

## Mathematics

### Introduction

In general, progress of sciences including mathematics has become a basis on 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. Contribution of mathematics in the growth of modern technology has been known and confessed as “basis 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.

### General and Specific Objective

The global progress of sciences and mathematics has made a breakthrough in the technological and industrial revolution. The development of mathematics especially gives many new branches in sciences and technology, like intelligence system, process and system engineering, optimization models, soft computing, computational geometry, pattern recognition etc. By computer technology, simulation and mathematical modeling, mathematics can help to solve various problems in many fields e.g. engineering, economics, transportation, ecology and medicine.

The specific objective is to provide the knowledge, discipline insight and expertise in Applied Mathematics, mainly in Computational Mathematics in order that the students can increase their ability to:

1. Ability to apply, analyze using Computational Mathematics and to solve, calculate the related problems.
2. Ability to interpret, analyze computation problems, and create mathematical solution in the form algorithm, and identify, define the Computing Technology appropriate to its solution.
3. Ability to recognize, use, and appraise various mathematics knowledge.
4. Ability to apply, analyze, formulate and evaluate using advanced Computational Mathematics

### Prospective Career of the Graduates

The graduates of the study program Applied 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

Applied 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 complete nationally and internationally.

**Course Structure**

Sem	Code	Course Name	SCU	Total
1	CB412	CB: Self Development	2	20
	K0144	Discrete Mathematics	4	
	T0016	Algorithm and Programming	4/2	
	T0604	Introduction to Information Technology	4	
	K0424	Calculus I	4	
2	CB422	CB: Spiritual Development	2	20
	K0034	Applied Linear Algebra	4	
	G1372	English Entrant	2	
	T0026	Data Structures	4/2	
	I0262	Probability and Statistics	2	
	K0044	Calculus II	4	
3	K0754	Ordinary Differential Equations	2/2	20
	G1382	English in Focus	2	
	T0044	Object Oriented Programming	2/2	
	I0344	Mathematical Statistics I	4	
	K0074	Calculus III	4	
	K0742	Scientific Computing Lab	2	
4	CB432	CB: Interpersonal Development	2	24
	G1392	English Savvy	2	
	EN001	Entrepreneurship I	2	
	K0762	Numerical Methods I	2	
	I0354	Mathematical Statistics II	4	
	K0784	Geometric Algebra	4	
	K0114	Complex Variable Function	4	
5	CB442	CB: Professional Development	2	20
	K0902	Interdisciplinary Seminar*	2	
	K0064	Modern Algebra	4	
	K0882	Partial Differential Equations	2	
	K0793	Numerical Methods II	2/1	
	K0803	Computational Number Theory	2/1	
	K0164	Mathematics Programming	4	

Sem	Code	Course Name	SCU	Total	
6	K0094	Real Analysis	4	20	
	EN002	Entrepreneurship II	2		
	K0892	Applied Mathematics Modeling	2		
	K0824	Fluid Physics	4		
	<b>Elective Courses I</b>				
	K0852	Computational Fluid Dynamics	2		
	K0863	Computational Geometry	2/1		
	K0813	Computer Vision	2/1		
	K0873	Cryptography	2/1		
	T0114	Software Engineering	4		
	T1404	Mobile Programming	4		
7	I0192	Research Methodology	2	12	
	K0914	Interdisciplinary Project*	4		
	K0834	Coding Theory	4		
	K0842	Applied Projective Geometry	2		
	<b>Elective Courses II</b>				
	T0273	Expert Systems	2/1		
	T0264	Artificial Intelligence	4		
	T0053	Web Programming	2/1		
	T1392	Advanced Object Oriented Programming	2		
	T0293	Neuro Computing	2/1		
T0324	Computer Architecture and Organization	4			
8	K0456	Thesis/Final Project	6	6	
	<b>Elective Courses</b>				
	G1402	English for Business Presentation	2		
	G1412	English for Written Business Communication	2		
<b>TOTAL CREDIT 146</b>					

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

<b>No</b>	<b>Code</b>	<b>Course Name</b>	<b>Minimum Grade</b>
1	CB412	CB: Self Development	B
2	EN001	Entrepreneurship	C
3	K0044	Calculus II	C
4	I0354	Mathematical Statistics II	C
5	K0892	Applied Mathematics Modeling	C
6	K0793	Numerical Methods II	C
7	K0834	Coding Theory	C
8	K0842	Applied Projective Geometry	C