

CURRICULUM 2014



Bachelor of Science In Mathematics
Faculty of Mathematics and Natural Sciences
Universitas Negeri Yogyakarta

2014 CURRICULUM OF BACHELOR OF SCIENCE IN MATHEMATICS

Vision:

To become a bachelor of science in mathematics programme that is excellent in mastering, applying, and developing mathematical science, and able to yield human resources who hold pious, autonomous, and intellectual values.

Mission:

1. Facilitating graduates with the ability to compete in the global era and with qualification to continue their studies to a higher level
2. Conducting research to develop mathematical science and its application significant for the development of science and technology
3. Conducting community service for disseminating and applying mathematical sciences
4. Implementing good and clean governance and establishing mutually-beneficial collaboration both domestic and international, to support the quality of education and research in mathematics, and also the community service activities.

Programme Learning Outcomes (PLO):

Attitude

PLO 1	To demonstrate faith in the Almighty God and have a nationalism spirit based on Pancasila.
PLO 2	To appreciate the diversity of cultures, views, religions, and beliefs, as well as the others' opinions and original invention.

Generic Skills

PLO 3	To think critically, creatively, innovatively, and systematically in the development of science and technology, both independently and in groups;
PLO 4	To disseminate mathematical ideas both written and orally based on honesty.

Knowledge

PLO 5	To deeply master the fields of mathematics including analysis, algebra, geometry, statistics, applied mathematics, and computer science for the basis of self-development in work and further studies.
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Specific Skills

PLO 6	To explore, generalize, abstract, and prove the properties, lemma(s), and simple mathematical theorem(s) using logical reasoning.
PLO 7	To formulate, solve, and interpret mathematical models from various fields.
PLO 8	To apply algorithms by using accurate and efficient mathematical rules to create high-quality software systems by noticing the aspects of ethics, law and information security;
PLO 9	To analyze information and data in order to make accurate and scientific decisions.
PLO 10	To use the development of mathematics as well as information and communication technology to become lifelong learners.

Occupation profile of BSM UNY's Graduate

No	Occupational profile	Explanation
1.	Academician	Graduates of BSM UNY have strong knowledge background to continue their study in masters or become a lecturer
2.	Research assistant	Graduates of BSM UNY able to assist a research project
3.	Data analyst	Graduates of BSM UNY could become data consultant or data analyst in a research project
4.	Practitioner/ professional staff	Graduates of BSM UNY could become practitioner or professional staff in the field of industry, services, bank, and government.
5.	Software developer	Graduates of BSM UNY able to develop software which could be used to solve the community's problems.

A. COMPULSORY COURSES

No	Code	Courses	Detail Credit				Semester		Prerequisite (Code)
			T	P	F	S	Odd	Even	
1	MKU6301	Islam Education	3			3	1		
	MKU6302	Catholic Education	3			3	1		
	MKU6303	Christianity Education	3			3	1		
	MKU6304	Buddhism Education	3			3	1		
	MKU6305	Hinduism Education	3			3	1		
	MKU6306	Confucianism Education	3			3	1		
2	MKU6207	Civic Education	2			2	1		
3	MKU6208	Pancasila	2			2		2	
4	MKU6209	Indonesian Language	2			2	5		
5	MKU6210	Statistics	2			2	1		
6	MKU6211	English	2			2	1		
7	MKU6212	Entrepreneurship	1		1	2		6	
8	MKU6313	Community Services			3	3	7		≥100 Credits
9	MKU6214	Social Cultural Education	2			2		2	
10	AMF6201	Insight and study of Mathematics and Natural Science	2			2		4	
11	MAT6301	Logic and Set Theory	3			3	1		
12	MAT6302	Differential Calculus	3			3	1		
13	MAT6203	Plane Geometry	2			2	1		
14	MAT6204	Information and Communication Technology	1	1		2	1		
15	MAT6205	Number Theory	2			2		2	MAT6301
16	MAT6206	Solid Geometry	2			2		2	MAT6203
17	MAT6307	Integral Calculus	3			3		2	MAT6302
18	MAT6308	Linear Algebra	3			3		2	MAT6301
19	MAT6309	Advanced Statistics	2	1		3		2	MKU6210
20	MAT6310	Algorithm and Programming	2	1		3		2	MAT6204
21	MAT6311	Abstract Algebra	3			3	3		MAT6205
22	MAT6312	Analytic Geometry	3			3	3		MAT6206

No	Code	Courses	Detail Credit				Semester		Prerequisite (Code)
			T	P	F	S	Odd	Even	
23	MAT6313	Advanced Calculus	3			3	3		MAT6307
24	MAT6314	Differential Equations	3			3	3		MAT6307
25	MAT6315	Probability Theory	3			3	3		MAT6301
26	MAT6316	Computer Application	2	1		3	3		MAT6310
27	MAT6317	Discrete Mathematics	3			3	3		MAT6301
28	MAT6318	Advanced Abstract Algebra	3			3		4	MAT6311
29	MAT6319	Linear Programming	3			3		4	MAT6308
30	MAT6320	Partial Differential Equations	3			3		4	MAT6314
31	MAT6321	Information System and Database	2	1		3		4	MAT6310
32	MAT6322	Mathematical Modeling	3			3		4	MAT6314
33	MAT6323	Mathematical Statistics	2	1		3		4	MAT6315
34	MAT6224	English for Mathematics	2			2	5		
35	MAT6325	Real Analysis	3			3	5		MAT6313
36	MAT6326	Advanced Linear Algebra	3			3	5		MAT6308
37	MAT6327	Applied Regression Analysis	2	1		3	5		MAT6309
38	MAT6228	Transformational Geometry	2			2	5		MAT6312
39	MAT6329	Operation Research	3			3	5		MAT6319
40	MAT6330	Complex Analysis	3			3	5		MAT6313
41	MAT6231	History of Mathematics	2			2		6	
42	MAT6332	Numerical Methods	2	1		3		6	MAT6310
43	MAT6233	Advanced Real Analysis	2			2		6	MAT6325
44	MAT6234	Graph Theory	2			2		6	MAT6317
45	MAT6335	Mobile Device Programming	2	1		3		6	MAT6310
46	PKL6302	Fieldwork Practice			3	3	7		≥100 credits
47	MAT6336	Applied Multivariate Statistics	2	1		3	7		MAT6309
48	MAT6237	Mathematics Seminar	2			2	7		≥70 credits
49	MAT6638	Undergraduate Thesis	6			6		8	≥110 credits
Credit Total			116	10	6	132			

B. ELECTIVE COURSES

No	Code	Courses	Detail Credit				Semester		Prerequisite (Code)
			T	P	F	S	Odd	Even	
		Interest Field: Algebra							
1	MAT6339	Applied Linear Algebra	3			3		6	MAT6326
2	MAT6340	Fuzzy Set Theory	3			3		6	MAT6301
3	MAT6341	Cryptography	3			3		6	MAT6205
4	MAT6342	Coding Theory	3			3	7		MAT6318
5	MAT6343	Module Theory	3			3	7		MAT6318
6	MAT6344	Semigroup Theory	3			3	7		MAT6311
		Interest Field : Analysis and Geometry							
7	MAT6345	Introduction to Topology	3			3		6	MAT6325

No	Code	Courses	Detail Credit				Semester		Prerequisite (Code)
			T	P	F	S	Odd	Even	
8	MAT6346	Introduction to Measure Theory and Lebesgue Integral	3			3	7		MAT6326
9	MAT6347	Introduction to Functional Analysis	3			3		6	MAT6325
10	MAT6348	Geometry Systems	3			3		6	MAT6203
11	MAT6349	Fractal Geometry	3			3	7		MAT6325
12	MAT6350	n-Dimensional Geometry	3			3	7		MAT6312
		Interest Field : Applied Mathematics							
13	MAT6351	Introduction to Dynamical System	3			3		6	MAT6214
14	MAT6352	Engineering Mathematics	3			3		6	MAT6214
15	MAT6353	Actuarial Mathematics	3			3	7		MAT6315
16	MAT6354	Initial and Boundary Value Problems	3			3	7		MAT6314
17	MAT6355	Introduction to Systems Theory	3			3	7		MAT6314
18	MAT6356	Optimization Theory	3			3		6	MAT6319
		Interest Field : Computer							
19	MAT6357	Object Oriented Programming	2	1		3	7		MAT6310
20	MAT6358	Artificial Intelligence	2	1		3	7		MAT6310
21	MAT6359	Data Mining	2	1		3	7		MAT6309, MAT6310
22	MAT6360	Computer Network	2	1		3		6	MAT6204
23	MAT6361	Web Design Programming	2	1		3		6	MAT6204
24	MAT6362	Digital Image Processing	2	1		3		6	MAT6316
		Interest Field : Statistics							
25	MAT6363	Categorical Data Analysis	2	1		3	7		MAT6309
26	MAT6364	Nonparametric Statistics	2	1		3		6	MKU6210
27	MAT6365	Time Series Analysis	2	1		3		6	MAT6327
28	MAT6366	Experimental Design	2	1		3	7		MAT6309
29	MAT6367	Statistical Computing	2	1		3		6	MAT6309
30	MAT6368	Queuing Theory	2	1		3	7		MAT6315
31	MAT6269	Advanced English for Mathematics	2			2		6	MAT6224
Credit Total			80	12		92			

C. Distribution of courses per Semester

SEMESTER I

No	Code	Courses	Detail Credit			
			T	P	F	S
1	MKU6301	Islam Education	3			3
	MKU6302	Catholic Education				
	MKU6303	Christianity Education				
	MKU6304	Buddhism Education				
	MKU6305	Hinduism Education				
	MKU6306	Confucianism Education				
2	MKU6207	Civic Education	2			2
3	MKU6211	English	2			2
4	MKU6210	Statistics	2			2
5	MAT6301	Logic and Set Theory	3			3
6	MAT6302	Differential Calculus	3			3
7	MAT6203	Plane Geometry	2			2
8	MAT6204	Information and Communication Technology	1	1		2
Total			18	1		19

SEMESTER II

No	Code	Courses	Detail Credit			
			T	P	F	S
1	MKU6208	Pancasila	2			2
2	MKU6214	Social Cultural Education	2			2
3	MAT6205	Number Theory	2			2
4	MAT6206	Solid Geometry	2			2
5	MAT6307	Integral Calculus	3			3
6	MAT6308	Linear Algebra	3			3
7	MAT6309	Advanced Statistics	2	1		3
8	MAT6310	Algorithm and Programming	2	1		3
Total			18	2		20

SEMESTER III

No	Code	Courses	Detail Credit			
			T	P	F	S
1	MAT6311	Abstract Algebra	3			3
2	MAT6312	Analytic Geometry	3			3
3	MAT6313	Advanced Calculus	3			3
4	MAT6314	Differential Equations	3			3
5	MAT6315	Probability Theory	3			3
6	MAT6316	Computer Application	2	1		3
7	MAT6317	Discrete Mathematics	3			3
Total			20	1		21

SEMESTER IV

No	Code	Courses	Detail Credit			
			T	P	F	S
1	AMF6201	Insight and study of Mathematics and Natural Science	2			2
2	MAT6318	Advanced Abstract Algebra	3			3
3	MAT6319	Linear Programming	3			3
4	MAT6320	Partial Differential Equations	3			3
5	MAT6321	Information System and Database	2	1		3
6	MAT6322	Mathematical Modeling	3			3
7	MAT6323	Mathematical Statistics	2	1		3
Total			18	2		20

SEMESTER V

No	Code	Courses	Detail Credit			
			T	P	F	S
1	MKU6209	Indonesian Language	2			2
2	MAT6224	English for Mathematics	2			2
3	MAT6325	Real Analysis	3			3
4	MAT6326	Advanced Linear Algebra	3			3
5	MAT6327	Applied Regression Analysis	2	1		3
6	MAT6228	Transformational Geometry	2			2
7	MAT6329	Operation Research	3			3
8	MAT6330	Complex Analysis	3			3
Total			20	1		21

SEMESTER VI

No	Code	Courses	Detail Credit			
			T	P	F	S
1	MKU6212	Entrepreneurship	1		1	2
2	MAT6231	History of Mathematics	2			2
3	MAT6332	Numerical Methods	2	1		3
4	MAT6233	Advanced Real Analysis	2			2
5	MAT6234	Graph Theory	2			2
6	MAT6335	Mobile Device Programming	2	1		3
7		Elective course 1				3
8		Elective Course 2				3
Total						20

SEMESTER VII

No	Code	Courses	Detail Credit			
			T	P	F	S
1	MKU6313	Community Services			3	3
2	PKL6302	Fieldwork Practice			3	3
3	MAT6336	Applied Multivariate Statistics	2	1		3
4	MAT6237	Mathematics Seminar	2			2
5		Elective course 3				3
6		Elective Course 4				3
Total						17

SEMESTER VIII

No	Code	Courses	Detail Credit			
			T	P	F	S
1	MAT6638	Undergraduate Thesis	6			6
Total						6

Explanation: T: Theory; P: Practice; F: Field; S: Total