. Combinatorial group theory</td></tr>
<tr><td>References</td><td colspan="2">Main
Related Literature</td></tr>
<tr><td>Learning Media</td><td>Software :</td><td>Hardware :</td></tr>
<tr><td></td><td>-</td><td>-</td></tr>
<tr><td>Team Teaching</td><td colspan="2">1. Dr. Yanita
2. Prof. Dr. Admi Nazra</td></tr>
<tr><td>Assessment</td><td colspan="2">1. Make proposal
2. Presentation the proposal
3. Make article
4. Presentation the article</td></tr>
<tr><td>Required courses</td><td colspan="2">Advanced Linear Algebra, Matrix Algebra (optional), Combinatorial Group Theory (optional)</td></tr>
<tr><td>Academic Norms</td><td colspan="2">https://akademik.unand.ac.id/images/2022-03-30%20Peraturan%20Rektor%20Nomor%207%20Tahun%202022%20Penyelenggaraan%20Pendidikan-khusus%20Bab%20II.pdf</td></tr>
</table>

Weakly Plan Study

Week / Meet (1)	Course Outcomes (2)	Indicator (3)	Assessment (4)	Activities/Forms of Learning [Time estimated]					Subject, references (10)	Weight (11)
				Synchronous*		Asynchronous**		Media (9)		
				Face to face Offline (5)	Face to face Online (6)	Individual (7)	Collaboration (8)			
1, 2	CLO-1 An ability 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 on the literature review Test : -	Discussion [2 x 3 x 50 minutes]		Students read and study material related to the research topic that will be used as a thesis. [2 x 3 x 120 minutes]			Related Literature	10%

3, 4, 5	CLO-2 An ability 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 [3 x 3 x 50 minutes]		• Student make a research proposal • Student respond to improvements provided by the supervisor [3 x 3 x 120 minutes]		•	Related Literature	10%
6,7,8,9	CLO-3 An ability 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/improvements suggested by lecturer	Non test : Make article Test : Presentation	Discussion and presentation [4 x 3 x 50 minutes]		Students work on their article: Make abstract, introduction or prelimiere [4 x 3 x 120 minutes]		•	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)									
10, 11, 12, 13, 14, 15,16	CLO-4 An ability 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; **ILO-6**: 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 [7 x 3 x 50 minutes]		• Students work on their article: make basic Theory, Result and Conclusion. • Student do assignment: Presentation the article [7 x 3 x 120 minutes]			Related Literature	40%

		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

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	An ability 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	An ability 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)		10			**10**
3	An ability 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	An ability 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**

Matrix ILO dan CLO

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