Module Description/Course Syllabi

Study Programme: Mathematics (Master Degree)
Faculty of Mathematics and Natural Sciences
Universitas Andalas

1. *Course number and name*

MAT81103 Thesis 1

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

3/4,53 ECTS

3. *Instructors and course coordinator*

Promotor and Co-promotor

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

- Appropriate journal/book
- http://matematika.fmipa.unand.ac.id/magister/download-category/pedoman/

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

Appropriate journal/book

6. *Specific course information*

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

This course discuse the topic research for each student, which involves the following components: 1. Abstract: An abstract is a concise summary of the thesis, usually limited to around 200 words. It provides an overview of the research conducted and its main findings. 2. Introduction: The introduction sets the stage for the thesis, outlining the research problem, its significance, and the research objectives. It often includes a hook to engage the reader. 3. Literature Review: This section reviews relevant academic literature to establish the context and theoretical framework for the research. 4. Methodology: The methodology details the research methods and techniques employed to collect and analyze data. 5. Results and Discussion: The results section presents the findings of the research based on the data analysis. Discussion: In this part, the results are interpreted and discussed in the context of the research question and relevant literature. 6. Conclusion: The conclusion summarizes the key findings, their implications, and the contribution to the field.
References: A list of all the sources and references cited in the thesis. Appendices: Additional materials or data that support the thesis but are not included in the main body of the text.

B. Prerequisites or corequisites

Compulsory courses and elective courses (at least 4 elective courses)

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

Required

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)

2st year

F. Semester when the course unit is delivered

Odd/even semester

G. Mode of delivery (face-to-face, distance learning)

Face to face

7. *Intended Learning Outcomes*

ILO-1: Possess 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. Possess academic ethics.
PI-2. Demonstrate academic integrity.

ILO-3: Able to master one or several mathematical problems in analysis, algebra, applied mathematics, statistics and combinatorics.
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.

8. *Course Learning Outcomes*

1. Students have good Research Skills: Develop advanced research skills, including the ability to formulate research questions, design research methodologies, and collect and analyze data effectively.

2. Student have good Critical Thinking: Enhance critical thinking and problem-solving

abilities to evaluate existing literature, theories, and research findings.

3. Students have ability in Communication: Improve written and oral communication skills to effectively present and defend research findings and arguments.

4. Students have ability to conduct a Literature Review: Conduct a comprehensive literature review, demonstrating an understanding of existing scholarship in the chosen field.

5. Students are become Independence: Demonstrate the ability to work independently and self-motivate to complete a substantial research project.

6. Students have ability to Contribution to Knowledge: Make an original contribution to the academic field by conducting unique research and producing a high-quality thesis.

7. Brief list of topics to be covered
Depend on selected research topic
8. Learning and teaching methods
1. Discussion 2. Directed learning
9. Language of instruction
Bahasa Indonesia
10. Assessment methods and criteria
Assessment rubric

SEMESTER STUDY PLAN
THESIS 1
(COMPULSORY 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
Thesis 1	MAT81104	https://sci.ilearn.unand.ac.id	**3**	**3**	**May 13th, 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	
Intended Learning Outcomes (ILO) and Course Learning Outcomes (ILO)	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 final assignment 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 advanced mathematical research topics or generalize one of the mathematical materials 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 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. (**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	Thesis 1 is one of the requirement of student to complete studies in the Mathematics Masters Program. Thesis 1 produces a thesis draft with advanced mathematical material or generalizations of the mathematical theories that have been studied.	
Study material	1. Determine the research topic and related literature 2. Make a research proposal 3. Create a thesis draft	
References	Main Related Literature	
Learning Media	**Software :**	**Hardware :**
	-	-
Team Teaching	Suvervisor	
Assessment	-	
Required courses	Three elective courses related to the topic thesis	

Weakly Plan Study

Week / Meet (1)	Course Outcomes (2)	Indicator (3)	Assessment (4)	Activities/Forms of Learning [Time estimated]					Subject, references (10)	Weight (11)
				Synchronus*		Asynchronus**		Media (9)		
				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	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 advanced mathematical research topics or generalize one of the mathematical materials 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 the supervisor	Non test : - Test : Seminar 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 basic supporting theories of research topics with advanced mathematics material or generalize one of the mathematical	• Accuracy in writing theories related to research • Accuracy in responding to suggestions/improvements suggested by the supervisor	Non test :	Discussion and presentation		Students work on their thesis: Chapter 1 and Chapter 2		•	Related Literature	40%

	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 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; **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 research conclusions • Accuracy in responding to	Non test	Discussion and presentation		• Students work on their thesis: Chapter 3 and Chapter 4 • Student do assignment : Thesis Seminar (Assessed in a separate exam (thesis seminar)			Related Literature	40%

		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		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	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Indicators, Criteria, and Assessment Weights

1. Assessment weight for each Assessment

No	Assessment	Weight (%)
1	Discussing research topics and research literature	10
2	Discussing the contents of the research proposal	10
3	Discuss and evaluate the results of the research proposal seminar	40
4	Discuss thesis progress	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 (%)
		Discuss research topics and research literature (%)	Discuss the contents of the research proposal (%)	Discuss and evaluate the results of the research proposal seminar (%)	Discuss thesis progress (%)	
1	Able to determine the final assignment 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-	10				**10**

	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 advanced mathematical research topics or generalize one of the mathematical materials 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	Able to write 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. (**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**