Module Description/Course Syllabi

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

1. *Course number and name*

MAT81104 Thesis 2

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 2
(COMPULSORY COURSE)

DEPARTMENT OF MATHEMATICS AND DATA SCIENCE
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
UNIVERSITAS ANDALAS
2024

1 Semester Study Plan

	**SEMESTER STUDY PLAN** **STUDY PROGRAM: MASTER OF MATHEMATICS** **FACULTY OF MATHEMATICS AND NATURAL SCIENCES** **UNIVERSITAS ANDALAS**

SEMESTER LEARNING PLAN

COURSE NAME	COURSE CODE	i-LEARN COURSE URL	CREDITS	SEMESTER	COMPILATION DATE
THESIS II	**MAT 81104**	**http://sci.ilearn.unand.ac.id**	3	4	May 1st, 2024
Person in Charge	**Study Plan Creator**		**Head of Research Group**	**Head of the study program**	
	Prof. Dr. Ferra Yanuar, M.Sc		**Prof. Dr. Ferra Yanuar, M.Sc**	**Prof. Dr. Ferra Yanuar, M.Sc**	

Intended Learning Outcomes (ILO)	**ILO-Study Program**	
	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 most recent advancements in mathematical theory.
	Course Learning Outcome (CLO)	

	1. Students have advanced research skills, including the ability to formulate research questions, design research methodologies, and collect and analyze data effectively (ILO-1) 2. Students have a critical mindset, especially in problem solving to evaluate existing literature, theories, and research findings (ILO-2). 3. Students have the ability to write a comprehensive literature review, demonstrating an understanding of existing science in the chosen field (ILO-3). 4. Students have the ability to work independently and are self-motivated to complete a substantial research project (ILO-5: PI-1, PI-2). 5. Students have the ability to communicate in writing and orally to effectively present and defend research findings and arguments (ILO-5:PI-3). 6. Students have an original contribution to the academic field by conducting research and producing a high-quality thesis (ILO-4, ILO-6).
Brief description of Course	This course discusses research topics involving the following components: (1) Background, outlining the research background, including the reasons for choosing methods and cases raised in research, describing research problems, their significance, and research objectives, (2). Literature Review: This section reviews relevant academic literature to establish the context and theoretical framework of the research, (3) Research methodology: details the research methods and techniques used to collect and analyze data, (4) Results and Discussion: The results section presents research findings based on data analysis, (5) Conclusions and Suggestions: The conclusions summarize the main findings, their implications, and their contribution to the science and the case raised. Suggestions contain research weaknesses that need to be explored in future research, also contain suggestions for using other methods that are considered appropriate to the research topic.
Study Materials	1. Background that describes the background of the research, including the reasons for choosing the methods and cases raised in the research, outlining the research problem, its significance, and the purpose of the research.

	2. Literature Review that reviews the relevant academic literatures to establish the context and theoretical framework of the research. 3. Research methodology that details the research methods and techniques used to collect and analyze data. 4. Results and Discussion that presents research findings based on data analysis and explain the results based on the literature. 5. Conclusions and Suggestions: The conclusions summarize the main findings, their implications, and their contribution to science and the case raised. Suggestions contain research weaknesses that need to be explored in future research, also contain suggestions for using other methods that are considered appropriate to the research topic.	
References	List all sources and references cited in the thesis.	
Learning Media	**Software:**	**Hardware:**
		• Computer/Laptop
Team Teaching	Advisory Commission	
Required courses	All compulsory courses and 3 elective courses	
Academic Norms	Follow the Academic Regulations of Undergraduate Program, Universitas Andalas (https://akademik.unand.ac.id/images/2022-03-30%20Peraturan%20Rektor%20Nomor%207%20Tahun%202022%20Penyelenggaraan%20Pendidikan-khusus%20Bab%20II.pdf)	

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 Students have advanced research skills, including the ability to formulate research questions, design research methodologies, and collect and analyze data effectively (ILO-1)	• Accuracy in formulate research questions, design research methodologies and collect and analyze data effectively.	Non test	Discussion		Students read and study material inhow to answer research questions, methodologies and collect and analyze data effectively			Related Literature	15%

3, 4, 5	CLO-2 Students have a critical mindset, especially in problem solving to evaluate existing literature, theories, and research findings (ILO-2).	• Accuracy in making problem solving to evaluate existing literature, theories, and research findings	Non test : -	Discussion and presentation		• Student evaluate existing literature, theories, and research findings			Related Literature	15%
6,7	CLO-3 Students have the ability to write a comprehensive literature review, demonstrating an understanding of existing science in the chosen field (ILO-3).	• Accuracy in writing a comprehensive literature review, demonstrating an understanding of existing science in the chosen field	Non test :	Discussion and presentation		Students write a comprehensive literature review, demonstrating an understanding of existing science in the chosen field			Related Literature	15%

8,9	CLO 4: Students have the ability to work independently and are self-motivated to complete a substantial research project (ILO-5: PI-1, PI-2).	• Accuracy in working independently and have self-motivated to complete a substantial research project	Non test :	Discussion and presentation		Student work independently and have self-motivated to complete a substantial research project			Related Literature	15%
10, 11, 12, 13	CLO-5 Students have the ability to communicate in writing and orally to effectively present and defend research findings and arguments (ILO-5:PI-3).	• Accuracy in communicat e in writing and orally to effectively present and defend research findings and arguments	Test : Thesis Defence	Discussion and presentation		• Students communicat e in writing and orally to effectively present and defend research findings and arguments			Related Literature	20%

14-16	CLO-6: Students have an original contribution to the academic field by conducting research and producing a high-quality thesis (ILO-4, ILO-6).	• Accurate contribution to the academic field by conducting research and producing a high-quality thesis	Non test	Discussion and presentation		• Student contribute to the academic field by conducting research and producing a high-quality thesis			Related Literature	20%

II. Indicators, Criteria and Proportions of Assessment

NO	FORM OF ASSESSMENT	PROPORTION (%)
1	Formulate a research problem	15%
2	Writing a Literature Review	30%
3	Formulate research methodology	15%
4	Results and Discussion	40 %
TOTAL		**100%**

Assessment proportion for each Course Learning Outcome (CLO):

- CLO 1: 15 %
- CLO 2: 15%
- CLO 3: 15 %
- CLO 4: 15 %
- CLO 5: 20 %
- CLO 6: 20 %

III. Assessment Plan Table

Form of assessment **Course Learning Outcomes (CLO)**	**Formulate a research problem**	**Writing a Literature Review**	**Formulate research methodology**	**Results and Discussion**	**Total of Proportion**
1. Students have advanced research skills, including the ability to formulate research questions, design research methodologies, and collect and analyze data effectively (ILO-1)	15%				15%
2. Students have a critical mindset, especially in problem solving to evaluate existing literature, theories, and research findings (ILO-2).		15%			15%
3. Students have the ability to write a comprehensive literature review, demonstrating an understanding of existing science in the chosen field (ILO-3).		15%			15%
4. Students have the ability to work independently and are self-motivated to complete a substantial research project (ILO-5: PI-1, PI-2).			15%		15%

5. Students have the ability to communicate in writing and orally to effectively present and defend research findings and arguments (ILO-5; PI-3).				20%	20%
6. Students have an original contribution to the academic field by conducting research and producing a high-quality thesis (ILO-4, ILO-6).				20%	20%
Total of Proportion	15%	30%	15%	40%	100%