CURRICULUM 2014

Bachelor of Education
in Mathematics Programme
UNIVERSITAS NEGERI YOGYAKARTA

CURRICULUM 2014

Bachelor of Education in Mathematics Programme
Faculty of Mathematics and Natural Science

A. Vision and Missions of the Bachelor of Education in Mathematics Programme

Vision of the Bachelor of Education in Mathematics Programme

In 2025 the Mathematics Education Study Program of Yogyakarta State University becomes a study program that meets international standard and creates religious, independent and intellect output.

Missions of the Bachelor of Education in Mathematics Programme

1. To create religious, independent, and intellect people through high-quality learning process
2. To support the development of mathematics education through research and scientific publication
3. To conduct community services on mathematics education as a mean to support educational practices and to improve the quality and professionalism of teachers and educational personnel
4. To build mutual relationships with national and international institutions in order to support educational practices, research and scientific publication, and community services

B. Occupational Profile

The graduate of the Mathematics Education Study Program of Yogyakarta State University are professional mathematics teachers, researchers, and developers of instructional media and resources for mathematics.

C. Programme Learning Outcomes

The programme objective is further specified into the following programme learning outcomes:

1. to demonstrate religiosity and human values in workplace and society;
2. to demonstrate responsibility, adaptability, autonomy, and leadership in accomplishing tasks;
3. to demonstrate both written and oral communication, and collaboration skills;
4. to demonstrate the ability to effectively use information and communication technology;
5. to possess profound knowledge of the concepts and principles of school mathematics and advanced mathematics;
6. to possess profound knowledge of the concepts of basic education, pedagogy, didactic mathematics, and educational research methods;
7. to apply basic concepts of education, pedagogy, didactic mathematics, and school and advanced mathematics in problem solving;
8. to design innovative mathematics instruction that utilizes a variety of strategies;
9. to conduct effective mathematics teaching and learning practices by applying pedagogical and didactical knowledge;
10. to develop innovative instructional media and resources for mathematics learning;
11. to perform classroom assessment;
12. to conduct research in mathematics learning.

D. The Structure of Curriculum

The curriculum of the Mathematics Education Study Program contains 144 credits (SKS) comprising 134 credits (SKS) for compulsary courses and 10 credits (SKS) for elective courses. For the elective courses, there are 10 credits of educational courses and 4 credits for mathematics courses.

The courses in the curriculum are categorized into:

1. Common courses at university level (code: MKU): 20 credits
2. Educational courses (code: MDK): 8 credits
3. Common courses at faculty level (code: AMF): 2 credits
4. Specific courses at study program level (code: PMA, MAA, and MAT): 114 credits

The Structure of the Curriculum
Compulsory Courses

No	Code	Course	Credits				Semester		Prerequisite
			Theory (T)	Lab work (L)	Field (F)	Total	Odd	Even	
1	MKU6301	Islamic Education*	3			3	1		
	MKU6302	Catholic Education *	3			3	1		
	MKU6303	Christian Education *	3			3	1		
	MKU6304	Budhism Education *	3			3	1		
	MKU6305	Hinduism Education *	3			3	1		
	MKU6306	Confucianism Education *	3			3	1		
2	MKU6207	Civic Education	2			2	3		
3	MKU6208	Pancasila	2			2		2	
4	MKU6209	Bahasa Indonesia	2			2	5		
5	MKU6210	Statistics	2			2	1		
6	MKU6211	English	2			2		2	
7	MKU6212	Entrepreneurship	2			2		6	
8	MKU6313	Community Service			3	3	7		
9	MKU6214	Socio-cultural Education	2			2		4	
10	MDK6201	Educational Science	2			2	1		
11	MDK6202	Educational Psychology	2			2		2	
12	MDK6203	Educational Management	2			2		4	
13	MDK6204	Socio-anthropology Education	2			2		4	
14	AMF6201	Perspective and Study on Mathematics and Natural Science	2			2	3		
15	PMA6201	ICT and Instructional Media for Mathematics	1	1		2	1		
16	PMA6202	Psychology for Learning Mathematics	2			2	3		
17	PMA6203	English for Mathematics Education 1	2			2	3		MKU6211
18	PMA6204	Mathematics Curriculum and Learning	2			2		4	
19	PMA6305	Strategies for Mathematics Learning	2		1	3		4	
20	PMA6206	Developing and Producing Instructional	1	1		2		4	

No	Code	Course	Credits				Semester		Prerequisite
			Theory (T)	Lab work (L)	Field (F)	Total	Odd	Even	
		Media for Mathematics							
21	PMA6207	Assessment of Mathematics Learning	2			2	5		MKU6204
22	PMA6308	Study of Secondary School Mathematics	3			3	5		
23	PMA6309	Design of Mathematics Instruction	3			3	5		PMA6204
24	PMA6210	Multimedia for Mathematics Learning	1	1		2	5		MAT6310
25	PMA6311	Research Methodology for Mathematics Education	3			3		6	
26	PMA6212	Mathematics Education Seminar	2			2		6	
27	PMA6213	Micro Teaching		1	1	2		6	PMA6309
28	PMA6214	Ethnomathematics	1		1	2	7		PMA6305
29	PPL6301	Educational Internship			3	3	7		PMA6213
30	PMA6616	Undergraduate Thesis	6			6		8	
31	MAA6201	Algebra	2			2	1		
32	MAA6202	Trigonometry	2			2		2	
33	MAA6303	Plane Geometry	3			3	1		
34	MAA6204	Plane Analytic Geometry	2			2	3		MAA6303
35	MAA6205	Solid Analytic Geometry	2			2		4	MAA6204
36	MAA6206	Computer Application	1	1		2	3		MAT6310
37	MAT6301	Logic and Sets	3			3	1		
38	MAT6302	Differential Calculus	3			3	1		
39	MAT6205	Number Theory	2			2		2	MAT6301
40	MAT6206	Solid Geometry	2			2		2	MAA6303
41	MAT6307	Integral Calculus	3			3		2	MAT6302
42	MAT6308	Linear Algebra	3			3	3		MAT6301
43	MAT6309	Advance Statistics	2	1		3		2	MKU6210
44	MAT6310	Algorithm and Programming	2	1		3		2	PMA6201
45	MAT6311	Abstract Algebra	3			3	5		MAT6205
46	MAT6313	Advance Calculus	3			3	3		MAT6307
47	MAT6314	Differential Equations	3			3		4	MAT6307
48	MAT6315	Probability Theory	3			3	3		MAT6301
49	MAT6317	Discrete Mathematics	3			3	5		MAT6301
50	MAT6319	Linear Programming	3			3		4	MAT6308
51	MAT6325	Real Analysis	3			3	5		MAT6313
52	MAT6228	Transformational Geometry	2			2		6	MAA6204
53	MAT6231	History of Mathematics	2			2		7	
54	MAT6332	Numerical Methods	3			3		6	MAT6310
		Total credit points (SKS)				134			

Elective Courses

No	Code	Course	Credits				Semester		Prerequisite
			Theory (T)	Lab work (L)	Field (F)	Total	Odd	Even	
55	PMA6217	English for Mathematics Education 2	2			2	7		PMA6203
56	PMA6218	Philosophy of Mathematics Education	2			2	7		
57	PMA6219	Qualitative Research	2			2	7		PMA6311
58	PMA6220	Study of International Mathematics Education	2			2	7		
59	PMA6221	Study of Elementary School Mathematics	2			2	7		
60	PMA6222	Digest of Mathematics Education	2			2	7		
61	MAA6307	Mathematical Economics	3			3		6	MAT6307
62	MAA6308	Vector Analysis	3			3		6	MAT6313
63	MAT6327	Applied Regression Analysis	2	1		3		6	MAT6309
64	MAT6334	Graph Theory	3			3		6	MAT6317
65	MAT6348	Geometrical Systems	3			3		6	MAA6303
66	MAT6361	Web Design Programming	2	1		3		6	PMA6201
		Total credit points				30			

The correlation between the courses and the learning outcomes

No	Code	Course	SKS	Learning Outcomes*											
				1	2	3	4	5	6	7	8	9	10	11	12
1	MKU6301	Islamic Studies*	3	3											
	MKU6302	Catholic Studies *													
	MKU6303	Christian Studies *													
	MKU6304	Budhism Studies *													
	MKU6305	Hinduism Studies *													
	MKU6306	Confucianism Studies *													
2	MKU6207	Civic Education	2	3	3										
3	MKU6208	Pancasila Studies	2	3	3										
4	MKU6209	Bahasa Indonesia	2			3									3
5	MKU6210	Statistics	2					3		3					3
6	MKU6211	English	2			3									
7	MKU6212	Entrepreneurship	2		3										
8	MKU6313	Community Service	3	3	3	3									
9	MKU6214	Socio-cultural Education	2	3											
10	MDK6201	Educational Science	2						3						
11	MDK6202	Educational Psychology	2						3	2		3			
12	MDK6203	Educational Management	2						3		2	3			
13	MDK6204	Socio-anthropology Education	2						3		2				
14	AMF6201	Perspective and Study	2			3									2

No	Code	Course	SKS	Learning Outcomes*											
				1	2	3	4	5	6	7	8	9	10	11	12
		on Mathematics and Natural Science													
15	PMA6201	ICT and Instructional Media for Mathematics	2				3					2	3		
16	PMA6202	Psychology for Learning Mathematics	2						3	2	2	3			
17	PMA6203	English for Mathematics Education 1	2			3									
18	PMA6204	Mathematics Curriculum and Learning	2								3	1			
19	PMA6305	Strategies for Mathematics Learning	3						3	2	3	3			
20	PMA6206	Developing and Producing Instructional Media for Mathematics	2						2			2	3		
21	PMA6207	Assessment of Mathematics Learning	2						3	2				3	
22	PMA6308	Study of Secondary School Mathematics	3					3	3	3	2	2			
23	PMA6309	Design of Mathematics Instruction	3								3	2		3	
24	PMA6210	Multimedia for Mathematics Learning	2				3				2	2	3		
25	PMA6311	Research Methodology for Mathematics Education	3												3
26	PMA6212	Mathematics Education Seminar	2			3									3
27	PMA6213	Micro Teaching	2								3	3	3	3	
28	PMA6214	Ethnomathematics	2						3	2	2				
29	PPL6301	Educational Internship	3		3	3					3	3	3	3	
30	PMA6616	Undergraduate Thesis	6			3									3
31	MAA6201	Algebra	2					3		3					
32	MAA6202	Trigonometry	2					3		3					
33	MAA6303	Plane Geometry	3					3		3					
34	MAA6204	Plane Analytic Geometry	2					3		3					
35	MAA6205	Solid Analytic Geometry	2					3		3					
36	MAA6206	Computer Application	2				3	3		3					
37	MAT6301	Logic and Sets	3					3		3					
38	MAT6302	Differential Calculus	3					3		3					
39	MAT6205	Number Theory	2					3		3					
40	MAT6206	Solid Geometry	2					3		3					
41	MAT6307	Integral Calculus	3					3		3					
42	MAT6308	Linear Algebra	3					3		3					
43	MAT6309	Advance Statistics	3					3		3					

No	Code	Course	SKS	Learning Outcomes*											
				1	2	3	4	5	6	7	8	9	10	11	12
44	MAT6310	Algorithm and Programming	3				3	3		3					
45	MAT6311	Abstract Algebra	3					3		3					
46	MAT6313	Advance Calculus	3					3		3					
47	MAT6314	Differential Equations	3					3		3					
48	MAT6315	Probability Theory	3					3		3					
49	MAT6317	Discrete Mathematics	3					3		3					
50	MAT6319	Linear Programming	3					3		3					
51	MAT6325	Real Analysis	3					3		3					
52	MAT6228	Transformational Geometry	2					3		3					
53	MAT6231	History of Mathematics	2					3		3					
54	MAT6332	Numerical Methods	3				3	3		3					

Note:

*) Code for learning outcomes:

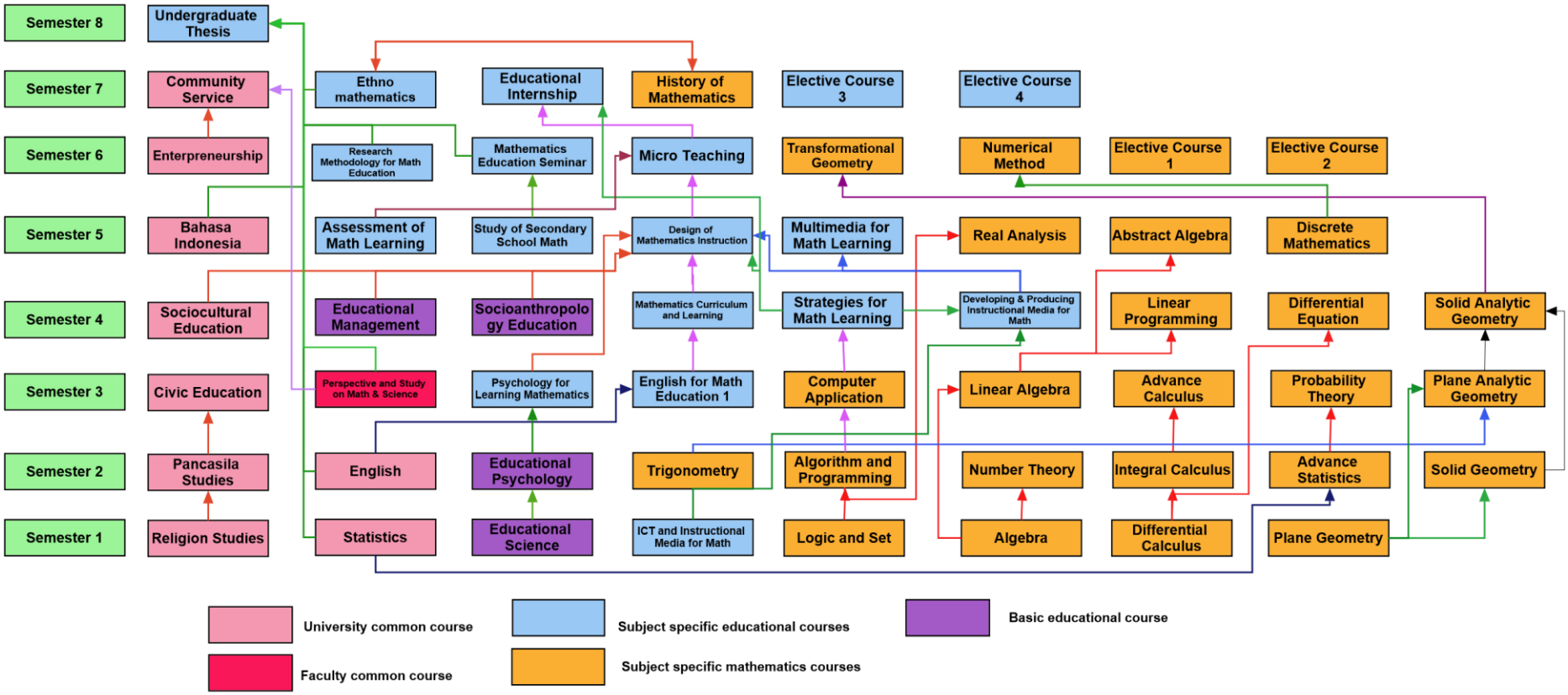
3: high relevance

2: medium relevance

1: low relevance

Programme Structure

Courses in the S1 Mathematics Education Study Program are distributed into eight (8) semesters. In general, each semester covers educational courses and mathematics courses. Map distribution of subjects in eight semesters is displayed in the following diagram:



Courses Distribution in Each Semester

In detail, the distribution of courses in each semester is presented in the following tables.

Semester 1

No	Code	Course	Credits				Prerequisite
			Theory (T)	Lab work (L)	Field (F)	Total	
1	MKU6301	Islamic Education*	3			3	
	MKU6302	Catholic Education *	3				
	MKU6303	Christian Education *	3				
	MKU6304	Budhism Education *	3				
	MKU6305	Hinduism Education *	3				
	MKU6306	Confucianism Education *	3				
2	MKU6210	Statistics	2			2	
3	MDK6201	Educational Science	2			2	
4	PMA6201	ICT and Instructional Media for Mathematics	1	1		2	
5	MAA6303	Plane Geometry	3			3	
6	MAA6201	Algebra	2			2	
7	MAT6301	Logic and Sets	3			3	
8	MAT6302	Differential Calculus	3			3	
Total						**20**	

Semester 2

No	Code	Course	Credits				Prerequisite
			Theory (T)	Lab work (L)	Field (F)	Total	
1	MKU6208	Pancasila	2			2	
2	MKU6211	English	2			2	
3	MDK6202	Educational Psychology	2			2	
4	MAA6202	Trigonometry	2			2	
5	MAT6205	Number Theory	2			2	MAT6301
6	MAT6206	Solid Geometry	2			2	MAA6303
7	MAT6307	Integral Calculus	3			3	MAT6302
8	MAT6309	Advance Statistics	2	1		3	MKU6210
9	MAT6310	Algorithm and Programming	2	1		3	PMA6201
Total						**21**	

Semester 3

No	Code	Course	Credits				Prerequisite
			Theory (T)	Lab work (L)	Field (F)	Total	
1	MKU6207	Civic Education	2			2	
2	AMF6201	Study of Mathematics and Natural Science	2			2	
3	PMA6202	Psychology of Mathematics Learning	2			2	
4	PMA6203	English for Mathematics Education 1	2			2	MKU6211
5	MAA6204	Plane Analytic Geometry	2			2	MAA6303
6	MAA6206	Computer Application	1	1		2	MAT6310
7	MAT6308	Linear Algebra	3			3	MAT6301
8	MAT6313	Advance Calculus	3			3	MAT6307
9	MAT6315	Probability Theory	3			3	MAT6301
Total						**21**	

Semester 4

No	Code	Course	Credits				Prerequisite
			Theory (T)	Lab work (L)	Field (F)	Total	
1	MKU6214	Socio-cultural Education	2			2	
2	MDK6203	Educational Management	2			2	
3	MDK6204	Socio-anthropology Education	2			2	
4	PMA6204	Curriculum and Mathematics Learning	2			2	
5	PMA6305	Strategies for Mathematics Learning	2		1	3	
6	PMA6206	Developing and Producing Instructional Media for Mathematics	1	1		2	
7	MAA6205	Solid Analytic Geometry	2			2	MAT6204
8	MAT6314	Differential Equations	3			3	MAT6307
9	MAT6319	Linear Programming	3			3	MAT6308
Total						**21**	

Semester 5

No	Code	Course	Credits				Prerequisite
			Theory (T)	Lab work (L)	Field (F)	Total	
1	MKU6209	Bahasa Indonesia	2			2	
2	PMA6207	Assessment of Mathematics Learning	2			2	PMA6204
3	PMA6308	Study of Secondary School Mathematics	3			3	
4	PMA6309	Design of Mathematics Instruction	3			3	PMA6204
5	PMA6210	Multimedia for Mathematics Learning	1	1		2	MAT6310
6	MAT6311	Abstract Algebra	3			3	MAT6205
7	MAT6317	Discrete Mathematics	3			3	MAT6301
8	MAT6325	Real Analysis	3			3	MAT6313
Total						**21**	

Semester 6

No	Code	Course	Credits				Prerequisite
			Theory (T)	Lab work (L)	Field (F)	Total	
1	MKU6212	Entrepreneurship	2			2	
2	PMA6311	Research Methodology for Mathematics Education	3			3	
3	PMA6212	Mathematics Education Seminar	2			2	
4	PMA6213	Micro Teaching		1	1	2	PMA6309
5	MAT6228	Transformational Geometry	2			2	MAA6204
6	MAT6332	Numerical Methods	3			3	MAT6310
7		Elective Course 1	3			3	
8		Elective Course 2	3			3	
Total						**20**	

Semester 7

No	Code	Course	Credits				Prerequisite
			Theory (T)	Lab work (L)	Field (F)	Total	
1	MKU6313	Community Service			3	3	
2	PMA6214	Ethnomathematics	1		1	2	PMA6305
3	PPL6301	Educational Internship			3	3	PMA6213
4	MAT6231	History of Mathematics	2			2	
5		Elective Course 3	2			2	
6		Elective Course 4	2			2	
Total						**14**	

Semester 8

No	Code	Course	Credits				Prerequisite
			Theory (T)	Lab work (L)	Field (F)	Total	
1	PMA6616	Undergraduate Thesis				6	
Total						**6**	

Elective Courses (Semester 6)

No	Code	Course	Credits				Prerequisite
			Theory (T)	Lab work (L)	Field (F)	Total	
1	MAA6307	Mathematical Economics	3			3	MAA6201
2	MAA6308	Vector Analysis	3			3	MAT6308
3	MAT6327	Applied Regression Analysis	2	1		3	MAT6309
4	MAT6334	Graph Theory	3			3	MAT6317
5	MAT6348	Geometrical Systems	3			3	MAA6303
6	MAT6361	Web Design Programming	2	1		3	PMA6201
Total						**18**	

Elective Courses (Semester 7)

No	Code	Course	Credits				Prerequisite
			Theory (T)	Lab work (L)	Field (F)	Total	
1	PMA6217	English for Mathematics Education 2	2			2	PMA6203
2	PMA6218	Philosophy of Mathematics Education	2			2	
3	PMA6219	Qualitative Research	2			2	PMA6311
4	PMA6220	Study of International Mathematics Education	2			2	
5	PMA6221	Study of Elementary School Mathematics	2			2	
6	PMA6222	Digest of Mathematics Education	2			2	
Total						**12**	

Course Description

The scope of material for each course is displayed in the following course description

No	Course Name, Description, and ELO	
1.	Course Name : Islamic Education Code/credits : MKU6301/3	
	Description	ELO
	Islam Education is 3-credits compulsory course for every Muslim student in all YSU study programs. This course is designed to strengthen their faith and piety to ALLAH The Sacred and The Mighty, as well as broadening the horizons of religious life, so that students formed with virtuous characters, philosophical thinking, rational, dynamic, and broad-minded attitude, paying attention to the demands to respect intra people in one people, and foster harmonious relationship among religious believers. Lecture activities are conducted through lectures, dialogues, and paper presentations. Evaluations are carried out through written assignments, reports, as well as presentations.	ELO 1
2.	Course Name : Catholic Education Code/ credits : MKU6302/3	
	Description	ELO
	Catholic Education course is compulsory for Catholic students in all study programs, 3 credits. This course is designed with the intention to strengthen faith and piety to Almightty God, and broaden the outlook on religious life, so that students are virtuous, think philosophically, be rational and dynamic, have a broad view, respect to other, engage in religious harmony, Christianity and its consequences, sacrament of Catholic Church, interfaith dialogue, humanitarian issues, marriage in the Catholic Church. Lecture activities are carried out using expository, dialogue, and paper presentation models. Evaluation is done through written test, assignments, reports and presentations.	ELO 1
3.	Course Name : Christian Education Code/ credits : MKU6303/3	
	Description	ELO
	Christian Education course is compulsory for Christian students in all study programs, 3 credits. This course is designed with the intention to strengthen faith and piety to Almightty God, and broaden the outlook on religious life, so that students are virtuous, think philosophically, be rational and dynamic, have a broad view, respect to other, and engage in religious harmony, community life according to biblical teaching, moral understanding in Bible and life, cultural meaning and harmony in the bible. Biblical teaching related to science, technology, art, law, and politics. Harmony among people of various religion. Lecture activities are carried out using expository, dialogue, and paper presentation models. Evaluation is done through written test, assignments, reports and presentations.	ELO 1
4.	Course Name : Buddhist Education Code/ credits : MKU6304/3	
	Description	ELO
	Buddhist Education course is compulsory for Buddhist students in all study programs, 3 credits. This course is designed with the intention to strengthen faith and piety to Almightty God, and broaden the outlook on religious life, so that	ELO 1

	students are virtuous, think philosophically, be rational and dynamic, have a broad view, respect to other, and engage in religious harmony. Buddhism Education contains the concepts and philosophies of Buddhism, the concepts of deity, human happiness, basic moral values, science and technology, politics, and universal laws in Buddhism perspective, exercises on soul development; and scientific paper writing which is in accordance with the fields of study. Lecture activities are carried out using expository, dialogue, and paper presentation models. Assessment is done through written test, assignments, reports, and presentations.	
5.	Course Name : Hindu Code/ credits : MKU6305/3	
	Description	ELO
	Hindu Education course is compulsory for Hindu students in all study programs, 3 credits with 2 credits of face to face meeting, and 1 credit of practice of Yoga Asanas, and Bhagavad Gita, Sarasamuscaya readingThis course is designed with the intention to strengthen faith and piety to Almightty God, and broaden the outlook on religious life, so that students are virtuous, think philosophically, be rational and dynamic, have a broad view, respect to other, and engage in inter religious harmony. Lecture activities are carried out using expository, dialogue, and paper presentation models. Assessment is done in the form of written test, mid-term examination (UTS), final examination (UAS), independent assignment, group assignment, as well as presentation.This subject contains the following subjects: (1) Getting to know religion; (2) Sradda; (3) Marga goes to God; (4) Manners; (5) Hindu life needs; (6) Family life; (7) Science and religion; (8) Yajna: symbolic communication; (9) Cooperation between religions; (10) Service as worship	ELO 1
6.	Course name : Konghucu Code/ credits : MKU6306/3	
	Description	ELO
	Konghucu Education course covers the urgency of religion in daily life. This course includes an understanding of the source of Confucian law, knowing the history of Confucius, being able to carry out the Sacred Path brought by the Great Teachings (Thai Rights), and the role of Confucius in the development of science and technology.	ELO 1
7.	Course name : Civic Education Code/ description : MKU6207/2	
	Description	ELO
	Civic Education course is compulsory for bachelor and diploma students, 2 credits. This course gives students basic knowledges and abilities with regard to the relationship between citizens and the state, as well as preliminary education of the defense of the country. This course discusses: (1) Citizen rights and obligations, (2) Introduction to Country Defense Education, (3) Indonesian Democracy, (4) Human Rights, (5) Archipelago insights as Indonesian Geopolitics, (6) National defense as Indonesia Geostrategy, and (7) National Politics and Strategy as the implementation of Indonesian Geostrategy.	ELO 1, ELO 2

8.	Course Name : Pancasila Studies Code/ credits : MKU6208/2	
	Description	ELO
	This lecture discusses the basis and objectives of Pancasila, Pancasila as a result of scientific thinking, Pancasila in the context of the nation's struggle history, Pancasila as a system of values and national ideology, constitution and amendments of Pancasila, and Pancasila as a paradigm of social and nation life.	ELO 1, ELO 2
9.	Course Name : Bahasa Indonesia Code/ credits : MKU6209/2	
	Description	ELO
	This course discusses language understanding, aspects of language, standard Indonesian grammar, components in communication, factors of success in communication, practices of oral communication, and is able to make a scientific paper by paying attention to the procedures for writing scientific papers which include: themes, topics, and title of essay, organization of the contents of the essay, paragraph development, effective sentences, sentence structure, spelling, vocabulary, writing format, references, and writing a bibliography.	ELO 3
10.	Course Name : Statistics Code / credits : MKU6210/2	
	Description	ELO
	This course contains a discussion of (1) the concepts of statistics and role of statistics; (2) methods for collecting and presenting data; (3) calculation and meaning of measures of central tendency, measures of variation, and measures of location; (3) the basics of probability theory; (5) random variables and their distributions; (6) sampling distribution; (7) parameter estimation; and (8) tests of hypothesis.	ELO 5, ELO 12
11.	Course Name : English Code/ credits : MKU6211/2	
	Description	ELO
	This course covers four skills in English, namely listening, reading, speaking, and writing. Students can master the rules of English grammar, communicate mathematics orally, communicate mathematics in writing, translate mathematical texts from English to Indonesian and vice versa, and rewrite mathematical texts.	ELO 3
12.	Course Name : Entrepreneurship Code/ credits : MKU6212/2	
	Description	ELO
	This lecture discusses entrepreneurship which includes the role of entrepreneurs for nation and country, the reasons for scholars to become entrepreneurs, the role of government in creating entrepreneurs, character and profiles of entrepreneurs, entrepreneurs as plenaries. The lecture also discusses techniques for developing creativity, issues, and problems encountered in entrepreneurial practice. Lecture is conducted using expository and discussion that are equipped with LCD and CTL approaches which include field studies, preparation and presentation of entrepreneurial reports, book or journal reports, and problem solving.	ELO 2

13.	Course Name : Community Services Code/ credits : MKU6313/3	
	Description	ELO
	KKN is a field course that develops student soft-skills in engaging community life and organizations, managing resources, building empathy and concerning for the community, formulating plans and implementing activities in groups and independently to empower the community in the context of improving the welfare of the community. Empowerment in this case is seen as a process of education, learning, guidance, and assistance to the community to manage its potential, find new ideas in order to increase the capacity and capability of the community to improve its welfare.	ELO 1, ELO 2, ELO 3
14.	Course Name : Socio-cultural education Code/ credits : MKU6214/2	
	Description	ELO
	This course contains material about socio-cultural in the perspective of general education. This course discusses about nature and scope of basic socio-cultural education, human traits as individual, social, and cultural beings. Dynamics and dilemma of social interaction. The nature of civilization, dynamics of global civilization. The nature of human diversity in socio-cultural dynamics. Nature and function of value, moral, and laws. The nature and meaning of science, technology, art for humans, environment for humans. The issues on cross-culture and nation.	ELO 1
15.	Course Name : Educational Science Code/ credits : MDK6201/2	
	Description	ELO
	This course is compulsory course, with 2 credits. This course seeks to stick ideas and disseminate educational science to take part in educating and enlightening students. Education is the process of exploring all the potentials, abilities, and capacities of people through media that are arranged in such a way, and are used by humans to help others or themselves in achieving their intended goals. This course contains the following material: (1) Basic, functions, goals, and principles of education; (2) Urgency to understand human nature; (3) The meaning of education and educational boundaries; (4) Education as a science and as a system; (5) Students and educators; (6) The content, methods, tools and educational environment; (7) Lifelong education; (8) Ki Hadjar Dewantara: foundation of national education.	ELO 6
16.	Course Name : Educational Psychology Code/ credits : MDK6202/2	
	Description	ELO
	Educational psychology is the application of psychological theories to study development, learning, motivation, teaching and problems that arise in the world of education. Educational psychology as a systematic study of the processes and psychological factors associated with human education. This course contains the	ELO 6

	following material: The basic concepts of educational psychology, tasks and development theory, individual differences, learn and learning, learning theory, evaluation of learning outcomes, diagnostic learning difficulties, and their application in the field of education.	
17.	Course Name : Educational Management Code/ credits : MDK6203/2	
	Description	ELO
	This course is compulsory course with 2 credits. This course contains the following material: (1) Education concepts and management; (2) Organization of educational institutions; (3) Curriculum management; (4) Management of learner; (5) Management of educational staff; (6) Management of educational facilities; (7) Management of educational funding; (8) Management of educational institution affair with community; (9) Management of educational administration; (10) Leadership and supervision of education	ELO 6
18.	Course Name : Socio-Anthropology Education Code/ credits : MDK6204/2	
	Description	ELO
	This course sees education as a socio-cultural process. In this course, the concepts, socio-cultural methodologies in education will be discussed, and various educational cases and problems are presented. This course also provides basic knowledge about the importance of climate, approaches, and socio-cultural influences, both from school and from outside the school (family, peer groups, nation-society, and mass media) in a multicultural society (pluralistic) and education that is most suitable for humans (anthropos) in realizing the current and future goals of Indonesia's education.	ELO 6
19.	Course Name : Perspective and Study on Mathematics and Natural Science Code/ credits : AMF6201/2	
	Description	ELO
	This course discusses the basic methods of Mathematics and Natural Science (scientific method) in solving problems and the way / technique of arranging conclusions based on the correct rules of reasoning (mathematical logic). It also covers the basic concepts of science and its latest developments.	ELO 2
20.	Course Name : ICT and Mathematics Learning Media Code/ credits : PMA6201/1	
	Description	ELO
	ICT and Mathematics Learning Media discusses computer systems, the use of application programs and the development of conventional mathematics learning media, as well as the introduction of interactive multimedia, video tutorials, e-learning and mobile learning.	ELO 4, ELO 10

21.	Course Name : Psychology for Learning Mathematics Code/ credits : PMA6202/2	
	Description	ELO
	This course discusses the application of psychology to learning mathematics, the formation of mathematical concepts, ideas from schemes, types of intelligence, types of imagery, factors that influence the learning process of mathematics, various theories of learning mathematics, how to diagnose difficulties in learning mathematics, and how relieve the difficulty of learning mathematics.	ELO 6, ELO 7, ELO 8
22.	Course Name : English for Mathematics Education I Code/ credits : PMA6203/2	
	Description	ELO
	This course aims to provide a review and exercises for students to use English especially in mathematics education. The course includes literacy reading, understanding and improving the vocabulary in mathematics content, classroom language and also preparing scenario for mathematics learning.	ELO 3
23.	Course Name : Mathematics Curriculum and Learning Code/ credits : PMA6204/2	
	Description	ELO
	The topics discussed in this course are understanding the curriculum, the concept of the curriculum which includes the curriculum as a lesson plan, curriculum as experience, curriculum as a learning outcome, curriculum dimensions and curriculum functions. The curriculum foundation includes philosophical psychological, sociological and technological foundation. Curriculum as a system, characteristics, curriculum components include the objective, material, strategic, evaluation component. Curriculum organization models, namely: a) Humanistic Model b) Academic Subject Model c) Social Construction Model d) Technological Model. Curriculum development approaches and types of curriculum organization, the nature, types, models, and functions of curriculum evaluation, curriculum development evaluation procedures. The curriculum concepts and principles that are being used in secondary schools in Indonesia is 2013 curriculum. This course also discusses learning models, evaluation system and learning principles that are in line with the 2013 curriculum and its education standards. Such as; principle of activity, efficiency, effectiveness, individual, direct involvement, motivational principle, principle of strengthening the principle of cooperation, etc., components of objectives, material, strategies /methods, media, and evaluation, learning design concepts, learning design models, syllabus and lesson plan, the nature of curriculum innovation.	ELO 8, ELO 9
24.	Course Name : Strategies of Mathematics Learning Code/ credits : PMA6305/2	
	Description	ELO
	In this course, an introduction to mathematics philosophy, philosophy of mathematics education, philosophy of mathematics learning, the nature of school mathematics and mathematics, mathematics learning theories and paradigms, mathematical learning strategies, mathematical learning models, mathematical	ELO 6, ELO 7, ELO 8, ELO 9

	thinking, mathematical methods, mathematics attitude, higher order thinking, mathematics teacher competence in relation to the 2013 curriculum, constructivism approach, contextual approach, realistic approach, and simulating various models of mathematics learning.	
25.	Course Name : Developing and Producing Instructional Media for Mathematics Code/ credits : PMA6206/1	
	Description	ELO
	In general, this course discusses concepts: mathematics learning media, mathematics learning resources, mathematics teaching aids; foundation for the use of mathematics learning media; function and role of mathematics learning media; types and characteristics of mathematics learning media; the selection and use of mathematics learning media; development of mathematics learning media (teaching aids, student activity sheets, modules), production techniques/making of mathematics learning media. Specifically this course discusses the development of instructional media: numbers, algebra, geometry and measurement, trigonometry, probability and statistics, logic and sets, calculus, which are associated with school mathematics learning in line with the applicable mathematics curriculum.	ELO 7, ELO 10
26.	Course Name : Assessment for Learning Mathematics Code/ credits : PMA6207/2	
	Description	ELO
	This course discusses: basic concepts in educational assessment; instrument validity and reliability; forms of test and non-test instruments; planning, compilation and development of test and non-test instruments for mathematics learning, include attitudes, knowledge, and skills aspects; theoretically and empirically (manuals and computer program). To achieve course objectives, teaching and learning activities are conducted through expository, presentation, and discussion. Students are given group and individual assignments to practice the preparation and development of test instruments, and then analyze it (test items) which relevant to or can support their final project.	ELO 7, ELO 11
27.	Course Name : Study on Secondary School Mathematics Code/ credits : PMA6308/3	
	Description	ELO
	This course discusses mathematical topics that studied in secondary schools. The topics are: intuition and proof, the basics of number theory, equation theory, measurement (area and volume), triangles, trigonometry, real number systems, functions and modeling, geometric transformation, data analysis and probability, mathematical understanding and mathematical connections. In general, the focus of this course is to relate mathematics in higher education and mathematics in high school, such that students have adequate mathematical knowledge and skills. Furthermore, by discussing various mathematical topics in this course students are expected to be able to better understand the learning trajectory of various topics.	ELO 5, ELO 6

28.	Course Name : Design of Mathematics Instruction Code/ credits : PMA6309/3	
	Description	ELO
	This course contains the concept of instructional design and its application which includes its basic concepts, approach to learning, learning models according to Dick and Carrey, learning objectives, evaluation design of learning outcomes, learning activities design according to a model / strategy / approach to learning.	ELO 7, ELO 8, ELO 11
29.	Course Name : Multimedia for Mathematics Learning Code/ credits : PMA6210/1	
	Description	ELO
	This course provides the basis knowledge of visual communication design for the design and development of mathematics multimedia-interactive-based learning. This include computer and mobile devices with software. Topics in this course are components of visual communication design, introduction of software development, and working system of computer and mobile devices.	ELO 4, ELO 7, ELO 10
30.	Course Name : Research Methodology for Mathematics Education Code/ credits : PMA6311/3	
	Description	ELO
	This course covers the study of mathematical education research methodologies which include (1) identification of educational research domains, (2) types of research, (3) identification of research problems, (3) identification of research variables, (4) preparation of theoretical studies, frameworks thinking, and research hypotheses, (5) sampling techniques, (6) development of indicators and research instruments, (7) evidence of validity and reliability estimation, (8) data analysis techniques, and (9) preparation of research proposals.	ELO 12
31.	Course Name : Mathematics Education Seminar Code/ credits : PMA6212/2	
	Description	ELO
	This course includes the study of ideas / thoughts and writing scientific papers in the field of mathematics education which include: (1) identification of ideas / thoughts in the field of mathematics education, (2) concept and structure of scientific papers, (2) Ethics and rules of scientific writing (citation and reference writing), (3) introduction, (4) method, (5) results and discussion, (6) conclusions and suggestions, (7) titles and abstracts, and (8) presentation of scientific papers.	ELO 3, ELO 12
32.	Course Name : Micro Teaching Code/ credits : PMA6213/ 2	
	Description	ELO
	This course contains basic teaching skills, plans' development in doing either, learning and practice restrictively or integrally	ELO 8, ELO 9, ELO 11

33.	Course Name : Ethnomathematics Code/ credits : PMA6214/1	
	Description	ELO
	The course is related to the willingness, attitude, knowledge, skill and experience of the reviewing and developing mathematics education based on multi ethnic and culture. This course discusses the nature, rationale and benefits of ethnomathematics; dimensions, perspectives and position of ethnomathematics; subject, object, approach and method; theoretical studies, research approaches and results in ethnomathematics; understanding, identification and preliminary research sources of ethnomathematics development in the form of artifacts, literary/cultural works and traditions/social interactions in the context of mathematics learning.	ELO 6, ELO 8
34.	Course Name : Educational Internship Code/ credits : PPL6301/3	
	Description	ELO
	This course covers basic teaching skills, development of lesson plans, learning and practice restrictively or integrally.	ELO 2, ELO 3, ELO 8, ELO 9, ELO 10, ELO 11
35.	Course Name : Undergraduate Thesis Code/ credits : PMA6616/6	
	Description	ELO
	This course covers the development of proposals, preparation of instruments, implementation, and preparation of research reports as well as presenting and communicating according to applicable scientific principles. Recent topic in Mathematics and its application are discussed with the supervisor.	ELO 3, ELO 12
36.	Course Name : Algebra Code/credits : MAA6201/2	
	Description	ELO
	This course discusses the scope and conceptual definitions of algebraic components, polynomials, algebraic fractions, exponents, logarithms, root forms and absolute values, understands various forms of equations and algebraic inequalities, graphs algebraic functions, arithmetic series, and geometric series.	ELO 5
37.	Course Name : Trigonometry Code/credits : MAA6202/2	
	Description	ELO
	This course discusses understanding of angles, and quantities used in measurements, definitions of trigonometry functions and their expansion for non-singular angles, various equations and inequalities of Trigonometry functions, various graphs of simple trigonometry functions, summations and multiplication of two trigonometry functions are simple and able to apply them to related problems.	ELO 5

38.	Course Name : Plane Geometry Code/credits : MAA6303/3	
	Description	ELO
	This course discusses the basic objects in geometry, angle, parallelism, triangle, quadrilateral, congruence, similarity, geometric construction, area and perimeter, polygons, Pythagorean Theorem, and circle.	ELO 5
39.	Course Name : Plane Analytic Geometry Code/credits : MAA6204/2	
	Description	ELO
	This course includes geometric objects in the plane, namely points, lines, circles and conic sections (ellipse, hyperbola, parabola) discussed using algebraic language.	ELO 5
40.	Course Name : Solid Analytic Geometry Code/credits : MAA6205/2	
	Description	ELO
	This course discusses geometric elements, surface and their relationships in three dimensions (3-dimensional Coordinate System, Plane, Line, Sphere, Paraboloida, Ellipsoida, and Hyperboloida) using algebraic language.	ELO 5
41.	Course Name : Computer Application Code/credits : MAA6206/1	
	Description	ELO
	This course is about introduction of mathematical software - both commercial and free, comparison of features of mathematical software, and the use of several free mathematical software to solve mathematical problems and processing mathematical documents.	ELO 4, ELO 5
42.	Course Name : Logic and Sets Code/credits : MAT6301/3	
	Description	ELO
	This course discusses about statements, truth tables, tautology, contradiction, contingency, quantifier, arguments, definition of a set, operations on a set, relations, equivalence relations, functions, cardinality of a set.	ELO 5
43.	Course Name : Differential Calculus Code/credits : MAT6302/3	
	Description	ELO
	The course contains discussion on concepts of real number systems, coordinate systems, functions, limit functions and continuity, derivative functions, minima and maxima problems, limits at infinity, infinite limits, graphs of equation and the mean value theorems for derivatives.	ELO 5

44.	Course Name : Number Theory Code/credits : MAT6205/2	
	Description	ELO
	This course contains the properties of integers and relations. Topics covered include mathematical induction, relation of division, the greatest common divisor (GCD), The Least Common Multiplication (LCM), base number, prime number, single factorization, congruence and its application, linear congruence, Fermat and Wilson's theorem, arithmetic functions, Euler theorems, primitive roots and indexes.	ELO 5
45.	Course Name : Solid Geometry Code/credits : MAT6206/2	
	Description	ELO
	This course discusses elements of space and their relations, drawing geometrical objects, perpendicularity, angle, distance, polyhedrons, cylinder, cone, and sphere.	ELO 5
46.	Course Name : Integral Calculus Code/credits : MAT6307/3	
	Description	ELO
	The course contains discussion on Indefinite integral, definite integral, fundamental theorem of integral, applications of the integral, transcendent function, integration techniques, indeterminate forms, and improper integrals.	ELO 5
47.	Course Name : Linear Algebra Code/credits : MAT6308/3	
	Description	ELO
	This Linear Algebra course discusses the concepts of matrices and matrix operations, the rules of matrix operation, types of matrices, elementary matrices and inverse matrix methods, inverse matrix operations, systems of linear equations, Gauss elimination, and Gauss-Jordan elimination, determinant function, calculates determinant by line reduction, properties of determinant functions, cofactor expansion and Cramer rules, linkages between homogeneous linear equation, inverse matrix and determinant, application of inverse matrix on cryptography, vectors (analytic), norms vector, the point projection, cross product on R^2 and R^3, and euclide-n space.	ELO 5
48.	Course Name : Advanced Statistics Code/credits : MAT6309/2	
	Description	ELO
	This course discusses parameter estimation for two populations, hypotheses testing for two populations and more than two populations, one-way variance analysis and multiple comparison tests, linear regression, and several hypothesis testing related to nonparametric statistics.	ELO 5

49.	Course Name : Algorithm and Programming Code/credits : MAT6310/2	
	Description	ELO
	This course discusses about problem solving (mathematics), preparation and presentation of the steps to solve it, and programming using the Pascal Programming Language. The topics studied include: (1) problem solving and solution, (2) algorithms and how they are presented, (3) the structure of Pascal language and data types, (4) input-output, variable, and arithmetic operations commands, (5) logical operators and IF-THEN-ELSE, and CASE-OF decision making structures, (6) looping iterations and recursions, (7) looping structures FOR-TO-DO, WHILE-DO, and REPEAT-UNTIL, (8) use of functions - mathematical functions, (8) dimensioned / indexed (array) data types, (9) modular programming: procedures and functions, (10) recording data types (records),(complex data structures), and (11) text data types (text).	ELO 4, ELO 5
50.	Course Name : Abstract Algebra Code/credits : MAT6311/3	
	Description	ELO
	This course contains basic concepts of group, subgroup, permutation group, cyclic group, coset, Lagrange theorem, normal subgroup, factor group, group homomorphism and the main group homomorphism theorem.	ELO 5
51.	Course Name : Advance Calculus Code/credits : MAT6313/3	
	Description	ELO
	This course discusses the sequences, infinite series, convergence tests of the sequences and series, divergence tests of the sequences and series, Taylor series, functions of two variables, limit and continuity of functions of two variables, derivatives of functions of two variables, directional derivatives, maximum and minimum, the chain rule, Lagrange method, multiple integrals in Cartesian as well as in polar coordinates, the applications of multiple integrals in finding the volume of a solid or the area of a surface.	ELO 5
52.	Course Name : Differential Equations Code/credits : MAT6314/3	
	Description	ELO
	The course contains discussion on definition and solution of differential equation, exact solution of first order equation, method of grouping, integrating factor, separable equation, homogeneous equation, linear equation, Bernoulli equation, special integrating factor, special transformation, homogeneous equation with constant coefficients, undetermined coefficients method, variation of parameters, and Cauchy-Euler equation.	ELO 5

53.	Course Name : Probability Theory Code/credits : MAT6315/3	
	Description	ELO
	The course is more focused on probability concepts. The materials of probability theory are combinatorial methods, probability, random variables and their distributions, joint distributions, properties of random variables, and functions of random variables.	ELO 5
54.	Course Name : Discrete Mathematics Code/credits : MAT6317/3	
	Description	ELO
	This course discusses about the concepts of thinking with mathematical logic, theory and relation and induction of mathematics, enumeration principles, permutations, combinations, generating functions, recurrence relation and introduction to graph theory and its application in several fields.	ELO 5
55.	Course Name : Linear Programming Code/credits : MAT6319/3	
	Description	ELO
	The course contains discussion on modeling real problems into the linear programming model. Furthermore, the definition of the convex set, the feasible set, the extreme point, the optimum solution in hyper plane will be discussed. Solving linear programming problems with graphical methods and primal simplex methods, simplex methods with common constraints, two-stage simplex method, duality, simplex method theory, sensitivity analysis, some special occurrences of linear programming problems, integer programming and transportation problem.	ELO 5
56.	Course Name : Real Analysis Code/credits : MAT6325/3	
	Description	ELO
	This course contains some foundations on mathematical proofs, real number systems ($\mathbb{R}$), sequences and series, some concepts of sets topology, and functions. Firstly, it will be given the foundations, such as; reviews on bijective functions, mathematical induction, countable and uncountable sets. Secondly, the subject of the real number system includes: rational and irrational numbers, the order properties of $\mathbb{R}$, and the completeness property of $\mathbb{R}$. The subject sequences and series include: limit sequence, monotonous sequence, subsequences, Cauchy criteria, and several properties of series. Finally, the subject of several topological concepts includes: open set, closed set, and compact set. And, at the end of the course we discussed the limit of functions, piecewise and uniform continuity of functions.	ELO 5

57.	Course Name : Transformational Geometry Code/credits : MAT6228/2	
	Description	ELO
	This course studies the concepts and principles of isometric transformation and similarity transformation onto the plane synthetically, analytically and using matrices. Isometric transformation includes translation, reflection, rotation, and glide reflection, while the similarity transformation includes dilation, stretch, and shear. It's also discussed the composition of these transformations.	ELO 5
58.	Course Name : History of Mathematics Code/credits : MAT6231/2	
	Description	ELO
	In general, the subject of Mathematics History is intended to provide insight into the development of mathematical concepts from several civilizations. In this course we study about: mathematical systems; Babylonian and Egyptian numerical, Euclid and His Work (The Elements); Pythagoras and Descartes; Greek Mathematics; Chinese Mathematics; Indian Mathematics; Islamic Mathematics; Medieval European Mathematics, Algebraic History; Non-Euclidean Geometry Development; Calculus Development; and Development of Statistics and Probability Theory.	ELO 5
59.	Course Name : Numerical Methods Code/credits : MAT6332/3	
	Description	ELO
	The course discusses about errors in numerical approximation, numerical system solving of linear equations, numerically almost non-linear root equations, numerical interpolation, degradation and integration, and numerical solving of ordinary differential equations (initial value problems). Some numerical methods for solving mathematical problems are introduced in this course. There is a practical activity using a computer program (Euler Maths Toolbox, Octave, SCILAB, or MATLAB, etc.) to implement algorithms and solve numerically related mathematical problems.	ELO 4, ELO 5
60.	Course Name : English for Mathematics Education 2 Code/credits : PMA6217/2	
	Description	ELO
	This course facilitates students to review the latest English mathematics books and articles published in reputable international journals. The books and articles can be used as the reference in writing scientific papers for students' final essay. Students are facilitated to present the scientific papers in English. In addition, students also get the knowledge and practice of IELTS to obtain scholarships abroad.	ELO 3

61.	Course Name : Philosophy of Mathematics Education Code/credits : PMA6218/2	
	Description	ELO
	The lesson covers the indepth study of the nature, the method and the value of mathematics and mathematics education. The material objects the philosophy of mathematics consist of the history of mathematics, the foundation of mathematics, the concept of mathematics, the object of mathematics, the method of mathematics, the development of mathematics, the hierarchy of mathematics and the value of mathematics. The material objects of the philosophy of mathematics education consists of the ideology and the foundation of mathematics education as well as the nature, the method and the value of education, curriculum, educator, learner, aim of teaching, method of teaching, teaching facilities, teaching assessment.	ELO 6
62.	Course Name : Qualitative Research Code/credits : PMA6219/2	
	Description	ELO
	This course discusses differentiate qualitative and quantitative research, formulate problems in qualitative research, conduct theoretical studies from various library sources, utilize suitable data collection techniques in qualitative research, develop research instruments, conduct data analyses in qualitative research using many models, report and review research results, conduct mini qualitative research in mathematics education.	ELO 12
63.	Course Name : Study of International Mathematics Education Code/credits : PMA6220/2	
	Description	ELO
	This course elaborates the education systems, the learning curriculum, the learning strategies, and the evaluation systems in several countries, either the developed and and the developing countries. This subject also discusses and analyzes the international surveys' result on the students' mathematical abilities such as TIMSS and PISA in several countries. The results of the study will be synthesized and analyzed to improve the mathematics education system in Indonesia.	ELO 6, ELO 7, ELO 8
64.	Course Name : Study of Elementary School Mathematics Code/credits : PMA6221/2	
	Description	ELO
	This course provides skills and ability to the students in solving mathematical problems on number sense topics (including: numbers, operations and characteristics of numbers, fractions, decimals, percent, and fractional count operations), ratio , proportion, least common multiple-greatest common divisor, algebra, statistics, opportunities, geometric shapes, measurements, and transformation.	ELO 7, ELO 8

65.	Course Name : Digest of Mathematics Education Code/credits : PMA6222/2	
	Description	ELO
	In this course, students are facilitated to study the latest issues in mathematics education, use the knowledge developed to design learning activities and to write scientific papers that can support the preparation of the final project.	ELO 7, ELO 8
66.	Course Name : Mathematical Economics Code/credits : MAA6307/3	
	Description	ELO
	This course contains a discussion of returns or interest rates, annuity models, special topics on micro and macroeconomic mathematics, and basic accounting principles.	ELO 5
67.	Course Name : Vector Analysis Code/credits : MAA6308/3	
	Description	ELO
	This course contains an introduction to vectors, vectors functions, vectors functions derivative, integral, and coordinate systems. The topics in vectors introduction are definition, notation, component, and various kinds of vectors. The introduction of vectors also discusses the operations of vectors (sums, scalar products, and cross products) and the vectors properties. The vectors functions chapter divide into two sub chapter, those are Linear vector functions and nonlinear vector functions. The subject in derivative of vectors functions are the definition, the geometrical and physical meaning of vector function derivative, the properties of vector function derivative, the definition of some operator, and vector rotation. Meanwhile, the topics in integral are line integral, surface integral, volume integral, Green Theorem, Gauss Theorem, and Stokes Theorem. And, at the end of the course we discussed the topics in coordinate systems, such as; coordinate transformation, orthogonal linear curve, vector identity, divergence, orthogonal coordinate system, tube coordinate, and spherical coordinate.	ELO 5
68.	Course Name : Applied Regression Analysis Code/credits : MAT6327/2	
	Description	ELO
	This course discusses correlation and linear regression, regression with qualitative independent variables, polynomial regression, best regression selection, residual analysis and several other correlation analyzes and their application.	ELO 5
69.	Course Name : Graph Theory Code/credits : MAT6334/3	
	Description	ELO
	This course study about the concepts in graph theory that is graph definition, graphical presentation technique, graph types, connectedness, tree graph, generator tree graph, algorithm to determine minimal plant grass tree, planarity and technique to determine planarity of a graph, and decomposition in the graph.	ELO 5

70.	Course Name : Geometrical Systems Code/credits : MAT6348/3	
	Description	ELO
	This course discusses Geometry as a deductive system, consisting of Ordered Geometry, Affine Geometry, Absolute Geometry, Hyperbolic Geometry, Elliptic Geometry, which is compared with Euclidean Geometry.	ELO 5
71.	Course Name : Web Design Programming Code/credits : MAT6361/2	
	Description	ELO
	This course is to lay the foundation for developing web applications with static and dynamic content documents by combining HTML, CSS, JavaScript, PHP-My SQL and using CMS to build enterprise web pages.	ELO 5, ELO 10