

THE ACADEMIC GUIDEBOOK
UNDERGRADUATE PROGRAMME OF MATHEMATICS



DEPARTMENT OF MATHEMATICS
FAKULTAS MATEMATIKA DAN ILMU PENGETAHUAN ALAM
UNIVERSITAS INDONESIA
2021

PREFACE

This academic guidebook of undergraduate programme of Mathematics (UPMath) consists of general information about Department of Mathematics and the 2021 curriculum of UPMath.

Depok, August 2021

Undergraduate Programme of Mathematics

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Chapter 1 Identity of Study Programme

Department of Mathematics of Fakultas Matematika dan Ilmu Pengetahuan Alam (FMIPA) Universitas Indonesia (UI) was founded in 1961, together with Department of Physics, Department of Chemistry, and Department of Biology. At that time, Department of Mathematics was in Kampus UI Salemba located on Jalan Salemba 4, Jakarta Pusat.

From 1961 until 1965, Department of Mathematics had only one full-time teaching staff. Teaching was held by some part-time teaching staffs which were from IBM, BATAN, and private companies. From 1967 until now, then number of full-time teaching staff has been increasing. In 2021, Department of Mathematics has 31 full-time teaching staffs. Education qualification of the staffs ranges from master to doctor.

In 1987 Department of Mathematics moved to a new location, that is Kampus UI Depok. Currently, Department of Mathematics has a 4-floor building in the area of FMIPA UI.

Currently, Department of Mathematics has 4 (four) study programmes. These programmes are

1. the undergraduate programme of Mathematics / **UPMath** (founded in 1961),
2. the graduate programme of Mathematics (founded in 2008),
3. the undergraduate programme of Statistics (founded in 2015), and
4. the undergraduate programme of Actuarial Science (founded in 2017).

Information about UPMath could be seen in Table 1.

Table 1. UPMath profile

1	University	Universitas Indonesia.
2	Faculty	Matematika dan Ilmu Pengetahuan Alam
3	Department	Mathematics
4	Study programme	Mathematics
5	Level programme	Undergraduate
6	BAN-PT (National accreditation)	A (until August 2022)
7	ASEAN University Network Quality Assurance Assessment	More than adequate
8	Graduate's title	Sarjana Sains (S.Si.)
9	Vision of study programme	Being an excellent undergraduate study programme in field mathematics and data science which contribute to global level for advancing science and sustainable development.

10	Mission of study programme	Producing excellent graduates of mathematics who are able to compete in global level for supporting sustainable development. Improving academic atmosphere and research culture in study programme for advancing mathematics and data science.
11	Goal of study programme	Producing graduates of mathematics who are able to design the solution of problem by using mathematics and data science approach, in accordance with scientific norm and academic etics.
12	Address	Department of Mathematics Kampus UI Depok Depok 16424, Indonesia
13	Telephone number	+62217862719
14	Fax number	+62217863439
15	Web address	math.sci.ui.ac.id
16	Head of Department of Mathematics	Dr. Dian Lestari dian.lestari@sci.ui.ac.id 081 585 579 962
17	Head of UPMath	Dr. Hengki Tasman kaprodi.maths1@sci.ui.ac.id 081 585 290 270

Up to August 2021, Department of Mathematics has 31 full-time teaching staffs and 4 part-time teaching staffs. The list of full-time teaching staffs and part-time teaching staffs could be seen in Table 2.

Table 2. List of teaching staffs

No	Name of teaching staff	Email address
1	Alhadi Bustamam., S.Si., M.Kom., Ph.D.	alhadi@sci.ui.ac.id
2	Arman Haqqi Anna Zili, S.Si., M.Si.	armanhaz@sci.ui.ac.id
3	Dra. Bevina Desjwiandra Handari, M.Sc., Ph.D.	bevina@sci.ui.ac.id
4	Dra. Denny Riama Silaban, M.Kom.	denny@sci.ui.ac.id
5	Dhian Widya, S.Si., M.Kom.	dhian.widya61@sci.ui.ac.id
6	Dr. Dra. Dian Lestari, D.E.A.	dian.lestari@sci.ui.ac.id
7	Dr. Dipo Aldila, S.Si, M.Si.	aldiladipo@sci.ui.ac.id
8	Fevi Novkaniza, S.Si., M.Si.	fevi.novkaniza@sci.ui.ac.id
9	Drs. Gatot Fatwanto Hertono, M.Sc., Ph.D.	gatot-f1@ui.ac.id

No	Name of teaching staff	Email address
10	Dr. Helen Burhan, S.Si., M.Si.	helen.burhan@sci.ui.ac.id
11	Dr. rer. nat. Hendri Murfi, S.Si., M.Kom.	hendri@sci.ui.ac.id
12	Dr. Hengki Tasman	htasman@sci.ui.ac.id
13	Dra. Ida Fithriani, M.Si.	ida.f@sci.ui.ac.id
14	Kiki Ariyanti, M.Si., Ph.D.	kiki@sci.ui.ac.id
15	Maulana Malik, S.Si., M.Si.	maulana.malik@sci.ui.ac.id
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19	Rahmi Rusin S.Si., M.Sc.Tech.	rahmirus@sci.ui.ac.id
20	Dra. Rianti Setiadi, M.Si.	rianti@sci.ui.ac.id
21	Sarini Abdullah, S.Si., M.Stats., Ph.D.	sarini@sci.ui.ac.id
22	Dra. Saskya Mary Soemartojo, M.Si.	saskya@sci.ui.ac.id
23	Sindy Devila, S.Si., M.Si.	sindy@sci.ui.ac.id
24	Dra. Siti Aminah, M.Kom.	aminah@sci.ui.ac.id
25	Dra. Siti Nurrohmah, M.Si.	snurrohmah@sci.ui.ac.id
26	Suci Fratama Sari, S.Si., M.Si.	sucifratamas@sci.ui.ac.id
27	Dr. Drs. Suryadi, M.T.	yadi.mt@sci.ui.ac.id
28	Dr. Dra. Titin Siswantining, D.E.A.	titin@sci.ui.ac.id
29	Dr. Dra. Yekti Widyaningsih, M.Si.	yekti@sci.ui.ac.id
30	Dr. Yudi Satria, S.Si., M.T.	ysatria@sci.ui.ac.id
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34	Gianinna Ardanawari, S.Si., M.Si.	gianinna@sci.ui.ac.id
35	Peter John, S.Si., M.Si.	peter.john@sci.ui.ac.id

Due to the Covid-19 pandemic, all document administration in Department of Mathematics is held digitally. Students could manage their documents by sending email to sekretariat.math@sci.ui.ac.id.

Currently, Department of Mathematics has some computer laboratories. These laboratories are equipped with client-server network and licensed software, such as Wolfram Mathematica, Matlab, and SPSS. Moreover, all students could access high-speed internet connection in the building of Department of Mathematics.

Chapter 2 Learning Resources

Universitas Indonesia gives a single account to every student. This single account is used to access internet connection in the campus area, email facility with 1 TB capacity and sites in Universitas Indonesia, such as library, learning management system, academic information system.

Every student can access learning management systems [EMAS](#) and [EMAS2](#). Each course has a site in EMAS or EMAS2. The site contains lecture materials, online quizzes, assignment repository and video link. Universitas Indonesia also provides Microsoft Teams for online discussion.

Student can access Universitas Indonesia library site [OPAC](#). This site has numerous online materials. Student could download online materials via the site when they are in the campus area. When the students are outside the campus, they still could download online material form the site via remote-lib.ui.ac.id.

Students also see their academic track records using academic information system [SIKNG](#). This system helps students to track which courses has been fulfilled or not. This system is also used for choosing courses in the beginning of semester.

Department of Mathematics provides tutorial classes for courses in semester 1 until semester 4. These tutorial classes help students in adapting with study in university.

Chapter 3 Curriculum

Based on Peraturan Rektor UI No. 16 year 2020, Chapter V, Verse 14, the study load of an undergraduate student is **144** (one hundred and forty-four) SKS (Sistem Kredit Semester), including final project (undergraduate theses). Moreover, students could take a **maximal of 160** (one hundred and sixty) SKS. The study load could be finished in minimal 7 semesters and maximal 12 semesters.

Courses in UPMath could be grouped into compulsory courses and elective courses as in Table 3. The detailed list of compulsory courses and elective courses could be seen in Table 4 - Table 8.

Table 3. Course group.

Course group		SKS	Total
Compulsory	University	9	99
	Faculty	8	
	Department	27	
	Study programme	55	
Elective		45	45
Total		144	144

Table 4. University compulsory courses.

No	Code	Course	SKS	Prerequisite	Semester
1	UIGE600003	MPK English	2	-	1
2	UIGE600004	MPK Religion	2	-	1
3	UIGE600006	MPK Integrated	5	-	2
Total			9		

Note: MPK stands for Mata kuliah Pengembangan Kepribadian (Character Building Course).

Table 5. Faculty compulsory courses.

No	Code	Course	SKS	Prerequisite	Semester
1	SCMF600002	Introduction to data science	2	-	1
2	SCCH601101	General Chemistry	2	-	1
3	SCBI601112	General Biology	2	-	2
4	SCPH601110	Fundamental of Physics	2	-	3
Total			8		

Table 6. Department compulsory courses.

No	Code	Course	SKS	Prerequisite	Semester
1	SCMA601001	Logics and Set	3	-	1
2	SCMA601002	Calculus 1	3	-	1
3	SCMA601003	Elementary Linear Algebra	2	-	1
4	SCMA601004	Algorithm and Programming	3	-	1
5	SCMA601005	Calculus 2	3	Calculus 1	2
6	SCMA601006	Linear Algebra 1	3	Elementary Linear Algebra	2
7	SCMA601007	Numerical Methods	3	Elementary Linear Algebra, Calculus 1, Algorithm and Programming	2
8	SCST601202	Mathematical Statistics 1	3	Introduction to Data Science, Calculus 1	2
9	SCMA602008	Analysis 1	4	Calculus 1	3
		Total	27		

Table 7. Study programme compulsory courses.

No	Code	Course	SKS	Prerequisite	Semester
1	SCMA602009	Calculus 3	3	Calculus 2	3
2	SCMA602010	Discrete Mathematics	3	Logic and Set	3
3	SCMA602011	Mathematical Programming	3	Calculus 2, Elementary Linear Algebra	3
4	SCMA602012	Data Structure	3	Elementary Linear Algebra, Algorithm and Programming	3
5	SCMA602013	Ordinary Differential Equations	3	Calculus 2, Elementary Linear Algebra	3
6	SCMA602014	Calculus Vector	2	Calculus 2	4
7	SCMA602015	Analytic Geometry	3	Elementary Linear Algebra	4
8	SCMA602016	Graph Theory	3	Discrete Mathematics	4
9	SCMA602017	Data Science	3	Data Structure	4

No	Code	Course	SKS	Prerequisite	Semester
10	SCMA602018	Partial Differential Equations and Boundary Condition	3	Ordinary Differential Equations	4
11	SCMA602019	Numerical Differential Equations	3	Ordinary Differential Equations, Numerical Methods	4
12	SCMA602020	Analysis 2	4	Analysis 1	4
13	SCMA603021	Research Method	2	Obtain minimum 59 SKS	5
14	SCMA603022	Algebra	4	Linear Algebra 1	5
15	SCMA603023	Complex Function	4	Calculus 3, Calculus Vector	5
16	SCMA603024	Mathematics Modelling	3	Ordinary Differential Equations, Partial Differential Equations and Boundary Condition	5
17	SCMA604000	Undergraduate thesis	6	Obtain minimal 114 SKS	8
		Total	55		

Table 8. Study programme elective courses.

No	Code	Course	SKS	Prerequisite	Semester
1	SCMA603125	Topology	3	Analysis 1	5
2	SCMA603126	Stochastic Differential Equations	3	Ordinary Differential Equations, Statistical Mathematics 1	5
3	SCMA603127	Operation Research	3	Mathematical Programming	5
4	SCMA603128	Computation of intelligence	3	Data Science	5
5	SCMA603129	Design & Analysis of Algorithm	3	Algorithm and programming	5
6	SCMA603130	Linear Algebra 2	3	Linear Algebra 1	6
7	SCMA603131	Cryptography	3	Algebra, Linear Algebra Linier 1	6

No	Code	Course	SKS	Prerequisite	Semester
8	SCMA603132	Parallel Computation	3	Algorithm and Programming	6
9	SCMA603133	Numerical Mathematics	3	Numerical methods	6
10	SCMA603134	Numerical Stochastic Differential Equations	3	Numerical Differential Equations, Mathematical Statistics 1	6
11	SCMA603135	Dynamical System	3	Ordinary Differential Equations	6
12	SCMA603136	Network Optimization	3	Mathematical Programing, Discrete Mathematics	6
13	SCMA603137	Special Topic 1	3	-	6
14	SCMA603138	Special Topic 2	3	-	6
15	SCMA604139	Functional Analysis	3	Analysis 1, Algebra	7
16	SCMA604140	Theory of Measure and Integration	3	Analysis 2	7
17	SCMA604141	Theory of control optimal	3	Mathematical Programming, Ordinary Differential Equations	7
18	SCMA604142	Theory of Computation	3	Algorithm and programming, Discrete Mathematics	7
19	SCMA604143	Bioinformatics	3	Numerical Methods	7
20	SCMA604144	Biomathematics	3	Mathematical Modelling	7
		Total	60		

Some elective course could be taken from the Undergraduate Programme of Statistics and the Undergraduate Programme of Actuarial Science in Department of Mathematics of Universitas Indonesia as in Table 9.

Table 9. Some elective courses outside UPMath

No	Study Programme	Course	SKS	Prerequisite
1	Statistics	Mathematical Statistics 2	3	Mathematical Statistics 1
2	Statistics	Mathematical Statistics 3	3	Mathematical Statistics 2
3	Statistics	Linear Model	3	Mathematical Statistics 1
4	Statistics	Advanced Linear Model	3	Linear Model

No	Study Programme	Course	SKS	Prerequisite
5	Actuarial Science	Mathematics of Finance 1	3	Calculus 2
6	Actuarial Science	Mathematics of Finance 2	3	Mathematics of Finance 1
8	Actuarial Science	Derivative Financial Modelling	3	Mathematics of Finance 2

Department of Mathematics has memorandum of understanding with the Society of Actuaries of Indonesia (SAI), see [Society Of Actuaries Of Indonesia](#). Some courses held by its Undergraduate programme of Actuarial Science has been mapped to have equivalency to actuary examination modules, see Table 10. This equivalency becomes one consideration for UPMath's student in taking an elective course.

Table 10. Equivalency between SAI modules and courses.

No	SAI examination module	Courses
1	A10 – Mathematics of Finance	Mathematics of Finance 1 Mathematics of Finance 2
2	A20 – Probability and Statistics	Mathematical Statistics 1 Mathematical Statistics 2
3	A30 - Economy	Theory of Microeconomic Theory of Macroeconomic
4	A40 - Accounting	Accounting 1 Accounting 2
5	A50 – Statistical Methods	Linear Model Prediction Methods Survival Model
6	A60 – Mathematics of Actuary	Life Contingency 1 Life Contingency 2
7	A70 – Modelling and Risk Theory	Risk Modeling 1 Risk Modeling 2

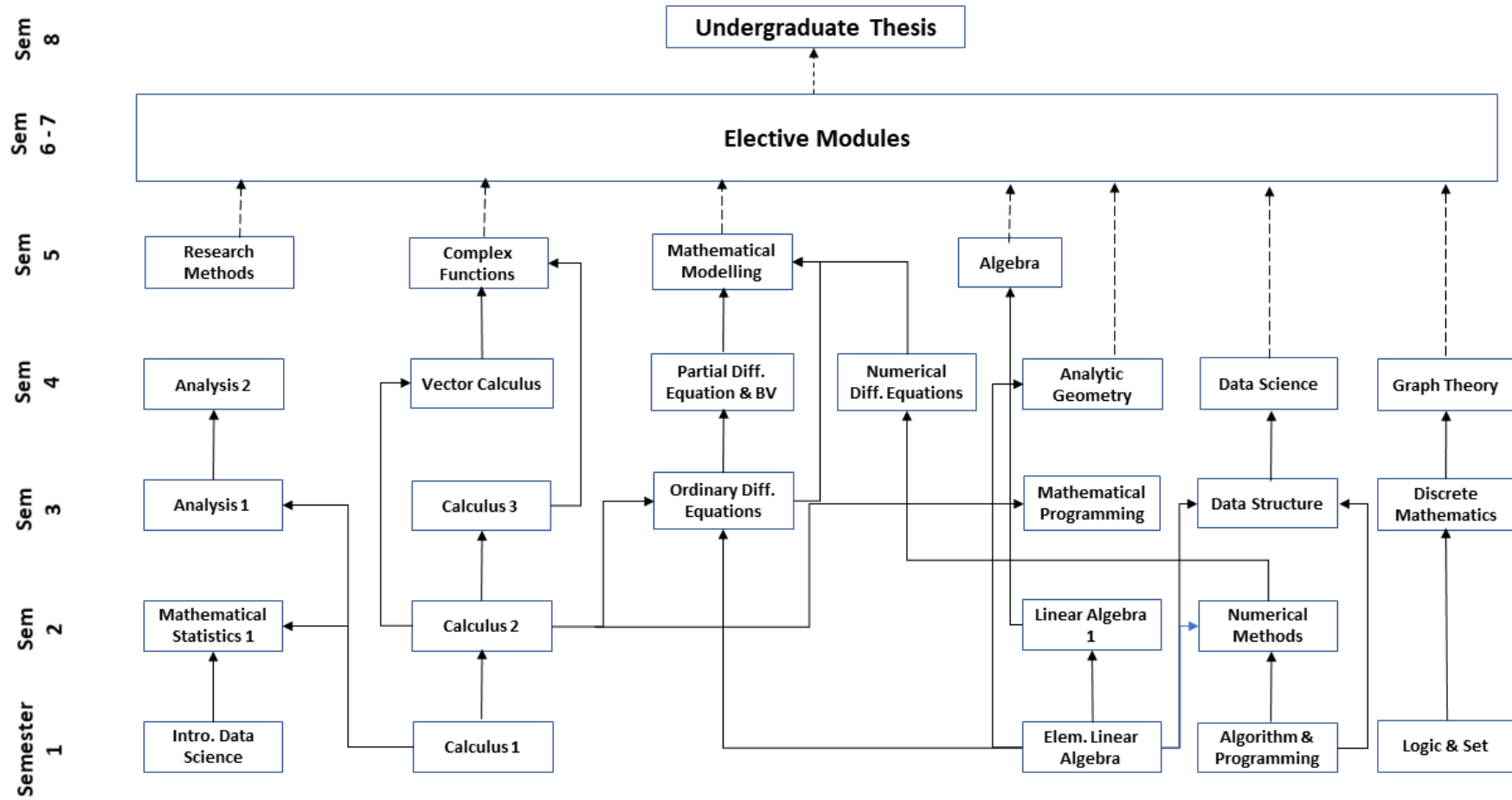
Distribution of courses in semesters could be seen in Table 11. Moreover, relation between a course and its prerequisites could be seen in Table 12.

Table 11. Distribution of courses in 8 semesters

SEMESTER 1			SEMESTER 2			SEMESTER 3			SEMESTER 4		
CODE	COURSE	SKS	CODE	COURSE	SKS	CODE	COURSE	SKS	CODE	COURSE	SKS
UIGE600003	MPK English	2	UIGE600006	MPK Integrated	5	SCPH601110	Fundamental of Physics	2	SCMA602014	Calculus Vector	2
UIGE600004	MPK Religion	2	SCBI601112	General Biology	2	SCMA602008	Analysis 1	4	SCMA602015	Analytic Geometry	3
SCCH601101	General Chemistry	2	SCMA601005	Calculus 2	3	SCMA602009	Calculus 3	3	SCMA602016	Graph Theory	3
SCMF600002	Introduction to Data Science	2	SCMA601006	Linear Algebra 1	3	SCMA602010	Discrete Mathematics	3	SCMA602017	Data Science	3
SCMA601001	Logic and Set	3	SCMA601007	Numerical Methods	3	SCMA602011	Mathematical Programming	3	SCMA602018	Partial Differential Equations & Boundary Condition	3
SCMA601002	Calculus 1	3	SCST601202	Mathematical Statistics 1	3	SCMA602012	Data Structure	3	SCMA602019	Numerical Differential Equations	3
SCMA601003	Elementary Linear Algebra	2				SCMA602013	Ordinary Differential Equations	3	SCMA602020	Analysis 2	4
SCMA601004	Algorithm and Programming	3									
	Total SKS in Semester 1	19		Total SKS in Semester 2	19		Total SKS in Semester 3	21		Total SKS in Semester 4	21
	Total SKS upto Semester 1	19		Total SKS upto Semester 2	38		Total SKS upto Semester 3	59		Total SKS upto Semester 4	80

SEMESTER 5			SEMESTER 6			SEMESTER 7			SEMESTER 8		
CODE	COURSE	SKS	CODE	COURSE	SKS	CODE	COURSE	SKS	CODE	COURSE	SKS
SCMA603021	Research Method	2		Elective courses	19		Elective courses	20	SCMA604000	Undergraduate thesis	6
SCMA603022	Algebra	4									
SCMA603023	Complex Function	4									
SCMA603024	Mathematical Modelling	3									
	Elective courses	6									
	Total SKS in Semester 5	19		Total SKS in Semester 6	19		Total SKS in Semester 7	20		Total SKS in Semester 8	6
	Total SKS upto Semester 5	99		Total SKS upto Semester 6	118		Total SKS upto Semester 7	138		Total SKS upto Semester 8	144

Figure 1. Course network.



References

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2. Kementerian Pendidikan dan Kebudayaan: Buku Panduan Merdeka Belajar – Kampus Merdeka, Edisi pertama, 2020.
3. Kementerian Pendidikan dan Kebudayaan: Panduan Penyusunan Kurikulum Pendidikan Tinggi di Era Industri 4.0 untuk Mendukung Merdeka Belajar – Kampus Merdeka, Edisi ke empat, 2020.
4. Peraturan Menteri Pendidikan dan Kebudayaan RI No. 3/2020.
5. Peraturan Rektor UI No. 7/2020.
6. Peraturan Rektor UI No. 16/2020.
7. Keputusan Rektor UI No. 2361/SK/R/UI/2020.
8. Nota Dinas UI No. ND-332/UN2.R1/PDP.00.01/2020.