

## Statistics and Computer Science

### Introduction

Nowadays, all kinds of data are being generated when business processes are conducted or when enterprises interoperate. This vast amount of data is called as Big Data and it can be analysed using process-mining and data-mining techniques to understand how a business is performing and to identify new opportunities. The combination of Statistics and Computer Science into one program is designed to maximize the learning opportunities for the student in of handling Big Data, techniques for analyzing it, and simulation techniques for exploring the new business scenarios. This interdisciplinary study addresses the complexity of manipulating, analysing and using Big Data in business. The program can be completed within 4 - 4.5 years. Furthermore, to provide work experience for students, there are industrial internships, interesting research or entrepreneurship programs for 1 semester.

### Vision

A world class department in Computational Statistics based on ICT.

### Mission

The mission of Computer Science and Statistics 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 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.
4. To prepare students with abilities in problem solving and effective communication skills to be able to work independently or collaboratively in the digital world

### Student Outcomes

After completing the study, graduates are:

1. Able to create software application design by applying the principles of database system 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 technology trend in informatics area 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 can follow careers in:

1. Business analyst, DSS Manager, or business strategist
2. Actuary analyst, risk analyst, or quantitative credit analyst
3. Strategy consultant or evaluator of company performance
4. Data scientist, market researcher, or researcher of analysis techniques
5. Database designer, database administrator, or system analyst

### Curriculum

With reference to the Vision and Mission of Binus University, 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 student 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 Data Science.

Furthermore, besides this department provides the means and expertise in Data Science to prepare students for a career as a Data Scientist who is able to analyze any kind of data that emerges 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: <i>Pancasila</i>	2	20	
	COMP6047	Algorithm and Programming	4/2		
	MATH6025	Discrete Mathematics*	4		
	MATH6038	Calculus I	4		
	STAT6152	Introduction to Data Science**	2		
	<b>English University Courses I</b>				
	ENGL6128	English in Focus	2		
ENGL6130	English for Business Presentation	2			
2	CHAR6014	Character Building: <i>Kewarganegaraan</i>	2	20	
	COMP6048	Data Structures	4/2		

Sem	Code	Course Name	SCU	Total	
	MATH6030	Linear Algebra*	2		
	MATH6039	Calculus II*	4		
	STAT6175	Statistical Method for Data Science*&**	2		
	LANG6027	Indonesian	2		
	<b>English University Courses II</b>				
	ENGL6129	English Savvy	2		
	ENGL6131	English for Written Business Communication	2		
3	ENTR6509001	Entrepreneurship: Ideation	2	24	
	COMP6056049	Program Design Methods	4		
	COMP6708049	Object Oriented Programming	2/2		
	STAT6166049	Survey and Sampling Methods*	4		
	MATH6144049	Advanced Linear Algebra*	2		
	STAT6185049	Theory of Statistics I	4		
	STAT6047049	Numerical Methods for Statistics*&**	2		
	STAT6157049	Data Mining and Visualization*&**	2		
4	COMP6049049	Algorithm Design and Analysis	4	24	
	ISYS6169049	Database Systems	4/2		
	STAT6037049	Non Parametric Statistics	2		
	STAT6048049	Regression Analysis*	2/1		
	STAT6186049	Theory of Statistics II*	2		
	COMP6639049	Artificial Intelligence***	5		
	MATH6149049	Machine Learning*&**	2		
5	CHAR6015049	Character Building: <i>Agama</i>	2	24	
	COMP6176049	Human and Computer Interaction	2/2		
	CPEN6098049	Computer Networks	2/2		
	STAT6011049	Design and Analysis of Experiments*&**	4		
	STAT6044049	Categorical Data Analysis*	2		
	STAT6162049	Bayesian Data Analysis	2		
	MATH6165049	Deep Learning and Optimization Methods*	4		
	STAT6158049	Data Management and Organization	2		
6	COMP6640049	Software Engineering*&***	5	24	
	COMP6697049	Operating System	2		
	STAT6053049	Multivariate Statistics*&**	4		
	STAT6051049	Time Series Analysis*&**	2/1		
	STAT6036049	Stochastic Process*	4		
	MATH6178049	Text Mining	2		
	COMP6738049	Web Programming	2		
	STAT6159049	Big Data Infrastructure and Technology	2		
7	ENTR6511001	Entrepreneurship: Market Validation	2	20	
	COMP6062049	Compilation Techniques	4		
	RSCH6483049	Research Methodology in Data Science*	2		
	STAT6164049	Econometrics*&**	2		
	STAT6181049	Financial and Actuarial Science*	4		

Sem	Code	Course Name	SCU	Total
	MATH6166049	Data Security	2	
	<b>Free Elective</b>		4	
8	<b>Enrichment Program</b>		20	20
9	STAT6188049	Pre-Thesis	2	6
	STAT6189049	Thesis	4	
	STAT6030049	Thesis	6	
<b>TOTAL CREDITS 182 Credits</b>				

\*) This course is delivered in English

\*\*) Global Learning System Course

\*\*\*) Entrepreneurship Embedded

-) For Free Electives, students are required to choose from the list of Free Electives in Appendix.

### English University Courses:

-) For 1st Semester: English University Courses I, students with Binus University English Proficiency Test score less than 500 will take English in Focus, and student with test score greater than or equal to 500 will take English for Business Presentation.

-) For 2nd Semester: English University Courses II, students with Binus University English Proficiency Test score less than 500 will take English Savvy, and students with test score greater than or equal to 500 will take English for Written Business Communication.

-) Students should pass English Savvy with a minimum Grade is C.

**Pre-thesis (2 SCU) & Thesis (4 SCU)** can be taken in the 6th and/or 7th semester by the students who meet the requirements from the program.

### Appendix: Free Electives (4<sup>th</sup> Semester & 5<sup>th</sup> Semester)

No	Course Owner Department	Course Code	Course Name	SCU	Semester
1	Business Creation	ENTR6494005	Managing Growing Business	2	7
2	Business Management	MGMT6362005	Global Supply Chain Services	2	7
3	Business Management	MGMT6365005	Current Issue in Service Business and Technology	2	7
4	Business Management	MGMT6400005	Supply Chain Strategy	2	7
5	Global Business Marketing	MKTG6237005	Global Strategic Marketing: Asia Pacific Perspective	4	7
6	International Business Management	BUSS7009005	Export-Import Cost Management	2	7
7	International Business Management	MGMT6370005	E-Business for International Business	2	7
8	International Business Management	MGMT7169005	Global Supply Chain Management	2	7
9	Management	BUSS6069005	Business Simulation	2	7
10	Management	BUSS6163005	Organization Development Strategy	2	7
11	Management	BUSS6194005	Business Negotiation Strategy	2	7
12	Management	ISYS8175005	E-Business Strategy and Implementation	4	7
13	Management	MGMT6029005	Knowledge Management	2	7
14	Management	MGMT6063005	Strategic Management	2	7
15	Management	MGMT6145005	Compensation and Performance Management	2	7
16	Management	MGMT6297005	Operations Management	4	7
17	Management	MGMT6341005	Strategic Management	4	7
18	Management	MGMT6412005	Customer Relationship Management	2	7

No	Course Owner Department	Course Code	Course Name	SCU	Semester
19	Global Business Management	MKTG6272005	Marketing Research	2/2	7
20	Global Business Management	MKTG6294005	Branding & Omnichannel Retailing	4	7
21	Accounting Bekasi	ACCT6389020	Big Data Analytics in Accounting & Finance	2	7
22	Finance	FINC6189020	Introduction to Financial Market and Fin-Tech	2	7
23	Marketing Communication	COMM6514019	Editing for Creative Program	2/2	7
24	Marketing Communication	COMM6523019	Corporate Event Management	2/2	7
25	Marketing Communication	COMM6538019	Media Promotion & Marketing in Creative Broadcasting	2	7
26	Marketing Communication	COMM6539019	Media Convergence in Creative Broadcasting	2	7
27	Marketing Communication	COMM6541019	Digital Corporate Communication	2/2	7
28	Marketing Communication	COMM6542019	Event Management for Brand	2/2	7
29	Marketing Communication	COMM6543019	Digital Brand Communicaton	2/2	7
30	Tourism	TRSM6141022	Tourism Destination and Planning Management	4	7
31	Tourism	TRSM6160022	Tourism Transportation	2	7
32	Tourism	TRSM6208022	Tourism Innovation and Product Development	4	7
33	Tourism	TRSM6196022	Tourism Community Empowerment	2	7
34	Architecture	ARCH6047014	Behavior in Architecture	2	7
35	Architecture	ARCH6061014	Sustainable Architecture	2	7
36	Civil Engineering	CIVL6007013	Harbour Engineering	2	7
37	Civil Engineering	CIVL6009013	Urban Drainage	2	7
38	Civil Engineering	CIVL6015013	Geosynetics Application in Civil Engineering	2	7
39	Civil Engineering	CIVL6025013	Hydrology	2	7
40	Civil Engineering	CIVL6035013	Airport Engineering	2	7
41	Civil Engineering	CIVL6037013	Railway Engineering	2	7
42	Civil Engineering	CIVL6080013	Construction Methods & Heavy Equipment	2	7
43	Civil Engineering	CIVL8038013	Soil Improvement Method	2	7
44	Civil Engineering	CIVL8056013	Bridge Engineering	2	7
45	Civil Engineering	COMP6046013	Computer Applications in Construction Management	2	7
46	Computer Engineering	CPEN6098010	Computer Networks	2/2	7
47	Computer Engineering	CPEN6126010	Cross Platform Application Development	4	7
48	Computer Engineering	CPEN6225010	Telco Network & Switching System	2	7
49	Computer Engineering	CPEN6232010	Cloud Technology Practice	2	7
50	Food Tech	FOOD6062015	Food Quality Assurance System	2/1	7
51	Food Tech	FOOD6063015	Food Safety & Sanitation	2/1	7
52	Industrial Engineering	ISYE6067011	Global Supply Chain	2	7
53	Industrial Engineering	ISYE6115011	Transportation Modeling	2	7
54	Industrial Engineering	ISYE6130011	Project Management	2	7
55	Animation	DSGN6689007	Concept Art & Production Design	2	7

No	Course Owner Department	Course Code	Course Name	SCU	Semester
56	Animation	DSGN6690007	Animation Storytelling	2	7
57	Creative Advertising	DSGN6661007	Photography	4	7
58	Creative Advertising	DSGN6732007	Photography	4	7
59	Film	FILM6059009	Global Cinema	4	7
60	Business Information Technology	ISYS6579003	Knowledge-Based AI: Cognitive Systems	4	7
61	Information Systems	ISYS6196003	Business Analytics	2	7
62	Information Systems	ISYS6202003	Social Informatics	4	7
63	Information Systems	ISYS6289003	Collaborative Computing	4	7
64	Information Systems	ISYS8066003	Business Process Management	4	7
65	Information Systems Accounting & Audit	ISYS6608003	IT Service & Risk Management	2	7
66	Information Systems Accounting & Audit	ISYS6050003	Information System Audit Fundamental	4	7
67	Cyber Security	COMP6646001	Computer Forensic	2	7
68	International Relations	INTR6151029	Regional Integration in Europe	2	7
69	International Relations	INTR6152029	Regional Integration in America	2	7
70	International Relations	INTR6153029	Regional Integration in East Asia	2	7
71	International Relations	INTR6154029	Regional Integration in Africa and Middle East	2	7
72	International Relations	INTR6161029	Political Economy of Global Media	2	7
73	International Relations	INTR6162029	Multiculturalism and Digital Society	2	7
74	International Relations	INTR6167029	International Political Economy of Multinational Corporations	2	7
75	International Relations	INTR6169029	International Migration: Governance and Rights	2	7
76	International Relations	INTR8049029	Global Economic Architecture	2	7
77	Japanese Literature	JAPN6116025	Japanese Corporate Culture and Management (Nihon No Kigyuu Bunka to Manejimento)	2	7
78	Japanese Literature	JAPN6145025	Japanese Grammar I (Bunpou I)	4	7
79	Japanese Literature	JAPN6148025	Japanese Letter I (Kanji I)	2	7
80	Japanese Literature	JAPN6149025	Reading Comprehension I (Dokkai I)	2	7
81	Japanese Literature	JAPN6150025	Ideas and Images of Japanese Culture (Nihon Bunka Aidea to Imeeji)	2	7
82	Japanese Literature	JAPN6173025	Contemporary Japanese Society Through Various Perspective (Nihon Shakai e no Kangaekata)	2	7
83	Japanese Literature	JAPN6111025	Introductory Japanese I	4	7
84	Business Law	LAWS6052028	Bankruptcy Law	2	7
85	Business Law	LAWS6056028	Legal Research Methods	2	7
86	Business Law	LAWS6167028	Legal Philosophy & Professional Ethics	2	7
87	Business Law	LAWS6172028	Environmental and Natural Resources Law	2	7
88	Business Law	LAWS6174028	Contract & Legislative Drafting	2	7
89	Business Law	LAWS6176028	Tax Law	2	7
90	Chinese Literature	CHIN6157026	Chinese Business for Etiquette (Beginner)	4	7
91	Chinese Literature	CHIN6158026	Chinese Business in Daily Communication	4	7

No	Course Owner Department	Course Code	Course Name	SCU	Semester
92	Chinese Literature	CHIN6159026	Chinese Character Writing	2	7
93	English Literature	ENGL6158024	Writing for Children and Young Adults	2	7
94	English Literature	ENGL6244024	Social Media Broadcasting	4	7
95	Primary Teacher Education	EDUC6032030	Art & Craft	2	7
96	Primary Teacher Education	EDUC6033030	Physical Education	2	7
97	Primary Teacher Education	EDUC6037030	Teaching English for Young Learners	2	7
98	Primary Teacher Education	EDUC6061030	ICT for Distance Learning	2	7
99	Primary Teacher Education	EDUC8004030	School Based Management	2	7
100	Psychology	PSYC6127027	Indigenous Psychology	4	7

**Enrichment Program (8<sup>th</sup> Semester):**

-) Student will take one of enrichment program tracks (off campus). See enrichment appendix for the tracks detail.

**Enrichment Track Scheme**

Track	Semester 8						
	IN	RS	EN	CD	SA	IS	etc
1	v						
2		v					
3			v				
4				v			
5					v		
6						v	

**Note:**

IN : Certified Internship  
 RS : Certified Research  
 EN : Certified Entrepreneurship  
 CD : Certified Community Development  
 SA : Certified Study Abroad  
 IS : Certified Specific Independent Study  
 etc : Study Program Special Purposes

**Description:**

Student will take one of enrichment program tracks

**Certified Internship Track**

Code	Course Name	SCU	Total
STAT6090049	Internship	8	20
STAT6191049	Data Analysis and Statistical Program in Industry	8	
STAT6093049	EES in Statistics Industry	4	

**Certified Entrepreneurship Track**

Code	Course Name	SCU	Total
ENTR6641049	Product Launching in Statistics	8	20
ENTR6642049	Business Development in Statistics	8	
ENTR6208049	EES in Statistics	4	

**Certified Research Track**

Code	Course Name	SCU	Total
RSCH6225049	Research Experience	8	20

RSCH6531049	Scientific Writing in Statistics	8	
RSCH6157049	Global EES in Statistics	4	

### Certified Community Development Track

Code	Course Name	SCU	Total
CMDV6125049	Community Outreach Project Implementation	8	20
CMDV6313049	Community Outreach in Statistics Project Design	8	
CMDV6075049	Employability and Entrepreneurial Skills in Statistics	4	

### Certified Study Abroad Track

Code	Course Name	SCU	Total
<b>Elective courses list for study abroad*</b>			20
GLOB6005049	Elective Course for Study Abroad 1	4	
GLOB6006049	Elective Course for Study Abroad 2	4	
GLOB6007049	Elective Course for Study Abroad 3	4	
GLOB6008049	Elective Course for Study Abroad 4	4	
GLOB6009049	Elective Course for Study Abroad 5	2	
GLOB6010049	Elective Course for Study Abroad 6	2	
GLOB6011049	Elective Course for Study Abroad 7	2	
GLOB6012049	Elective Course for Study Abroad 8	2	
GLOB6013049	Elective Course for Study Abroad 9	2	
GLOB6014049	Elective Course for Study Abroad 10	2	
GLOB6015049	Elective Course for Study Abroad 11	2	
GLOB6016049	Elective Course for Study Abroad 12	2	
GLOB6251049	Elective Course for Study Abroad 29	4	

\*) Transferred courses will be transferred based on credit transfer policies on study program with total of 20 credits.

### Certified Specific Independent Study

Code	Course Name	SCU	Total
<b>Elective courses list for certified specific independent study*</b>			20
MICR6033049	Course Certification I	3	
MICR6034049	Technical Skill Enrichment I	4	
MICR6035049	Industrial Project I	9	
MICR6036049	Soft Skill Enrichment I	4	
MICR6001049	Elective Course for Specific Independent Study 1	8	
MICR6002049	Elective Course for Specific Independent Study 2	8	
MICR6003049	Elective Course for Specific Independent Study 3	6	
MICR6004049	Elective Course for Specific Independent Study 4	6	
MICR6005049	Elective Course for Specific Independent Study 5	6	
MICR6006049	Elective Course for Specific Independent Study 6	5	
MICR6007049	Elective Course for Specific Independent Study 7	5	
MICR6008049	Elective Course for Specific Independent Study 8	5	
MICR6009049	Elective Course for Specific Independent Study 9	5	
MICR6010049	Elective Course for Specific Independent Study 10	4	
MICR6011049	Elective Course for Specific Independent Study 11	4	

Code	Course Name	SCU	Total
MICR6012049	Elective Course for Specific Independent Study 12	4	
MICR6013049	Elective Course for Specific Independent Study 13	4	
MICR6014049	Elective Course for Specific Independent Study 14	4	
MICR6015049	Elective Course for Specific Independent Study 15	3	
MICR6016049	Elective Course for Specific Independent Study 16	3	
MICR6017049	Elective Course for Specific Independent Study 17	3	
MICR6018049	Elective Course for Specific Independent Study 18	3	
MICR6019049	Elective Course for Specific Independent Study 19	3	
MICR6020049	Elective Course for Specific Independent Study 20	3	
MICR6021049	Elective Course for Specific Independent Study 21	2	
MICR6022049	Elective Course for Specific Independent Study 22	2	
MICR6023049	Elective Course for Specific Independent Study 23	2	
MICR6024049	Elective Course for Specific Independent Study 24	2	
MICR6025049	Elective Course for Specific Independent Study 25	2	
MICR6026049	Elective Course for Specific Independent Study 26	2	
MICR6027049	Elective Course for Specific Independent Study 27	2	
MICR6028049	Elective Course for Specific Independent Study 28	2	
MICR6029049	Elective Course for Specific Independent Study 29	1	
MICR6030049	Elective Course for Specific Independent Study 30	1	
MICR6031049	Elective Course for Specific Independent Study 31	1	
MICR6032049	Elective Course for Specific Independent Study 32	1	

\*) For students who take BINUS certified specific independent study courses, they should take the first 4 courses on the list above (20 credits). Meanwhile, electives courses 1 to 32 are transferred courses for students who take certified specific independent study outside BINUS University. Transferred courses will be transferred based on credit transfer policies on study program with total of 20 credits.

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

No	Course Code	Course Name	Minimal Grade
1.	CHAR6013	Character Building: <i>Pancasila</i>	B
2.	ENTR6511001	Entrepreneurship: Market Validation	C
3.	COMP6047	Algorithm and Programming*	C
4.	STAT6152	Introduction to Data Science	C
5.	COMP6048	Data Structures*	C
6.	STAT6185049	Theory of Statistics I*	C
7.	STAT6157049	Data Mining and Visualization	C
8.	STAT6048049	Regression Analysis*	C
9.	COMP6639049	Artificial Intelligence	C
10.	MATH6149049	Machine Learning	C
11.	STAT6044049	Categorical Data Analysis	C
12.	MATH6165049	Deep Learning and Optimization Methods	C
13.	COMP6640049	Software Engineering*	C
14.	STAT6053049	Multivariate Statistics*	C

\*) Tutorial & Multipaper