

## **Mathematics**

### **Introduction**

In general, progress of sciences including mathematics has become a basis of industrial and technological revolution. Growth in mathematics has in fact brought various new areas of technological and interdisciplinary sciences. By the presence of medium computers, simulation, and mathematical modeling, it brought also new study areas like intelligent system, fuzzy logic, data security, and others. The contribution of mathematics in the growth of modern technology has been known and confessed as "basic science". The role of technology in global information era which is of vital importance can give an answer to super highway information" so that we are able to reduce our left behind achievements in sciences and technology and then face global competition. In dealing with new technology, mathematics students will be able to yield a new breakthrough in facing global competition challenge.

### **Vision**

A world class department in Mathematics based on ICT.

### **Mission**

The mission of Mathematics Program is to contribute to the global community through the provision of world-class education by :

1. Educating students with fundamental knowledge & skills to apply Computational Mathematics using ICT in developing innovative algorithm and software for a career as an applied mathematician or system analyst.
2. Providing solid learning experience through creating the most creative and value-added talents of leaders for global community as well as conducting professional services to improve the quality of life.
3. Providing high impact research that positively contributing to the quality of life of Indonesians and the international community.

### **Program Objective**

The objectives of the program are :

1. To provide students with a solid knowledge ranging from Fundamental Mathematics and Computer Science to Computational Mathematics and Computing Technology.
2. To provide students with knowledge and abilities in conducting mathematical analysis and modeling to solve problem in related fields to be successful applied mathematics career.
3. To prepare students with necessary techniques & skills in developing innovative algorithm and software to be excellence system analyst.

### **Student Outcomes**

After completing the study, graduates are:

1. Able to explore, logical reasoning, generalization abstraction, and formal proof in formulating and model problems with specific variables and assumptions through mathematical approach with or without mathematical software.
2. Able to construct, modify, analyze mathematical models of a system/problems, assess accuracy of the models and make conclusions

3. Able to analyze various alternative mathematical models that are available and present the conclusions of analysis independently or in groups for making decision.
4. Able to create software by implementing mathematical models.

### Prospective Career of the Graduates

The graduates of the study program Mathematics are able to follow careers in :

1. General (Lecturer, Management trainee)
2. Business (Quantitative credit analyst, Index forecasting analyst, Actuary analyst)
3. Management (Project planning analyst, Decision support system, EDP system)
4. Industry (Inventory control analyst, Queuing analyst, Assignment analyst)
5. Computer System analyst (Remote sensing applications, Image processing, Analyst algorithm, and Simulation programming)
6. Researcher (LIPI, BPPT, Department R&D, BEI)

### Curriculum

Mathematics study program curriculum is developed according to the national curriculum of Mathematics Studies, while the local substances are developed according to the ACM (American Computing Machineries), standard curriculum and market demand. As a result, mathematics graduates are expected to be able to compete nationally and internationally.

### Course Structure

Sem	Code	Course Name	SCU	Total	
1	CHAR6013	Character Building: Pancasila	2	20	
	COMP6047	Algorithm and Programming	4/2		
	MATH6038	Calculus I*	4		
	MATH6025	Discrete Mathematics*	4		
	STAT6026	Probability and Statistics*	2		
	<b>English University Courses I</b>				
	ENGL6128	English in Focus	2		
	ENGL6130	English for Business Presentation	2		
2	CHAR6014	Character Building: Kewarganegaraan	2	21	
	MATH6015	Applied Linear Algebra*	4		
	MATH6016	Calculus II	4		
	COMP6048	Data Structures	4/2		
	MATH6056	Scientific Computing Lab*	2		
	LANG6061	Indonesian	1		
	<b>English University Courses II</b>				
	ENGL6129	English Savvy	2		
	ENGL6131	English for Written Business Communication	2		

Sem	Code	Course Name	SCU	Total
3	CHAR6015	Character Building: Agama	2	20
	MATH6008	Mathematical Statistics I*	4	
	MATH6019	Calculus III	4	
	MATH6057	Ordinary Differential Equations*	2/2	
	ENTR6003	Entrepreneurship I	2	
	MATH6026	Mathematics Programming*	4	
4	MATH6068	Partial Differential Equations	2	20
	MATH6009	Mathematical Statistics II	4	
	MATH6018	Modern Algebra*	4	
	MATH6023	Complex Variable Function*	4	
	MATH6059	Geometric Algebra*	4	
	MATH6058	Numerical Methods I*	2	
5	MATH6050	Actuarial Mathematics	4	22
	MATH6092	Numerical Methods II*	2	
	MATH6095	Applied Mathematics Modeling*/**	2	
	MATH6061	Computational Number Theory*	2/1	
	COMP6051	Web Programming	2/1	
	MATH6064	Applied Projective Geometry	2	
	MATH6021	Real Analysis*	4	
	STAT6021	Research Methodology*	2	
6	MATH6043	Seminar	2	22
	ENTR6004	Entrepreneurship II	2	
	MATH6066	Computational Geometry*/**	2/1	
	MATH6067	Cryptography	2/1	
	MATH6063	Coding Theory*	4	
	MOBI6021	Mobile Programming	2/2	
	MATH6049	Mathematics of Finance*	4	
7	<b>Enrichment Program</b>		15	15
8	MATH6041	Thesis	6	6
			<b>TOTAL CREDIT 146 SCU</b>	

\*) This course is delivered in English

\*\*\*) Entrepreneurship Embedded

**English University Courses:**

- ) For 1<sup>st</sup> Semester : English University Courses I, student with score Binus University English Proficiency Test less than 500 will take English in Focus, and student with score test greater than or equal to 500 will take English for Business Presentation
- ) For 2<sup>nd</sup> Semester: English University Courses II, student with score Binus University English Proficiency Test less than 500 will take English Savvy, and student with score test greater than or equal to 500 will take English for Written Business Communication

**Enrichment Program (7<sup>th</sup> Semester):**

-) Student will take one of enrichment program tracks (off campus).

**Enrichment Internship Track**

Code	Course Name	SCU	Total
MATH6073	Internship	8	15
MATH6074	Mathematical Modeling Solution in Industry	2	
MATH6075	Applied Programming in Industry	2	
MATH6114	EES in Industry	3	

**Enrichment Entrepreneurship Track**

Code	Course Name	SCU	Total
ENTR6062	Business Start Up	8	15
ENTR6063	Business Model & Validation	2	
ENTR6064	Launching New Venture	2	
ENTR6085	EES in New Business	3	

**Enrichment Research Track**

Code	Course Name	SCU	Total
RSCH6037	Research Experience	8	15
RSCH6038	Scientific Writing	4	
RSCH6053	Global EES	3	

**Enrichment Community Development Track**

Code	Course Name	SCU	Total
CMDV6001	Community Outreach Project Implementation	8	15
CMDV6002	Community Outreach Project Design	4	
CMDV6015	Employability and Entrepreneurial Skills	3	

**Enrichment Study Abroad Track**

Code	Course Name	SCU	Total
<b>Elective courses list for study abroad*</b>			
GLOB6005	Elective Course for Study Abroad 1	4	15
GLOB6006	Elective Course for Study Abroad 2	4	
GLOB6007	Elective Course for Study Abroad 3	4	
GLOB6008	Elective Course for Study Abroad 4	4	
GLOB6009	Elective Course for Study Abroad 5	2	
GLOB6010	Elective Course for Study Abroad 6	2	
GLOB6011	Elective Course for Study Abroad 7	2	
GLOB6012	Elective Course for Study Abroad 8	2	
GLOB6013	Elective Course for Study Abroad 9	2	
GLOB6014	Elective Course for Study Abroad 10	2	
GLOB6015	Elective Course for Study Abroad 11	2	
GLOB6016	Elective Course for Study Abroad 12	2	
GLOB6041	Elective Course for Study Abroad 25	3	
GLOB6042	Elective Course for Study Abroad 26	1	

\*)Transferred courses will be transferred based on credit transfer policies on study program with total of 15 credits.

**Student should pass all of these quality controlled courses as listed below:**

No	Code	Course Name	Minimum Grade
1	CHAR6013	Character Building: Pancasila	B
2	ENTR6004	Entrepreneurship II	C
3	COMP6047	Algorithm and Programming*	C
4	COMP6048	Data Structures*	C
5	MATH6019	Calculus III*	C
6	MATH6068	Partial Differential Equations	C
7	MATH6018	Modern Algebra	C
8	MATH6092	Numerical Methods II*	C
9	MATH6095	Applied Mathematics Modeling*	C
10	MATH6066	Computational Geometry	C

\*Tutorial & Multipaper