

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 | | |
| | English University Courses I | | | | |
| | 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 | | |
| | English University Courses II | | | | |
| | 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 | Enrichment Program | | 15 | 15 |
| 8 | MATH6041 | Thesis/Final Project | 6 | 6 |
| | | | TOTAL CREDIT | 146 SCU |

*) This course is delivered in English

**) Entrepreneurship Embedded

English University Courses:

-) For 1st 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 2nd 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 (7th 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 |
|--|-------------------------------------|-----|-------|
| Elective courses list for study abroad* | | | |
| 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