Computer Science & Mathematics

Introduction

The contribution of Computer Science and Applied Mathematics to modern business practice is becoming more important as there are so many related fields such as process and system engineering, quality control, actuaries, product design/model planning, prediction, management and living environment, all of which use the most sophisticated electronics technology, mathematics and computer software. The combination of two study programs into one study program is intended to maximize the capabilities of the students to solve problems in these many related fields.

Vision

A world class department in Computational Mathematics based on ICT

Mission

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

1. Educating students with fundamental knowledge & skills of to apply Computational Mathematics using ICT in developing innovative algorithm and software for a career as an applied mathematician or system analyst.
2. Providing a solid learning experience through creating the most creative and value-added talents of leaders for the 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 modelling to solve problem in related fields and to be successful applied mathematics career.
3. To prepare students with the necessary techniques & skills in developing innovative algorithm and software to be excellence system analyst.

Graduate Competency

At the end of the program, graduates will be able to :

1. Graduates will be able to apply, analyze and solve problems using Fundamental Mathematics, especially in Computer Science.
2. Graduates will be able to interpret, analyze and create mathematical solutions in the form of algorithms, and integrate the appropriate Computing Technology for its solution.
3. Graduates will be able to recognize, apply, appraise various mathematics methods
4. Graduates will be able to apply, analyze, formulate and evaluate using advanced Computational Mathematics.

5. Graduates will be able to analyze, compose, and assess innovative algorithms in order to solve real problems in many related fields.
6. Graduates will be able to use and analyze current techniques and skills in order to design and evaluate recent software

Prospective Career of the Graduates

The graduates of the double study program Computer Science and Applied Mathematics could follow careers in :

1. Information Technology area (software and game developer, IT consultant)
2. Computer (network specialist, computer simulation specialist)
3. Industry (educator, quantitative product planner, optimization analyst)
4. Business (quantitative credit analyst, business analyst)
5. Management (DSS manager, actuary)

Curriculum

With reference to the Vision and Mission of UBINUS, the role of Computer Science and Applied Mathematics in the future and its current standing in Indonesia, the study program will contain the following elements:

1. Solid education to increase mathematical reasoning capability and ability to solve problems in other fields;
2. The academic atmosphere that will facilitate students' learning in order that students will develop skills in communicating their mathematical reasoning and skill in software engineering; and
3. An environment that fosters active learner independence and encourages students to be able to succeed in their professional career and in fields related to Computer Science and Applied Mathematics.

Furthermore, besides this department provides the means and expertise in Computer Science and Applied Mathematics to prepare students for a career as a Applied Mathematician or Software Engineer who be able to create mathematical models to solve problems in many related fields, it also provides capability in developing Computer Science or Applied Mathematics both in Indonesia and among the nations of the world in order to pursue higher degree of education.

Course Structure

Sem	Code	Course Name	SCU	Total
1	CB412	CB: Self Development	2	20
	T0152	Programming Language Concepts	2	
	T0016	Algorithm and Programming	4/2	
	T0604	Introduction to Information Technology	4	
	K0144	Discrete Mathematics	4	
	G1372	English Entrant	2	
2	CB422	CB: Spiritual Development	2	20
	K0034	Applied Linear Algebra	4	
	K0424	Calculus I	4	
	T0026	Data Structures	4/2	
	I0262	Probability and Statistics	2	
	G1382	English in Focus	2	
3	K0044	Calculus II	4	24
	T0044	Object Oriented Programming	2/2	
	I0344	Mathematical Statistics I	4	
	G1392	English Savvy	2	
	T0104	Program Design Methods	4	
	T0206	Database Systems	4/2	
4	CB432	CB: Interpersonal Development	2	24
	K0742	Scientific Computing Lab	2	
	K0074	Calculus III	4	
	I0354	Mathematical Statistics II	4	
	K0754	Ordinary Differential Equations	2/2	
	K0762	Numerical Methods I	2	
	T0316	Operating System	4/2	
5	CB442	CB: Professional Development	2	24
	T0593	Human and Computer Interaction	2/1	
	K0784	Geometric Algebra	4	
	H0515	Computer Networks	4/1	
	K0114	Complex Variable Function	4	
	EN001	Entrepreneurship I	2	
	T0034	Algorithm Design and Analysis	4	

Sem	Code	Course Name	SCU	Total
6	K0813	Computer Vision	2/1	24
	K0882	Partial Differential Equations	2	
	T1392	Advanced Object Oriented Programming	2	
	K0902	Interdisciplinary Seminar*	2	
	T0114	Software Engineering	4	
	K0803	Computational Number Theory	2/1	
	K0064	Modern Algebra	4	
	T0324	Computer Architecture and Organization	4	
7	I0192	Research Methodology	2	24
	K0094	Real Analysis	4	
	EN002	Entrepreneurship II	2	
	K0793	Numerical Methods II	2/1	
	K0842	Applied Projective Geometry	2	
	K0164	Mathematics Programming	4	
	T0264	Artificial Intelligence	4	
	T0053	Web Programming	2/1	
8	K0914	Interdisciplinary Project*	4	24
	K0824	Fluid Physics	4	
	K0834	Coding Theory	4	
	T0273	Expert Systems	2/1	
	K0892	Applied Mathematics Modeling	2	
	T1404	Mobile Programming	2/2	
	T0293	Neuro Computing	2/1	
9	K0852	Computational Fluid Dynamics	2	12
	K0863	Computational Geometry	2/1	
	T0174	Compilation Techniques	4	
	K0873	Cryptography	2/1	
10	K0456	Thesis/Final Project	6	6
	Elective Courses			
	G1402	English for Business Presentation	2	
	G1412	English for Written Business Communication	2	
TOTAL CREDIT 202				

*) Entrepreneurship Embedded

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

No	Code	Course Name	Minimum Grade
1	CB412	CB: Self Development	B
2	EN002	Entrepreneurship	C
3	K0074	Calculus III*	C
4	K0882	Partial Differential Equations	C
5	K0892	Applied Mathematics Modeling*	C
6	K0793	Numerical Methods II*	C
7	K0064	Modern Algebra	C
8	K0863	Computational Geometry*	C
9	T0016	Algorithm and Programming*	C
10	T0026	Data Structures*	C
11	T0206	Database Systems	C
12	T0316	Operating System	C
13	T0114	Software Engineering	C
14	T0264	Artificial Intelligence	C

*) Tutorial & Multipaper