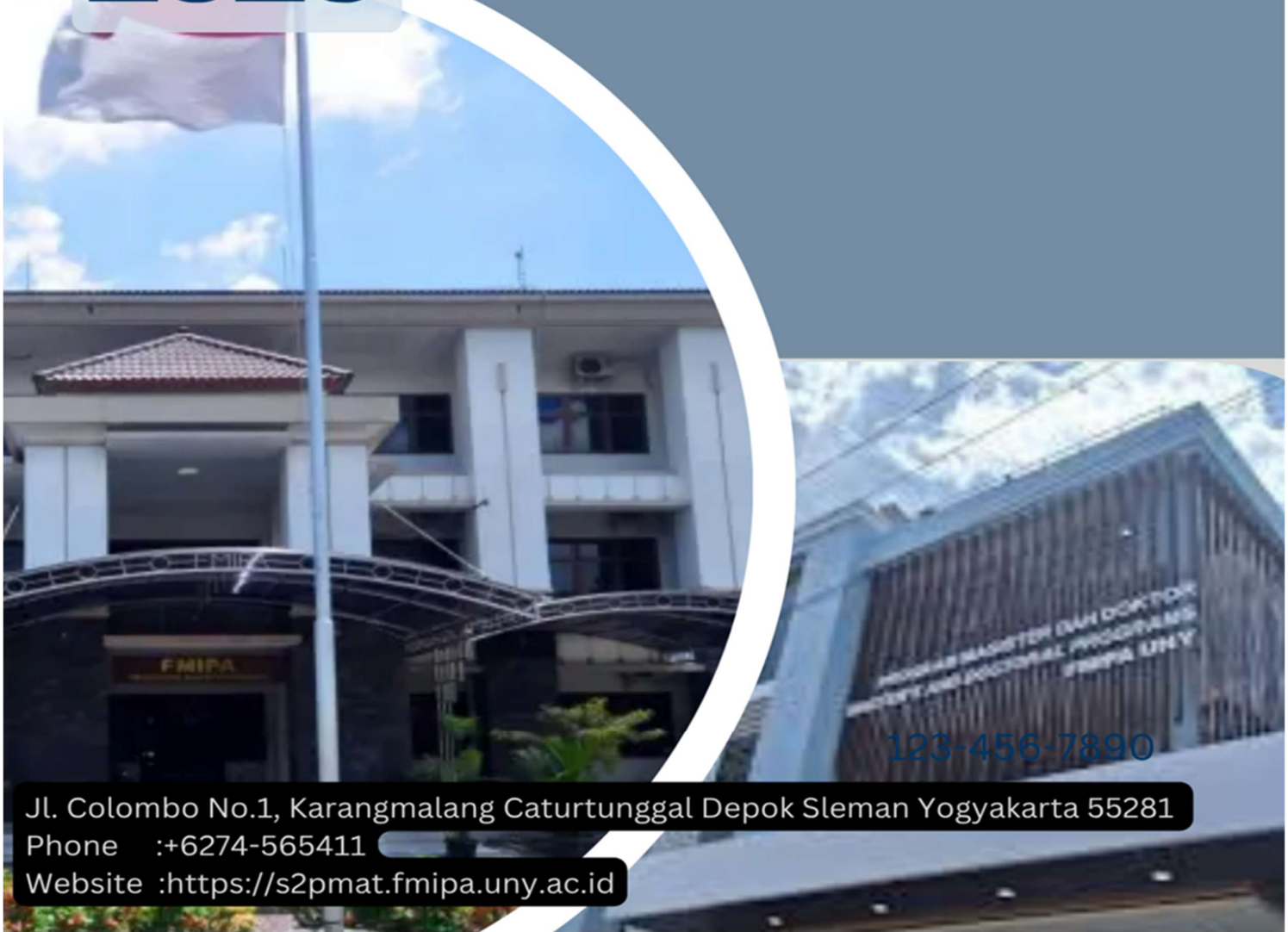
Ministry of Higher Education, Science and Technology
Yogyakarta State University
FACULTY OF MATHEMATICS AND NATURAL SCIENCES

CURRICULUM
MASTER OF EDUCATION IN MATHEMATICS

2025



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FOREWORD OF THE STUDY PROGRAM COORDINATOR

The 2025 Curriculum of the Master of Mathematics Education Study Program FMIPA UNY is prepared based on Law Number 12 of 2012 concerning Higher Education, Permendikbudristek No. 53 of 2023, Permendiktisaintek No. 39 of 2025 concerning quality assurance of higher education, the fifth edition of the Higher Education Curriculum Preparation Handbook has been published by the Directorate of Learning and Student Affairs, the Directorate General of Higher Education, Research, and Technology, Ministry of Education, Culture, Research, and Technology in 2024 and guidelines for the preparation of the 2025 UNY curriculum.

The process of preparing the 2025 curriculum goes through several stages, namely (1) Comparative Study, (2) Study Tracer, (3) 2020 Curriculum Review, and (4) Curriculum Design Workshop. One of the important stages is the curriculum preparation design workshop which is a refinement of the 2020 curriculum and organized by the Master of Mathematics education study program attended by all lecturers, alumni, graduate users with the guidance of education experts in fields in accordance with the Master of Mathematics Education Study Program.

The curriculum of the Master of Mathematics Education Study Program FMIPA UNY contains the scientific vision, mission, goals, competencies of graduates, list of compulsory courses, distribution of courses each semester, and a map of the relationship between courses and essential learning outcomes, graduate profiles and vision and mission of the Master of Mathematics Education Study Program. We hope that this curriculum will make a considerable contribution in producing qualified graduates at the national and international levels and provide convenience in the implementation of education.

Yogyakarta, 16 Juni 2025
Study Program Coordinator

Prof. Dr. Agus Maman Abadi, M.Si.
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A. VISION, MISSION, AND EDUCATIONAL GOALS OF THE STUDY PROGRAM

1. Scientific Vision of Study Program

   To become a superior, creative, and innovative study program that is sustainable in producing graduates who master and apply cognitive psychology, didactic pedagogy, and globally competitive mathematics learning media.

2. Study Program Mission
   a. Organizing superior, creative, and innovative education to produce graduates who master, develop, and apply cognitive psychology, didactic pedagogy, and mathematics learning media in a sustainable and globally competitive manner.
   b. Carry out research oriented to the scientific development of mathematics education, with a focus on cognitive psychology, didactic pedagogy, and learning media, in order to produce innovative solutions in facing the challenges of mathematics learning in the 21st century.
   c. Carrying out science-based community service in mathematics education to improve mathematics literacy, empower educators, and advance the quality of mathematics learning at various levels of education through innovative and sustainable approaches.
   d. Strengthen national and international cooperation networks with educational institutions, research institutions, and international organizations to support the development of globally competitive and innovation-based mathematics education.
   e. Continuously improving the quality of academic resources and services to create an educational ecosystem conducive to the development of innovations in cognitive psychology, didactic pedagogy, and mathematics learning media.

3. Study Program Objectives
   a. Formulation of Study Program Educational Objectives (TPP)

      TPP 1 : **Producing graduates** who excel in mastering, developing, and applying mathematics education in the fields of cognitive, didactic, learning media, and evaluation, which have global competitiveness.

      TPP 2 : **To make** a real contribution to the development of mathematics education through research that is innovative, applicatable, and relevant to the learning needs of the 21st century.

      TPP 3 : **To make** a real contribution to society through science-based service activities in mathematics education that empower educators and improve the quality of mathematics learning.

      TPP 4 : **Strengthening collaboration networks** with national and international institutions to support the development of globally competitive and sustainable study programs.

      TPP 5 : **Develop a quality academic ecosystem by improving the quality of human resources, facilities, and educational services to create a conducive and innovative learning environment.**

   b. Conformity of the Educational Objectives of the Study Program with the Vision of Universities, Faculties, and Study Programs.

Table 4. TPP Conformity Matrix with the Vision of Universities, Faculties, and Study Programs

TPP	Vision UNY			Vision MIPA			Scientific Vision Prodi		
	Superior	Creative	Innovative Continuous	Superior	Creative	Innovative Continuous	Transformatif	Creative Innovative	Insightful Global

TPP 1	√		√	√		√	√		√
TPP 2	√	√		√	√		√	√	
TPP 3		√	√		√	√		√	√
TPP 4	√	√		√	√		√	√	
TPP 5			√			√			√

c. Conformity of Study Program Educational Objectives with the Indonesian National Qualification Framework (KKNI)

Table 5. Suitability of the Educational Objectives of the Master of Mathematics Education Study Program

KKNI Level 6 Description	Educational Objectives of Study Programs				
	TPP 1	TPP 2	TPP 3	TPP 4	TPP 5
Able to develop mathematical learning approaches based on cognitive psychology, didactic pedagogy, and learning technology/media through innovative and tested research.	√	√	√		√
Able to design and implement mathematical learning models, strategies, and media that are creative and adaptive to the global context and learning needs of the 21st century.	√	√	√		√
Able to solve mathematics learning problems through an interdisciplinary approach that integrates cognitive, pedagogical, and educational technology theory.	√	√	√	√	√
Able to communicate the results of thoughts, research, or innovative works in the field of mathematics education scientifically, both orally and in writing, in national and international forums.	√	√	√	√	√

B. GRADUATE PROFILE AND DESCRIPTION

1. Graduate Profile and Profile Description

Table 6. Graduate Profile and Profile Description
Master of Mathematics Education Study Program UNY

Graduate Profile	Description
Mathematics educator	Educators who excel in designing and implementing mathematics learning based on cognitive approaches, didactic pedagogy, and the use of modern learning

	media that are adaptive to global challenges.
Mathematics education researcher	Designer and implementer of innovative and applicable research in the field of mathematics education, with the foundation of cognitive and didactic psychology theory, in order to produce solutions to current and future learning problems.
Developer of mathematics education media and teaching materials	Developer of creative, interactive, and technology-based mathematics learning media and teaching materials, taking into account the cognitive characteristics of learners and pedagogical principles to support effective and globally competitive learning.

2. Suitability of Graduate Profiles with the Educational Objectives of the Study Program

Table 7. Suitability of Graduate Profiles with Educational Objectives
Master of Mathematics Education Study Program UNY

Graduate Profile	TPP 1	TPP 2	TPP 3	TPP 4	TPP 5
Math educator	√	√	√	√	√
Mathematics education researcher	√	√	√	√	√
Developer of mathematics education media and teaching materials	√	√	√	√	√

C. GRADUATE LEARNING OUTCOMES

1. Summary of Graduate Learning Outcomes (CPL)

Table 8. CPL Master of Education in Mathematcics Study Program

No	CPL Description
CPL-1	Merealisasikan nilai religi, etika akademik, dan tanggung jawab sebagai wujud berjiwa Pancasila. *Implementing the value of religion, academic ethics, and responsibility as a form of Pancasila.*
CPL-2	Menguasai teori pedagogik dan didaktik, kurikulum, dan asesmen pendidikan matematika. *Mastering pedagogical and didactic theories, curriculum, and assessment on mathematics education.*
CPL-3	Mendemonstrasikan penguasaan literatur dan konsep yang berkaitan dengan praktik pendidikan matematika. *Demonstrate the ability on mastering literature and concepts related to mathematics education practice.*
CPL-4	Mendemonstrasikan penguasaan pemecahan masalah matematika sekolah dan konsep matematika pendidikan tinggi.

	Demonstrate the ability to solve mathematical school problem and higher education mathematics concepts.
CPL-5	Mampu menganalisis isu-isu kekinian pendidikan matematika secara kritis menggunakan pendekatan interdisiplin dan multidisiplin. *Able to critically analyze current issues in mathematics education using interdisciplinary and multidisciplinary approaches.*
CPL-6	Mampu melakukan seluruh tahapan riset dan pengembangan pendidikan matematika yang bermanfaat bagi masyarakat, *stakeholder*, dan keilmuan. *Able to carry out all stages of research and development of mathematics education that is beneficial to society, stakeholders, and science.*
CPL-7	Mengkomunikasikan temuan ilmiah bidang pendidikan matematika pada forum maupun jurnal di tingkat nasional atau internasional. *Communicating findings of mathematics education research in scientific conference or journals nationally or internationally.*
CPL-8	Memiliki keterampilan berpikir logis, kritis, sistematis dan kreatif. *Able to think logically,critically,systematically and creative.*
CPL-9	Menunjukkan daya adaptasi, kemandirian, kepemimpinan dan kemampuan bekerja sama. *Demonstrate the abality to adapt, to lead and to work independently and collaboratively.*

Table 9. Identify CPL Structure based on Ability, Study Material, and Context

CPL	CPL Statement	Kemampuan (Behavior)	Bahan Kajian (Subject Matter)	Konteks (Context)
CPL-1	Merealisasikan nilai religi, etika akademik, dan tanggung jawab sebagai wujud berjiwa Pancasila. *Implementing the value of religion, academic ethics, and responsibility as a form of Pancasila.*	Apply and demonstrate a professional attitude	Academic ethics, Pancasila values, scientific responsibility	Academic and community environment
CPL-2	Menguasai teori pedagogik dan didaktik, kurikulum, dan asesmen pendidikan matematika. *Mastering pedagogical and didactic theories, curriculum, and assessment on mathematics education.*	Mastering and applying concepts	Pedagogic, didactic, curriculum, and assessment theories	Mathematics learning at different levels
CPL-3	Mendemonstrasikan penguasaan literatur dan konsep yang berkaitan dengan praktik pendidikan matematika. *Demonstrate the ability on mastering literature and concepts related to mathematics education practice.*	Review, evaluate, and apply literature	Mathematics education literature, learning practices	Teaching and research context

CPL-4	Mendemonstrasikan penguasaan pemecahan masalah matematika sekolah dan konsep matematika pendidikan tinggi. *Demonstrate the ability to solve mathematical school problem and higher education mathematics concepts.*	Solve and explain math problems	School and college math materials	Learning activities and curriculum development
CPL-5	Mampu menganalisis isu-isu kekinian pendidikan matematika secara kritis menggunakan pendekatan interdisiplin dan multidisiplin. *Able to critically analyze current issues in mathematics education using interdisciplinary and multidisciplinary approaches.*	Critically analyze and evaluate	Contemporary issues of mathematics education, an inter/multidi-syllinear approach	Scientific forums, education policy, classroom practice
CPL-6	Mampu melakukan seluruh tahapan riset dan pengembangan pendidikan matematika yang bermanfaat bagi masyarakat, *stakeholder*, dan keilmuan. *Able to carry out all stages of research and development of mathematics education that is beneficial to society, stakeholders, and science.*	Design, implement, and evaluate research	Methodology for research and development of mathematics education	Academic, professional, and societal contexts
CPL-7	Mengkomunikasikan temuan ilmiah bidang pendidikan matematika pada forum maupun jurnal di tingkat nasional atau internasional. *Communicating findings of mathematics education research in scientific conference or journals nationally or internationally.*	Compiling and presenting research results	Results of mathematics education research	Seminars, conferences, scientific journals
CPL-8	Memiliki keterampilan berpikir logis, kritis, sistematis dan kreatif. *Able to think logically,critically,systematically and creative.*	Think and devise innovative solutions	Logic, systematics of thinking, creativity	Problem-solving in learning and research
CPL-9	Menunjukkan daya adaptasi, kemandirian, kepemimpinan dan kemampuan bekerja sama. *Demonstrate the abality to adapt, to lead and to work*	Adapt, lead, and collaborate	Professional and social character	Academic, organizational, and community collaboration

	independently and collaboratively.			

2. Conformity of Graduate Learning Outcomes with the Educational Objectives of the Study Program

Table 10. Compatibility between CPL and TPP

CPL	CPL Statement	TPP 1	TPP 2	TPP 3	TPP 4	TPP 5
CPL-1	Merealisasikan nilai religi, etika akademik, dan tanggung jawab sebagai wujud berjiwa Pancasila. *Implementing the value of religion, academic ethics, and responsibility as a form of Pancasila.*	√		√	√	√
CPL-2	Menguasai teori pedagogik dan didaktik, kurikulum, dan asesmen pendidikan matematika. *Mastering pedagogical and didactic theories, curriculum, and assessment on mathematics education.*	√		√		√
CPL-3	Mendemonstrasikan penguasaan literatur dan konsep yang berkaitan dengan praktik pendidikan matematika. *Demonstrate the ability on mastering literature and concepts related to mathematics education practice.*	√	√	√		√
CPL-4	Mendemonstrasikan penguasaan pemecahan masalah matematika sekolah dan konsep matematika pendidikan tinggi. *Demonstrate the ability to solve mathematical school problem and higher education mathematics concepts.*	√	√	√		√
CPL-5	Mampu menganalisis isu-isu kekinian pendidikan matematika secara kritis menggunakan pendekatan interdisiplin dan multidisiplin. *Able to critically analyze current issues in mathematics education using*	√	√	√	√	√

	interdisciplinary and multidisciplinary approaches.					
CPL-6	Mampu melakukan seluruh tahapan riset dan pengembangan pendidikan matematika yang bermanfaat bagi masyarakat, *stakeholder*, dan keilmuan. *Able to carry out all stages of research and development of mathematics education that is beneficial to society, stakeholders, and science.*	√	√	√	√	√
CPL-7	Mengkomunikasikan temuan ilmiah bidang pendidikan matematika pada forum maupun jurnal di tingkat nasional atau internasional. *Communicating findings of mathematics education research in scientific conference or journals nationally or internationally.*	√	√	√	√	√
CPL-8	Memiliki keterampilan berpikir logis, kritis, sistematis dan kreatif. *Able to think logically,critically,systematically and creative.*	√	√	√	√	√
CPL-9	Menunjukkan daya adaptasi, kemandirian, kepemimpinan dan kemampuan bekerja sama. *Demonstrate the abality to adapt, to lead and to work independently and collaboratively.*	√	√	√	√	√

3. Suitability of Graduate Learning Outcomes with Graduate Profiles

The following table is the suitability between the Graduate Learning Outcomes and the graduate profile.

Table 11. Table of Compatibility between Graduate Learning Outcomes with Graduate Profile

Graduate Profile	CPL								
	1	2	3	4	5	6	7	8	9
Mathematics educator	√	√	√	√	√	√	√	√	√
Mathematics education researcher	√	√	√	√	√	√	√	√	√

Developer of mathematics education media and teaching materials	√	√	√	√	√	√	√	√	√

D. CURRICULUM STRUCTURE AND COURSE DISTRIBUTION

Description of the curriculum structure of the study program, for example, consisting of scientific foundation courses, expertise courses, concentration elective skill courses, prerequisite courses, additional courses, etc.

1. Distribution of Graduate Learning Outcomes (CPL) in Courses

Table 17. Distribution of Graduate Learning Outcomes (CPL) in Courses
Master of Education in Mathematics Study Program

No	Kode	Mata Kuliah	CPL									SKS	ECTS
			1	2	3	4	5	6	7	8	9		
1	FMI80201	Filsafat Ilmu *Philosophy of Science*	√	√						√		2	6,46
2	FMI80202	Statistika *Statistics*				√		√				2	6,46
3	FMI80301	Metodologi Penelitian Pendidikan *Research Methodology in Education*					√	√	√	√		3	9,69
4	MME80201	Analisis Real *Real Analysis*				√				√		2	6,46
5	MME80202	Strategi Pembelajaran Matematika Inovatif *Innovation in Mathematics Instruction Strategy*		√	√							2	6,46
6	MME80203	Teknologi Digital Pembelajaran Matematika *Digital Technology in Mathematics Instruction*				√			√		√	2	6,46
7	MME80204	Daya Matematika *Mathematical Power*		√	√	√						2	6,46
8	MME80205	Geometri *Geometry*				√				√		2	6,46
9	MME80206	Kajian Masalah-Masalah Pendidikan Matematika *Study on Issues in Mathematics Education*		√			√					2	6,46
10	MME80207	Psikologi Belajar Matematika *Psychology of Learning Mathematics*		√	√							2	6,46
11	MME80208	Asesmen Pembelajaran Matematika *Assessment of Mathematics Instruction*		√				√				2	6,46

12	MME80209	Praktikum Inovasi Pembelajaran Matematika *Practicum on Innovation Mathematics-Instruction*		√	√							2	6,46
13	MME80310	Proposal Tesis *Thesis Proposal*	√				√	√			√	3	9,69
14	MME80210	Statistika Matematika *Mathematical Statistics*				√				√		2	6,46
15	MME80211	Penulisan Artikel Ilmiah *Scientific Article Writing*	√				√		√	√		2	6,46
16	MME81001	Tugas Akhir Magister *Graduate Thesis*	√				√	√	√			10	32,3
17	MME80212	Aljabar Abstrak *Abstract Algebra*				√				√		2	6,46
18	MME80213	Analisis Numerik *Numerical Analysis*				√				√		2	6,46
19	MME80214	Analisis Statistika Multivariat *Multivariate Statistical Analysis*				√				√		2	6,46
20	MME80215	Teori Himpunan Samar *Fuzzy Set Theory*				√				√		2	6,46
21	MME80216	Pembelajaran Mesin *Machine Learning*				√				√		2	6,46
22	MME80217	Persamaan Differensial *Differential Equation*				√				√		2	6,46
23	MME80218	Teori Bilangan dan Aplikasinya *Number Theory and Its Applications*				√				√		2	6,46
24	MME80219	Kajian Kurikulum Pendidikan Matematika *Mathematics Education Curriculum Analysis*		√	√					√		2	6,46
25	MME80220	Etnomatematika *Ethnomathematics*			√					√		2	6,46
26	MME80221	Matematika Model *Mathematical Modelling*			√					√		2	6,46
27	MME80222	Pendidikan Matematika Realistik *Realistic Mathematics Education*			√					√		2	6,46
28	MME80223	Pembelajaran Matematika Berbasis Kecerdasan Buatan *Artificial Intelligence Based Mathematics Instruction*			√					√		2	6,46
29	MME80224	Pemrograman Media Berbasis Web			√					√		2	6,46

		Web-Based Instructional Media Programming											
30	MME80225	Matematika Sekolah Kurikulum Internasional *Mathematics Curriculum of International School*			√					√		2	6,46
31	MME80226	Evaluasi Program Pendidikan Matematika *Evaluation in Mathematics Education Programme*		√	√					√		2	6,46
32	MME80227	Perencanaan dan Pengembangan Media Pembelajaran Matematika. *Planning and Developing Mathematics Instructional Media*		√	√							2	6,46
33	MME80228	Kajian Kurikulum dan Strategi Pembelajaran Matematika *Study on Curriculum and Mathematics Instructional Strategy*		√	√							2	6,46

2. Course Distribution

Table 18. Distribution of Semester I Courses

Semester I				
No	Code	Courses	SKS	ECTS
1	FMI80201	Filsafat Ilmu *Philosophy of Science*	2	6,46
2	FMI80202	Statistika *Statistics*	2	6,46
3	FMI80301	Metodologi Penelitian Pendidikan *Research Methodology in Education*	3	9,69
4	MME80201	Analisis Real *Real Analysis*	2	6,46
5	MME80202	Strategi Pembelajaran Matematika Inovatif *Innovation in Mathematics Instruction Strategy*	2	6,46
6	MME80203	Teknologi Digital Pembelajaran Matematika *Digital Technology in Mathematics Instruction*	2	6,46
7	MME80206	Kajian Masalah-Masalah Pendidikan Matematika *Study on Issues in Mathematics Education*	2	6,46
8	MME80207	Psikologi Belajar Matematika *Psychology of Learning Mathematics*	2	6,46

	Total SKS & ECTS	17	54,91

Table 19. Distribution of Semester II Courses

Semester II				
No	Code	Courses	SKS	ECTS
1	MME80204	Daya Matematika	2	6,46
		Mathematical Power		
2	MME80205	Geometri	2	6,46
		Geometry		
3	MME80208	Asesmen Pembelajaran Matematika	2	6,46
		Assessment of Mathematics Instruction		
4	MME80209	Praktikum Inovasi Pembelajaran Matematika	2	6,46
		Practicum on Innovation Mathematics-Instruction		
5	MME80310	Proposal Tesis	3	9,69
		Thesis Proposal		
		Total SKS & ECTS	11	35,53

Table 20. Distribution of Semester III Courses

Semester III				
No	Code	Courses	SKS	ECTS
1	MME80211	Penulisan Artikel Ilmiah	2	6,46
		Scientific Article Writing		
2		Mata Kuliah Pilihan Matematika	2	6,46
		Elective courses in Mathematics		
3		Mata Kuliah Pilihan Pendidikan Matematika	2	6,46
		Elective courses in Mathematics Education		
		Total SKS & ECTS	6	19,38

Table 21. Distribution of Semester IV Courses

Semester IV				
No	Code	Courses	SKS	ECTS
1	MME81001	Tugas Akhir Magister	10	32,2
		Graduate Thesis		
		Total SKS & ECTS	10	32,3
Total Credits & ECTS in full (semester 1-semester 4)			44	142,12

Table 22. List of Mathematics Elective Courses

Elective Mathematics Courses				
No	Code	Courses	SKS	ECTS
1	MME80210	Statistika Matematika	2	6,46
		Mathematical Statistics		
2	MME80212	Aljabar Abstrak	2	6,46
		Abstract Algebra		
3	MME80213	Analisis Numerik	2	6,46
		Numerical Analysis		
4	MME80214	Analisis Statistika Multivariat	2	6,46
		Multivariate Statistical Analysis		
5	MME80215	Teori Himpunan Samar	2	6,46
		Fuzzy Set Theory		
6	MME80216	Pembelajaran Mesin	2	6,46
		Machine Learning		
7	MME80217	Persamaan Differensial	2	6,46
		Differential Equation		
8	MME80218	Teori Bilangan dan Aplikasinya	2	6,46
		Number Theory and Its Applications		

Table 23. List of Mathematics Education Elective Courses

Mathematics Education Elective Courses				
No	Code	Courses	SKS	ECTS
1	MME80219	Kajian Kurikulum Pendidikan Matematika	2	6,46
		Mathematics Education Curriculum Analysis		
2	MME80220	Etnomatematika	2	6,46
		Ethnomathematics		
3	MME80221	Matematika Model	2	6,46
		Mathematical Modelling		
4	MME80222	Pendidikan Matematika Realistik	2	6,46
		Realistic Mathematics Education		
5	MME80223	Pembelajaran Matematika Berbasis Kecerdasan Buatan	2	6,46
		Artificial Intelligence Based Mathematics Instruction		
6	MME80224	Pemrograman Media Berbasis Web	2	6,46
		Web-Based Instructional Media Programming		
7	MME80225	Matematika Sekolah Kurikulum Internasional	2	6,46
		Mathematics Curriculum of International School		
8	MME80226	Evaluasi Program Pendidikan Matematika	2	6,46
		Evaluation in Mathematics Education Programme		

Table 24. List of Matriculation Courses

Matriculation Courses				
No	Code	Courses	SKS	ECTS
1	MME80227	Perencanaan dan Pengembangan Media Pembelajaran Matematika. *Planning and Developing Mathematics Instructional Media*	2	6,46
2	MME80228	Kajian Kurikulum dan Strategi Pembelajaran Matematika *Study on Curriculum and Mathematics Instructional Strategy*	2	6,46

E. COURSE DESCRIPTION

Table 26. Course Description of the Master of Mathematics Education Study Program

No. 1	FMI80201	Filsafat Ilmu *Philosophy of Science*	2 sks	Prerequisite:-
The study of Philosophy of Science lectures includes: (1) Main Problems in the Development of Knowledge, (2) Characteristics of Science, (3) Objects of Knowledge, (4) Methods of Knowledge Development, (5) Tools of Knowledge Development, (6) History of Scientific Development, (7) Pre-Assumptions and Basic Assumptions of Knowledge Development, (8) Sources and Limits of Knowledge Development, (9) Justification of Science, (10) Principles of Knowledge Development, (11) Various Streams of Knowledge Development which include (a) views of absolutists and fabilis about mathematics, (b) mechanistic, empirical, structuralist, and empirical views on mathematics education, (12) Ontology of Science, (13) Epistemology of Science, and (14) Axiology of Science, (15) Philosophy of Mathematics, and (16) Philosophy of Mathematics Education.				
No. 2	FMI80202	Statistika *Statistics*	2 sks	Prerequisite: -
This course studies the concepts and paractics as well as aspects of multivariate analysis, matrices and random vectors, multivariate analysis of the comparison of multiple vector averages, multivariate variance analysis, assumptions in multivariate variance analysis, multivariate covariance analysis, and assumptions in multivariate covariance analysis.				
No. 3	FMI80301	Metodologi Penelitian Pendidikan *Research Methodology in Education*	3 sks	Prerequisite: -
This course discusses quantitative and qualitative research methodologies. Quantitative research methodology material includes the domain of educational research, types of educational research, fundamentals of educational research, research problems, research variables, theoretical studies from learning sources, hypothesis formulation (if any), sampling techniques, research indicators and instruments, validity and reliability of instruments, research data analysis techniques, and reporting of research results, and review of research results both in the form of reports and educational research journals mathematics. The material on qualitative research methodology includes the basics of qualitative research methods, the development of assumptions in qualitative research, various types of qualitative research methods, principles and procedures of qualitative research research, data collection techniques in qualitative research, data analysis techniques in qualitative research, as well as reviewing various qualitative research reports with qualitative descriptive methods, class action (action reaserach), design research, and case, ethnographic, and historical.				
No. 4	MME80201	Analisis Real *Real Analysis*	2 sks	Prerequisite: -
In the Real Analysis course, the basics in mathematics analysis related to differential and integrals are discussed. Differential topics in R1 studied include derivatives, interior maximum theorems, role theorems, mid-value theorems, L'Hopital rules, Taylor theorems, and limit and derivative exchanges. The topics of the Riemann integral in R1 studied include the definition of the Riemann integral and its				

generalizations, the functions of the Riemann integral function, the fundamental theorem, and the related theorems.				
No. 5	MME802 02	Strategi Pembelajaran Matematika Inovatif *Innovation in Mathematics Instruction Strategy*	2 sks	Prerequisite: -
This course material includes the nature of mathematics and school mathematics, philosophy of mathematics learning, theories of learning mathematics, innovative mathematical learning models/approaches/strategies/methods, strategies for developing students' thinking and character skills, management of innovative mathematics learning, and designing teaching materials to develop certain mathematical abilities based on innovative learning models/approaches/strategies/methods.				
No. 6	MME802 03	Teknologi Digital Pembelajaran Matematika *Digital Technology in Mathematics Instruction*	2 sks	Prerequisite:-
The material discussed in this lecture includes: 1) issues of integrating IT in mathematics learning; 2) IT software and applications for mathematics learning; 3) review of IT-based applications and learning media and (4) the creation of IT-based applications to help mathematics learning and prepare mathematics learning plans using applications that have been prepared.				
No. 7	MME802 04	Daya Matematika *Mathematical Power*	2 sks	Prerequisite: -
This course studies three main aspects of mathematical power, namely: process standards, mathematical abilities, and a glimpse of mathematical topics (content strands). The thought process includes conceptual understanding and procedural knowledge. Mathematical skills include problem solving, reasoning, communication, connections, and representation. The two aspects of mathematical power will be associated with the discussion of mathematical topics (content strands).				
No. 8	MME802 05	Geometri *Geometry*	2 sks	Prerequisite: -
This course studies axiomatic/deductive methods and their application in geometry. The material discussed includes Euclidean Geometry and Non-Euclidean Geometry deductively and rigorously.				
No. 9	MME802 06	Kajian Masalah-Masalah Pendidikan Matematika *Study on Issues in Mathematics Education*	2 sks	Prerequisite: -
In this course, various mathematics education problems are discussed. These problems include (1) student cognition problems, (2) student differences problems; (3) curriculum problems, (4) problems of approaches, strategies, or learning methods; (5) the problem of the performance of school students and students; (6) classroom management problems; (7) evaluation issues; and (8) research results. This course provides students with the ability to identify mathematics education problems and determine their solution strategies.				
No. 10	MME802 07	Psikologi Belajar Matematika *Psychology of Learning Mathematics*	2 sks	Prerequisite: -
Mathematics Learning Psychology lecture material includes basic principles of information processing that support the achievement of meaningful learning. This includes the formation of mathematical concepts, ideas from schemas, types of imagery, the process of constructing mathematical information into mathematical knowledge, as well as encoding and retrieval strategies. The topics of learning difficulties studied include how to diagnose math learning difficulties, how to diagnose problem-solving difficulties, and how to remistress. This includes why some mathematics materials are difficult to learn and understand from cognitive load and social-cognitive factors (self-belief about intelligent, self-belief about knowledge, self-direction, self-efficacy, self-esteem and metacognitive skills). The problem-solving topics studied include problem solving procedures, how to develop problem solving expertise and the ability to transfer learning results to the realm of higher thinking. In addition, factors that affect the mathematics learning process and various intelligences are also studied.				
No. 11	MME802 08	Asesmen Pembelajaran Matematika *Assessment of Mathematics Instruction*	2 sks	Prerequisite: -
This course examines learning assessments and their application in learning, especially mathematics learning, including utilizing assessment/evaluation results. The material studied includes the concepts				

of tests, measurements, assessments, evaluations, the relationship between evaluation and learning, types of assessments including authentic assessments, determination of validity and reliability, item analysis (practical, theoretical/qualitatively and empirically manually or using relevant item analysis programs), as well as the preparation and development of instruments for learning assessment/evaluation, improvement of mathematics learning, or mathematics education research.				
No. 12	MME802 09	Praktikum Inovasi Pembelajaran Matematika *Practicum on Innovation Mathematics-Instruction*	2 sks	Prerequisite: -
This course focuses on learning/research practices in schools or colleges. The material studied includes various innovations in mathematics learning (such as innovative learning models, innovative learning strategies, innovative learning media, and ICT-based learning), types or research methods (such as classroom action research and pseudo-experiment research), research plans to be carried out, learning implementation plans, as well as research data collection instruments, learning/research implementation in schools, reflection learning, as well as seminars on the process and results of research analysis.				
No. 13	MME803 10	Proposal Tesis *Thesis Proposal*	3 sks	Prerequisite: FMI80301
This course material includes writing a thesis proposal and ends with a thesis proposal seminar. The material studied is a Guide to Thesis Proposal Preparation, the rules for writing scientific papers, the selection of research topics, the preparation of introductions, the preparation of theoretical studies, the preparation of research methodologies, the writing of references, and the preparation of research instruments. The development and writing of the Research Introduction Part includes: (1) Preparation of Problem Identification and Research Background, (2) Preparation of Problem Formulation and Research Objectives, (3) Preparation of Research Title, and (4) Elaboration and Preparation of Research Framework. The preparation of the Theory Study section includes: (1) Exploration and management of formal Legal References, (2) Normative Reference of Hypothesis, (3) Empirical Normative Reference, and (4) Empirical Reference to build the Foundation of Theory/Literature Review. Developing and writing the Research Methodology Section includes: (1) Research Design, (2) Instrument Development, (3) Instrument Validation, (3) Data Collection Techniques, and (4) Data Analysis Techniques.				
No. 14	MME802 10	Statistika Matematika *Mathematical Statistics*	2 sks	Prerequisite: -
This course studies about the definition of chances, random variables and their distributions, properties of random variables, co-distribution of random variables, functions of random variables, transformations of random variables, sequence statistics, limit distributions, sampling distributions, point estimators of a parameter and its properties, properties of estimators, sufficiency and completeness of statistics, and properties of sufficiency				
No. 15	MME802 11	Penulisan Artikel Ilmiah *Scientific Article Writing*	2 sks	Prerequisite:: MME80310
The Scientific Paper Writing course includes material on: (1) types of scientific papers, (2) reference management using reference managers, (3) citation and reference writing, (3) structure of scientific articles, (4) preparation of introductions, (5) preparation of methods, (6) preparation of results and discussion, (7) preparation of conclusions and suggestions, titles and abstracts, (9) style of language of scientific articles, and (10) practice of writing scientific articles.				
No. 16	MME810 01	Tugas Akhir Magister *Graduate Thesis*	10 sks	Prerequisite:MME80310
A thesis is a final project prepared by students as a form of scientific work in the field of mathematics education. The thesis is prepared based on the knowledge and skills that have been obtained in previous courses and is done by following the rules of scientific research. As a continuation of the Thesis Proposal course, the Thesis course focuses on the preparation and testing of valid research instruments, data collection, data analysis, conclusion drawn, writing thesis research reports, thesis exams, and article writing.				
No. 17		Aljabar Abstrak	2	Prerequisite:-

	MME802 12	*Abstract Algebra*	sks	
The Abstract Algebra course equips students to explore concepts and sharpen proofs about groups, normal subgroups, permutation groups, cyclic groups, Lagrange Theorem, factor groups, group homomorphisms, group isomorphism theorem, Sylow Theorem, and their applications.				
No. 18	MME802 13	Analisis Numerik *Numerical Analysis*	2 sks	Prerequisite: -
The Numerical Analysis course studies the basics of numerical and error computing, the use of numerical computing to find the roots of nonlinear equations, the solution of linear equation systems, and various polynomial interpolations and their error measurements, approximation, numerical differential, numerical integration. All of these topics are implemented using programming.				
No. 19	MME802 14	Analisis Statistika Multivariat *Multivariate Statistical Analysis*	2 sks	Prerequisite:-
This course includes multivariate linear regression models, major component analysis, multidimensional scale analysis, factor analysis, canonical correlation analysis, cluster analysis, and discriminant analysis. Students will gain the skills to analyze multivariate data with statistical software and interpret the results.				
No. 20	MME802 15	Teori Himpunan Samar *Fuzzy Set Theory*	2 sks	Prerequisite:-
Students are able to explain the basic concepts of cryptic sets, cryptic operations, cryptic relationships and cryptic logic and are able to apply them to solve related problems.				
No. 21	MME802 16	Pembelajaran Mesin *Machine Learning*	2 sks	Prerequisite: -
This course introduces basic concepts, techniques, and algorithms in Machine Learning (ML) and their application in the context of mathematics education and learning data analysis. Students will learn supervised and unsupervised learning approaches, as well as understand how machine learning models can be used for prediction, classification, segmentation, and data-driven decision-making in educational settings. The material includes algorithms such as linear regression and logistics, decision trees, random forests, support vector machines, k-means clustering, and basic neural networks. In addition, students will be introduced to the concepts of model evaluation, overfitting, cross-validation, and feature selection. Students will also develop practical skills through the use of the Python programming language and popular libraries such as scikit-learn, pandas, and TensorFlow, to build and test machine learning models using authentic data from educational contexts. This course equips students to become educators and researchers who are adaptive to technological developments and data-driven education, and are able to design innovative solutions based on machine learning to improve the effectiveness of mathematics learning.				
No. 22	MME802 17	Persamaan Differensial *Differential Equation*	2 sks	Prerequisite: -
This course discusses the theory of ordinary differential equations (GDP) of first order and high-order, differential equations and also autonomous differential equation systems both linear and non-linear and their applications to predator prey models and disease spread. Furthermore, students were introduced to the introduction of partial differential equations (PDPs) and their applications to wave equations. In addition, mathematical software such as MATLAB, Maple, or Python is also introduced to explore solutions and visualize the results of solving differential equations.				
No. 23	MME802 18	Teori Bilangan dan Aplikasinya *Number Theory and Its Applications*	2 sks	Prerequisite:-
The Number Theory course discusses concepts related to Number Theory and applies them to related problems such as the solution of Diophantine equations, problems related to congruence, primitive roots and cryptography.				
No. 24	MME802 19	Kajian Kurikulum Pendidikan Matematika *Mathematics Education Curriculum Analysis*	2 sks	Prerequisite: -

This course examines the philosophical foundation, curriculum framework, basic principles, process standards, content standards, assessment standards, and student achievement in the mathematics curriculum implemented in several countries. From the results of the study, a comparison was then carried out so that comprehensive formulations were obtained.				
No. 25	MME802 20	Etnomatematika *Ethnomathematics*	2 sks	Prerequisite:-
In the Ethnomathematics course, preliminary research related to ethnomathematics is discussed and carried out on artifact sites in the context of mathematics learning; simulated ethnomathematics-based mathematics learning; and further research on ethnomathematics is carried out to obtain or produce articles or publications in journals.				
No. 26	MME802 21	Matematika Model *Mathematical Modelling*	2 sks	Prerequisite: -
The study of Model Mathematics lectures includes: (1) Ontology and Epistomology of Various Models: Idealistic Models consisting of Classical, Modern, and Contemporary; Realist models consisting of Classical, Modern, and Contemporary; and Modern and Contemporary Hermenistic Models. (2) Development and Implementation of Mathematical Models in the realm of mathematics education which are specifically detailed into (a) modeling and application in mathematics education; (b) modeling competencies; (c) modeling pedagogy; (d) modeling tasks; (e) modeling in high school; (f) modeling in elementary schools; (g) barriers and challenges and modeling learning; (h) PISA; (i) mathematical modeling and ICT.				
No. 27	MME802 22	Pendidikan Matematika Realistik *Realistic Mathematics Education*	2 sks	Prerequisite: -
The Realistic Mathematics Education (PMR) course discusses the history of development, theories, principles, and characteristics of PMR. This course also delves into the principles in meaningful contexts, the mathematic process, modeling rules by students, the principle of intertwining, PMR-based learning trajectories, and their implementation in schools.				
No. 28	MME802 23	Pembelajaran Matematika Berbasis Kecerdasan Buatan *Artificial Intelligence Based Mathematics Instruction*	2 sks	Prerequisite: -
This course aims to introduce the concept and application of Artificial Intelligence (AI) in the Mathematics learning process to develop students' abilities in designing and implementing effective mathematics learning using AI				
No. 29	MME802 24	Pemrograman Media Berbasis Web *Web-Based Instructional Media Programming*	2 sks	Prerequisite:-
Lecture materials include: introduction to PHP programming languages, PHP structures, variables, data types and constants, submit forms (POST/GET), arithmetic operators, assignment operators, comparison operators, logic operators, using variable arrays, conditions (IF, ELSE, SWITCH), repeatability (FOR, WHILE, FOREACH), creating functions, getting to know MySQL, creating databases, creating database tables, SQL commands, database connection with PHP, submit forms to databases, display data from databases, OOP in PHP, and use Web programming frameworks.				
No. 30	MME802 25	Matematika Sekolah Kurikulum Internasional *Mathematics Curriculum of International School*	2 sks	Prerequisite:--
This course is designed to equip students with an in-depth understanding of the structure, characteristics and approaches of mathematics learning in a range of international curricula, such as IB (International Baccalaureate), Cambridge IGCSE and A-Level, as well as other relevant international curricula. Students will examine the content, standards, pedagogical approaches, and assessment systems applied in the international curriculum, and compare them critically with the Indonesian national curriculum (Deep Learning). Learning materials include analysis of mathematical domains (algebra, calculus, geometry, statistics, and mathematical reasoning), emphasis on higher order thinking skills, inquiry and contextual approaches, and the role of technology in global mathematics learning. Students will also study sample questions and syllabus from various international programs, as well as develop an international curriculum-based learning design that is oriented towards understanding concepts and				

problem solving. Through discussions and case studies, students are expected to be able to develop adaptive and transformative learning strategies that are appropriate for diverse classroom contexts, as well as have global insights as competent educators and developers of mathematics curriculum in the era of internationalization of education.				
No. 31	MME80226	Evaluasi Program Pendidikan Matematika *Evaluation in Mathematics Education Programme*	2 sks	Prerequisite:-
The lecture materials of the Mathematics Education Program Evaluation (EPPM) studied include the evaluation of educational programs, the basics of EPPM, EPPM models, program studies, EPPM design, development of EPPM instruments and criteria, determination of evaluation sites, analysis of quantitative and qualitative data, interpretation of analysis results, analysis reports, and review of EPPM reports.				
No. 32	MME80227	Perencanaan dan Pengembangan Media Pembelajaran Matematika *Planning and Developing Mathematics Instructional Media*	2 sks	Prerequisite:-
In this course, the development of learning tools including Syllabus, lesson plans, teaching materials, media, evaluation instruments, and LKS based on the Minister of National Education related to use in high school mathematics learning is discussed. Students also learn about learning media, the role and fungi of learning media, types of learning media, planning and selection of learning media, production techniques of learning media, techniques for presenting learning media, and evaluation of learning media, which are specialized in mathematics learning. The discussions were complemented by practicum on making design and production of several types of media that matched the characteristics of students.				
No. 33	MME80228	Kajian Kurikulum dan Strategi Pembelajaran Matematika *Study on Curriculum and Mathematics Instructional Strategy*	2 sks	Prerequisite:-
This course discusses the definition of curriculum, curriculum concepts which include curriculum as lesson plans, curriculum as experiences, curriculum as learning outcomes, curriculum dimensions and curriculum functions. The foundations of the curriculum include: philosophical foundations, psychological foundations, sociological and technological foundations. The curriculum as a system, the characteristics of the system, the components of the curriculum include the components of objectives, material components, components of strategy, and evaluation components. Curriculum organization models, namely: Humanistic Model, Academic Subject Model, Social Construction Model, and Technological Model. In this course, students also observe the implementation of the mathematics curriculum in high school related to the implementation of mathematics learning models, constructivism approach, contextual approach, realistic approach, mathematics learning strategies, mathematical methods, mathematical attitudes, mathematical thinking and higher order thinking, mathematics teacher competence, and simulate various mathematics learning models in accordance with the curriculum apply, make a report, and present the results.				

Table 27. Course Code for the Master of Mathematics Education Study Program

No	Kode Code	Mata Kuliah *Courses*	Semester (SKS & ECTS)								Ket.
			1		2		3		4		
1	FMI80201	Filsafat Ilmu	2	6,46							MK Fakultas Faculty Courses
		Philosophy of Science									
2	FMI80202	Statistika	2	6,46							
		Statistics									
3	FMI80301	Metodologi Penelitian Pendidikan	3	9,69							
		Research Methodology in Education									
4	MME80201	Analisis Real	2	6,46							MK Wajib Prodi Compulsory Courses of Study
		Real Analysis									
5	MME80202	Strategi Pembelajaran Matematika Inovatif	2	6,46							
		Innovation in Mathematics Instruction Strategy									
6	MME80203	Teknologi Digital Pembelajaran Matematika	2	6,46							MK Compulsory Study Program MK Wajib Prodi
		Digital Technology in Mathematics Instruction									
7	MME80204	Daya Matematika			2	6,46					
		Mathematical Power									
8	MME80205	Geometri			2	6,46					
		Geometry									
9	MME80206	Kajian Masalah-Masalah Pendidikan Matematika	2	6,46							
		Study on Issues in Mathematics Education									
10	MME80207	Psikologi Belajar Matematika			2	6,46					
		Psychology of Learning Mathematics									
11	MME80208	Asesmen Pembelajaran Matematika			2	6,46					
		Assessment of Mathematics Instruction									
12	MME80209	Praktikum Inovasi Pembelajaran Matematika			2	6,46					
		Practicum on Innovation Mathematics-Instruction									
13	MME80310	Proposal Tesis			3	9,69					
		Thesis Proposal									

15	MME80211	Penulisan Artikel Ilmiah					2	6,46			
		Scientific Article Writing									
16	MME81001	Tugas Akhir Magister							10	32,3	
		Graduate Thesis									
14	MME80210	Statistika Matematika					2	6,46			MK Pilihan Matematika MK Mathematics Elective
		Mathematical Statistics									
17	MME80212	Aljabar Abstrak					2	6,46			
		Abstract Algebra									
18	MME80213	Analisis Numerik					2	6,46			
		Numerical Analysis									
19	MME80214	Analisis Statistika Multivariat					2	6,46			
		Multivariate Statistical Analysis									
20	MME80215	Teori Himpunan Samar					2	6,46			
		Fuzzy Set Theory									
21	MME80216	Pembelajaran Mesin					2	6,46			
		Machine Learning									
22	MME80217	Persamaan Differensial					2	6,46			
		Differential Equation									MK Pilihan Matematika
23	MME80218	Teori Bilangan dan Aplikasinya					2	6,46			
		Number Theory and Its Applications									
24	MME80219	Kajian Kurikulum Pendidikan Matematika					2	6,46			MK Pilihan Pendidikan Matematika MK Mathematics Elective MK Mathematics Education Elective
		Mathematics Education Curriculum Analysis									
25	MME80220	Etnomatematika					2	6,46			
		Ethnomathematics									
26	MME80221	Matematika Model					2	6,46			
		Mathematical Modelling									
27	MME80222	Pendidikan Matematika Realistik					2	6,46			
		Realistic Mathematics Education									
28	MME80223	Pembelajaran Matematika Berbasis Kecerdasan Buatan					2	6,46			
		Artificial Intelligence Based Mathematics Instruction									

29	MME80224	Pemrograman Media Berbasis Web					2	6,46			
		Web-Based Instructional Media Programming									
30	MME80225	Matematika Sekolah Kurikulum Internasional					2	6,46			
		Mathematics Curriculum of International School									
31	MME80226	Evaluasi Program Pendidikan Matematika					2	6,46			
		Evaluation in Mathematics Education Programme									
32	MME80227	Perencanaan dan Pengembangan Media Pembelajaran Matematika.									MK Matriculation / MK Matrikulasi
		Planning and Developing Mathematics Instructional Media									
33	MME80228	Kajian Kurikulum dan Strategi Pembelajaran Matematika									
		Study on Curriculum and Mathematics Instructional Strategy									
		Total SKS & ECTS	17	54,91	11	35,53	6	19,38	10	32,30	
			44 – 48 & 142,12 – 155,04								