

## **Statistics and Computer Science**

### **Introduction**

Along with technological growth of computer at present, statistical technique becomes a tool which is widely used by many people to finish the problems better, such as problems in management area, research, business, marketing, quality operation, best quality, forecast, risk analysis of consumer satisfaction, environment, and others make the contribution of Statistics and Computer Science is progressively growing important. The combination of two study majors into one program is designed to maximize the learning opportunities for the student who chooses the double majors. To give working experience for student, we provide the facilities to practice in industry for 1 semester in national and international companies besides 4.5 years they study on campus. We facilitate student to job training at industry, research with industry and entrepreneurship program.

### **Vision**

A world class department in Computational Statistics based on ICT.

### **Mission**

The mission of Statistics and Computer Science 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 Statistics using ICT in acquiring business information for a career as a market researcher or business 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 in Indonesia and the international community

### **Program Objective**

The objectives of the program are:

1. To provide students with a solid knowledge ranging from Fundamental Statistics and Computer Science to Computational Statistics and Database Technology
2. To provide students with abilities conduct statistical analysis and marketing research to solve problem in related fields to be successful market researcher
3. To prepare students with necessary skills in developing database and be expert in data mining to be excellence business analyst

### **Student Outcomes**

After completing the study, graduates are:

1. Able to create software application design with the implementation of database system principal design to solve structured and semi-structured data.
2. Able to design software application solution based on problem analysis which can be solved with structured approach in informatics area.

3. Able to assess information technology trend and communication to deliver alternative solution of software development.
4. Able to perform the experimental design , collection and generate data (in survey, experiments or simulations), organizing data, analyzing data using statistical techniques, and valid conclusion by using at least one statistical software.
5. Able to resolve the problem assessment (estimation), testing hypothesis, prediction, and forecasting on several fronts, using data and statistical methodologies (methods and models) and presenting it in a form that easily understood by the description of the user.
6. Able to analyze some alternatives solution in statistical field to solve the problems and able to present the conclusions analysis in order to make the right decision.
7. Able to implement statistical models into software solutions needed.

### **Prospective Career of the Graduates**

The graduates of the double study program Statistics and Computer Science are able to follow careers in:

1. Business (market researcher, forecasting analyst).
2. Management (business analyst, evaluator of company performance).
3. Information Technology area (database designer, system analyst).
4. Industry (data scientist, decision making analyst, quality control analyst).
5. Finance and Accounting (risk analyst, profit growth analyst).

### **Curriculum**

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

1. Solid education to increase statistical analysis capability and ability to extract information from any kind of data that emerge in databases.
2. The academic atmosphere that will facilitate students' learning in order that the students will develop skills in communicating their statistical analysis and skills in developing database.
3. An environment that fosters active learner independence and encourages students to be able to succeed in their professional career and in the fields related to Computer Science and Applied Statistics.

Furthermore, besides this department provides the means and expertise in Statistics and Computer Science to prepare students for a career as a Market Researcher or Database Designer who be able to analyze any kind of data that emerge in databases to extract information, it also provides capability in developing Computer Science or Applied Statistics 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        | CHAR6013                                   | Character Building: Pancasila       | 2   | 20    |  |
|          | COMP6060                                   | Programming Language Concepts       | 2   |       |  |
|          | COMP6047                                   | Algorithm and Programming           | 4/2 |       |  |
|          | MATH6038                                   | Calculus I*                         | 4   |       |  |
|          | MATH6025                                   | Discrete Mathematics*               | 4   |       |  |
|          | <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   |       |  |
|          | MATH6039                                   | Calculus II                         | 4   |       |  |
|          | COMP6048                                   | Data Structures                     | 4/2 |       |  |
|          | STAT6026                                   | Probability and Statistics*         | 2   |       |  |
|          | LANG6061                                   | Indonesian                          | 1   |       |  |
|          | <b>English University Courses II</b>       |                                     |     |       |  |
|          | ENGL6129                                   | English Savvy                       | 2   |       |  |
| ENGL6131 | English for Written Business Communication | 2                                   |     |       |  |
| 3        | CHAR6015                                   | Character Building: Agama           | 2   | 24    |  |
|          | STAT6018                                   | Statistical Theory I*               | 4   |       |  |
|          | STAT6094                                   | Statistical Computing Lab*          | 2/2 |       |  |
|          | STAT6016                                   | Simulation Techniques               | 2   |       |  |
|          | COMP6056                                   | Program Design Methods              | 4   |       |  |
|          | COMP6175                                   | Object Oriented Programming         | 2/2 |       |  |
|          | COMP6153                                   | Operating System                    | 2/2 |       |  |
| 4        | ISYS6169                                   | Database Systems                    | 4/2 | 24    |  |
|          | STAT6058                                   | Sampling Techniques*                | 2   |       |  |
|          | STAT6047                                   | Numerical Methods for Statistics*   | 2   |       |  |
|          | STAT6020                                   | Statistical Theory II               | 4   |       |  |
|          | STAT6011                                   | Design and Analysis of Experiments  | 4   |       |  |
|          | STAT6037                                   | Non Parametric Statistics*          | 2   |       |  |
|          | STAT6085                                   | Regression Analysis*                | 2/2 |       |  |
| 5        | STAT6044                                   | Categorical Data Analysis           | 2   | 24    |  |
|          | COMP6049                                   | Algorithm Design and Analysis       | 4   |       |  |
|          | STAT6043                                   | Linear Model*                       | 2   |       |  |
|          | ENTR6003                                   | Entrepreneurship I                  | 2   |       |  |
|          | ISYS6172                                   | Database Design                     | 2/1 |       |  |
|          | COMP6057                                   | Software Engineering                | 4   |       |  |
|          | STAT6051                                   | Time Series Analysis*               | 2/1 |       |  |
|          | STAT6053                                   | Multivariate Statistics*            | 4   |       |  |

| Sem                         | Code                      | Course Name                      | SCU | Total |
|-----------------------------|---------------------------|----------------------------------|-----|-------|
| 6                           | STAT6054                  | Econometrics*                    | 2/1 | 24    |
|                             | STAT6036                  | Stochastic Process*              | 4   |       |
|                             | COMP6065                  | Artificial Intelligence          | 4   |       |
|                             | CPEN6098                  | Computer Networks                | 2/2 |       |
|                             | COMP6176                  | Human and Computer Interaction   | 2/2 |       |
|                             | STAT6115                  | Statistical Quality Control**    | 2/1 |       |
|                             | STAT6055                  | Structural Equation Modeling*    | 2   |       |
| 7                           | ENTR6004                  | Entrepreneurship II              | 2   | 24    |
|                             | COMP6062                  | Compilation Techniques           | 4   |       |
|                             | STAT6105                  | Statistical Marketing Research** | 4   |       |
|                             | STAT6040                  | Scientific Computation*          | 4   |       |
|                             | STAT6031                  | Seminar                          | 2   |       |
|                             | MATH6049                  | Mathematics of Finance*          | 4   |       |
|                             | STAT6106                  | Statistical Process Control*     | 4   |       |
| 8                           | COMP6140                  | Data Mining                      | 2/2 | 20    |
|                             | ISYS6170                  | Data Warehouse                   | 2/1 |       |
|                             | STAT6050                  | Survival Analysis*               | 2/1 |       |
|                             | MOBI6021                  | Mobile Programming               | 2/2 |       |
|                             | COMP6064                  | Geographical Information System  | 2/1 |       |
|                             | COMP6051                  | Web Programming                  | 2/1 |       |
| 9                           | <b>Enrichment Program</b> |                                  | 15  | 15    |
| 10                          | STAT6030                  | Thesis/Final Project             | 6   | 6     |
| <b>TOTAL CREDIT 202 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 (9<sup>th</sup> Semester):**

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

**Enrichment Internship Track**

| Code     | Course Name                     | SCU | Total |
|----------|---------------------------------|-----|-------|
| STAT6090 | Internship                      | 8   | 15    |
| STAT6091 | Data Analysis in Industry       | 2   |       |
| STAT6092 | Statistical Program in Industry | 2   |       |
| STAT6117 | EES in Statistics Industry      | 3   |       |

**Enrichment Entrepreneurship Track**

| Code     | Course Name                               | SCU | Total |
|----------|---|-----|-------|
| ENTR6292 | Business Start Up                         | 8   | 15    |
| ENTR6206 | Business Model & Validation in Statistics | 2   |       |
| ENTR6207 | Launching New Venture in Statistics       | 2   |       |
| ENTR6405 | EES in Statistics                         | 3   |       |

**Enrichment Research Track**

| Code     | Course Name                      | SCU | Total |
|----------|----------------------------------|-----|-------|
| RSCH6225 | Research Experience              | 8   | 15    |
| RSCH6156 | Scientific Writing in Statistics | 4   |       |
| RSCH6210 | Global EES in Statistics         | 3   |       |

**Enrichment Community Development Track**

| Code     | Course Name  | SCU | Total |
|----------|--|-----|-------|
| CMDV6125 | Community Outreach Project Implementation              | 8   | 15    |
| CMDV6074 | Community Outreach in Statistics Project Design        | 4   |       |
| CMDV6108 | Employability and Entrepreneurial Skills in Statistics | 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  | STAT6026 | Probability and Statistics    | C             |
| 6  | MATH6039 | Calculus II*                  | C             |
| 7  | COMP6056 | Program Design Methods*       | C             |
| 8  | STAT6020 | Statistical Theory II*        | C             |
| 9  | ISYS6169 | Database Systems              | C             |
| 10 | STAT6085 | Regression Analysis           | C             |
| 11 | COMP6057 | Software Engineering*         | C             |
| 12 | STAT6036 | Stochastic Process            | C             |
| 13 | STAT6053 | Multivariate Statistics*      | C             |
| 14 | STAT6115 | Statistical Quality Control   | C             |

\*) Tutorial & Multipaper