

Computer Science Global Class

Introduction

In the new millennium and the global era, the role of information and automation in the various domains and activities of the business industry are becoming more important. The successes of the activities are determined by how computer science can support in managing the information. Information must be up-to-date, accurate and comprehensive to allow decision makers to determine the enterprise's strategy. Furthermore, automation can facilitate human activity, accelerate the pace of work and make it more effective and efficient, while also increasing productivity in various activities. The development of communication and computer technology has made it possible to get information that is rapid, exact, and accurate. It also increases the application of automation in various fields such as industry, business, office affairs and development of science and technology.

The Computer Science Program was founded in September 1987, under STMIK Bina Nusantara; it became one of the programs under the coordination of the Faculty of Computer Science, Bina Nusantara University in December 1998.

Computer Science Program at Bina Nusantara University emphasizes the processes, techniques, and tools that go into developing computer-based systems, with specialities in intelligent systems, software engineering, multimedia technology, database systems and network technology.

Vision

A study program of choice in Computer Science which focuses on developing creative software solutions for industry, is recognized internationally, champions innovation and delivers graduates with international qualifications.

Mission

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

1. Educating students with fundamental and advance knowledge, skill and practice in software development specialized in database technology, intelligence system, networking or multimedia and game development by providing an excellent learning environment and promoting research and collaboration with global industry;
2. Providing IT professional services with emphasis in application of knowledge in terms of society development;
3. Sharing application of knowledge related to computer science for Indonesian and international community quality of life improvement;
4. Promoting students & lecturers to be creative and value-addings talents in computer science by creating suitable environment in order to be able to compete in international level;
5. Preparing students for becoming smart and good ICT professionals, leaders and entrepreneurs in global market or for continuing in advanced studies.

Program Objective

The objectives of the program are:

1. To provide students with a solid foundation of mathematical, algorithm principles, computer science knowledge and ethical that will be needed in IT practice;
2. To provide students with skills to apply design and development principles in the construction of software system applied in database technology, intelligence system, networking and multimedia development;

3. To prepare students with abilities to keep up-to-date with the latest Information Technology trends, developments and industries;
4. To prepare students with abilities in problem solving and good communication skills to be able to work as an individual or in a team in an IT environment.

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 solutions based on problems analysis which can be solved with structured approach in informatics area;
3. Able to assess technology trend in informatics area to deliver alternative solutions of software development;
4. Able to produce software applications which can solve the problems in informatics;
5. Able to produce database software with high complexity to solve problems;
6. Able to produce smart software using artificial intelligence algorithms to solve problems;
7. Able to apply interdisciplinary knowledge and skills in developing alternative solutions for problem-solving.

Prospective Career of the Graduates

After finishing the program, the graduate of Computer Science Program could follow a career as:

1. Software Engineer/Developer
2. System Analyst/Developer
3. Web Engineer/Developer
4. Computer Network Specialist
5. Database Specialist
6. Artificial Intelligence Specialist
7. Data Scientist
8. IT Support/Consultant
9. Researcher
10. Multimedia Programmer
11. Lecturer/Trainer

Curriculum

The curriculum of the Computer Science Program has been developed in line with the National Curriculum. Also, the local content has been developed in line with the Computer Science Curriculum standard of ACM (Association for Computing Machinery), several local and foreign universities, and market trends, so that the graduates of the Computer Science Program are expected to be able to face competition at both a national and international level. Generally, the subjects of the curriculum 2020 are divided into these following groups of subjects:

Mathematics Group (Science)

The objective of this group is to provide an understanding of mathematics as one of the principal foundations of computer science. Another objective is to give an understanding of scientific methodology (data collection, hypothesis, research, analysis) in problem solving.

Character Building Group (Professional Practices)

The objective of this group is to develop the personal strengths of the student and to provide him or her with a professional character, professionalism in their field, management skills, oral and written communication skills, understanding of business ethic, ability to work as a team, and to develop a “Binusian” Character.

Core Group

The objective of this group is to provide a grounding in Computer Science through practice as well as applied theory which is required by business both now and in the future. The subjects that are included in this group are programming, algorithm design and analysis, software engineering, databases systems, computer graphics, multimedia technology, human and computer interaction, operation systems, computer architecture, and computer network.

Entrepreneur and Employability Skill

The objective of this group of subject is to prepare students with professional experience, work ethics and to experience the working environment. The students are expected to apply and to practice their knowledge in the real working area such as industry, research lab, and also an entrepreneur startup. They are also expected to give reports as the result of the subjects.

Course Structure

| Sem | Code | Course Name | SCU | Total |
|-----|-------------|--|-----|-------|
| 1 | CHAR6013 | Character Building: <i>Pancasila</i> | 2 | 20 |
| | MATH6025 | Discrete Mathematics | 4 | |
| | MATH6030 | Linear Algebra | 2 | |
| | COMP6047 | Algorithm and Programming** | 4/2 | |
| | COMP6056 | Program Design Methods** | 4 | |
| | ENGL6132 | English Access | 2 | |
| 2 | CHAR6014 | Character Building: <i>Kewarganegaraan</i> | 2 | 20 |
| | COMP6048 | Data Structures** | 4/2 | |
| | MATH6031 | Calculus | 4 | |
| | ENTR6509 | Entrepreneurship: Ideation | 2 | |
| | COMP6176 | Human and Computer Interaction | 2/2 | |
| | ENGL6133 | English Global | 2 | |
| 3 | CHAR6015001 | Character Building: <i>Agama</i> | 2 | 23 |
| | COMP6049001 | Algorithm Design and Analysis | 4 | |
| | ISYS6169001 | Database Systems | 4/2 | |
| | CPEN6098001 | Computer Networks | 2/2 | |
| | COMP6639001 | Artificial Intelligence*** | 5 | |
| | ENGL6134001 | English for Academic Writing | 2 | |
| 4 | COMP6696001 | Research Methodology in Computer Science | 2 | 18 |
| | COMP6640001 | Software Engineering* ^g *** | 5 | |
| | STAT6171001 | Basic Statistics | 2 | |
| | COMP7084001 | Multimedia Systems** | 2/1 | |
| | COMP6745001 | Machine Learning | 2 | |
| | COMP6708001 | Object Oriented Programming** | 2/2 | |

| Sem | Code | Course Name | SCU | Total |
|----------------------------------|---|-------------------------------------|-----|-------|
| 5 | COMP6681001 | Web Programming** | 2/1 | 19 |
| | COMP6062001 | Compilation Techniques | 4 | |
| | COMP6697001 | Operating System | 2 | |
| | ENTR6511001 | Entrepreneurship: Market Validation | 2 | |
| | COMP6746001 | Data Mining | 2 | |
| | LANG6027001 | Indonesian | 2 | |
| | Free Electives | | 4 | |
| 6 | Elective courses list for study abroad | | | 20 |
| | GLOB6029001 | Elective Course 1 | 4 | |
| | GLOB6030001 | Elective Course 2 | 4 | |
| | GLOB6031001 | Elective Course 3 | 4 | |
| | GLOB6032001 | Elective Course 4 | 4 | |
| | GLOB6033001 | Elective Course 5 | 2 | |
| | GLOB6034001 | Elective Course 6 | 2 | |
| | GLOB6035001 | Elective Course 7 | 2 | |
| | GLOB6036001 | Elective Course 8 | 2 | |
| | GLOB6037001 | Elective Course 9 | 2 | |
| | GLOB6038001 | Elective Course 10 | 2 | |
| | GLOB6039001 | Elective Course 11 | 2 | |
| | GLOB6040001 | Elective Course 12 | 2 | |
| 7 | Enrichment Program | | 20 | 20 |
| 8 | COMP6747001 | Pre-Thesis | 2 | 6 |
| | COMP6748001 | Thesis | 4 | |
| | COMP6861001 | Thesis | 6 | |
| TOTAL CREDITS 146 Credits | | | | |

*) Global Learning System Course

**) Entrepreneurship Embedded

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

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 (5th Semester)

| No | Course Owner Department | Course Code | Course Name | SCU | Semester |
|----|-----------------------------------|-------------|--|-----|----------|
| 1 | Business Creation | ENTR6494005 | Managing Growing Business | 2 | 5 |
| 2 | Business Management | MGMT6365005 | Current Issue in Service Business and Technology | 2 | 5 |
| 3 | International Business Management | MGMT6370005 | E-Business for International Business | 2 | 5 |
| 4 | Management | ISYS8175005 | E-Business Strategy and Implementation | 4 | 5 |
| 5 | Management | MGMT6029005 | Knowledge Management | 2 | 5 |
| 6 | Management | MGMT6063005 | Strategic Management | 2 | 5 |
| 7 | Management | MGMT6297005 | Operations Management | 4 | 5 |
| 8 | Management | MGMT6341005 | Strategic Management | 4 | 5 |
| 9 | Accounting Bekasi | ACCT6389020 | Big Data Analytics in Accounting & Finance | 2 | 5 |

| No | Course Owner Department | Course Code | Course Name | SCU | Semester |
|----|---------------------------------|-------------|--|-----|----------|
| 10 | Marketing Communication | COMM6541019 | Digital Corporate Communication | 2/2 | 5 |
| 11 | Marketing Communication | COMM6543019 | Digital Brand Communicaton | 2/2 | 5 |
| 12 | Tourism | TRSM6208022 | Tourism Innovation and Product Development | 4 | 5 |
| 13 | Architecture | ARCH6128014 | Multimedia in Design Presentation | 4 | 5 |
| 14 | Architecture | ARCH6132014 | Leadership Organization Behavior | 4 | 5 |
| 15 | Civil Engineering | CIVL6025013 | Hydrology | 2 | 5 |
| 16 | Civil Engineering | CIVL6035013 | Airport Engineering | 2 | 5 |
| 17 | Civil Engineering | CIVL6037013 | Railway Engineering | 2 | 5 |
| 18 | Civil Engineering | CIVL6080013 | Construction Methods & Heavy Equipment | 2 | 5 |
| 19 | Civil Engineering | COMP6046013 | Computer Applications in Construction Management | 2 | 5 |
| 20 | Computer Engineering | CPEN6126010 | Cross Platform Application Development | 4 | 5 |
| 21 | Computer Engineering | CPEN6225010 | Telco Network & Switching System | 2 | 5 |
| 22 | Computer Engineering | CPEN6232010 | Cloud Technology Practice | 2 | 5 |
| 23 | Business Law | LAWS6052028 | Bankruptcy Law | 2 | 5 |
| 24 | Business Law | LAWS6167028 | Legal Philosophy & Professional Ethics | 2 | 5 |
| 25 | Business Law | LAWS6176028 | Tax Law | 2 | 5 |
| 26 | English Literature | SOCS6021024 | Social and Digital Media Writing | 2 | 5 |
| 27 | English Literature | ENGL6244024 | Social Media Broadcasting | 4 | 5 |
| 28 | International Relations | INTR6162029 | Multiculturalism and Digital Society | 2 | 5 |
| 29 | Primary Teacher Education | EDUC6033030 | Physical Education | 2 | 5 |
| 30 | Primary Teacher Education | EDUC6061030 | ICT for Distance Learning | 2 | 5 |
| 31 | Psychology | PSYC6123027 | Educational Psychology | 2 | 5 |
| 32 | Computer Science | COMP6226001 | Competitive Programming | 2 | 5 |
| 33 | Computer Science | COMP7116001 | Computer Vision | 2/2 | 5 |
| 34 | Computer Science | COMP6736001 | Distributed Cloud Computing | 2 | 5 |
| 35 | Computer Science | COMP6586001 | Embedded Systems | 2 | 5 |
| 36 | Computer Science | COMP6578001 | Information Visualization | 2 | 5 |
| 37 | Computer Science | MOBI6059001 | Mobile Programming | 2 | 5 |
| 38 | Cyber Security | COMP6646001 | Computer Forensic | 2 | 5 |
| 39 | Statistics | STAT6158001 | Data Management and Organization | 2 | 5 |
| 40 | Mobile Application & Technology | MOBI6059001 | Mobile Programming | 2 | 5 |
| 41 | Statistics | RSCH6483001 | Research Methodology in Data Science | 2 | 5 |
| 42 | Mobile Application & Technology | MOBI6057001 | Wearable Technology | 2 | 5 |
| 43 | Business Information Technology | ISYS6579003 | Knowledge-Based AI: Cognitive Systems | 4 | 5 |
| 44 | Information Systems | ISYS6196003 | Business Analytics | 2 | 5 |

| No | Course Owner Department | Course Code | Course Name | SCU | Semester |
|----|---|-------------|------------------------------|-----|----------|
| 45 | Information Systems | ISYS6199003 | Data & Text Mining | 4 | 5 |
| 46 | Information Systems | ISYS6202003 | Social Informatics | 4 | 5 |
| 47 | Information Systems | ISYS6289003 | Collaborative Computing | 4 | 5 |
| 48 | Information Systems | ISYS6402003 | Business Analytics | 2/2 | 5 |
| 49 | Information Systems | ISYS8066003 | Business Process Management | 4 | 5 |
| 50 | Information Systems Accounting & Auditing | ISYS6608003 | IT Service & Risk Management | 2 | 5 |

Elective courses list for Study Abroad (6th Semester):

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

Enrichment Program (7th Semester):

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

Enrichment Track Scheme

| Track | Semester 6 | | | | | | Semester 7 | | | | | | | |
|-------|------------|----|----|----|----|-----|------------|----|----|----|----|----|----|-----|
| | IN | RS | EN | CD | SA | etc | IN | RS | EN | CD | SA | IS | FS | etc |
| 1 | | | | | v | | | v | | | | | | |
| 2 | | | | | v | | | | | | v | | | |
| 3 | | | | | v | | | | | | | v | | |
| 4 | | | | | v | | | | | | | | v | |
| 5 | | | | | v | | | | | | | | | |

Note:

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

Description:

Student will take one of enrichment program tracks

Certified Internship Track

| Code | Course Name | SCU | Total |
|-------------|--|-----|-------|
| COMP6426001 | Industrial Experience in Information Technology | 8 | 20 |
| COMP6762001 | Information Technology Practice in Industrial Experience | 8 | |
| COMP6514001 | EES in Information Technology Industry | 4 | |

Certified Community Development Track

| Code | Course Name | SCU | Total |
|-------------|--|-----|-------|
| CMDV6159001 | Community Outreach Project Implementation | 8 | 20 |
| CMDV6343001 | Community Outreach IT Project Design | 8 | |
| CMDV6208001 | Employability and Entrepreneurial Skills in Computer Science Community | 4 | |

Certified Study Abroad Track*

| Code | Course Name | SCU | Total |
|-------------|-------------------------------------|-----|-------|
| GLOB6017001 | Elective Course for Study Abroad 13 | 4 | 20 |
| GLOB6018001 | Elective Course for Study Abroad 14 | 4 | |
| GLOB6019001 | Elective Course for Study Abroad 15 | 4 | |
| GLOB6020001 | Elective Course for Study Abroad 16 | 4 | |
| GLOB6021001 | Elective Course for Study Abroad 17 | 2 | |
| GLOB6022001 | Elective Course for Study Abroad 18 | 2 | |
| GLOB6023001 | Elective Course for Study Abroad 19 | 2 | |
| GLOB6024001 | Elective Course for Study Abroad 20 | 2 | |
| GLOB6025001 | Elective Course for Study Abroad 21 | 2 | |
| GLOB6026001 | Elective Course for Study Abroad 22 | 2 | |
| GLOB6027001 | Elective Course for Study Abroad 23 | 2 | |
| GLOB6028001 | Elective Course for Study Abroad 24 | 2 | |
| GLOB6253001 | Elective Course for Study Abroad 31 | 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 |
|--|---|-----|-------|
| Elective courses list for certified specific independent study* | | | 20 |
| MICR6033001 | Course Certification I | 3 | |
| MICR6034001 | Technical Skill Enrichment I | 4 | |
| MICR6035001 | Industrial Project I | 9 | |
| MICR6036001 | Soft Skill Enrichment I | 4 | |
| MICR6001001 | Elective Course for Specific Independent Study 1 | 8 | |
| MICR6002001 | Elective Course for Specific Independent Study 2 | 8 | |
| MICR6003001 | Elective Course for Specific Independent Study 3 | 6 | |
| MICR6004001 | Elective Course for Specific Independent Study 4 | 6 | |
| MICR6005001 | Elective Course for Specific Independent Study 5 | 6 | |
| MICR6006001 | Elective Course for Specific Independent Study 6 | 5 | |
| MICR6007001 | Elective Course for Specific Independent Study 7 | 5 | |
| MICR6008001 | Elective Course for Specific Independent Study 8 | 5 | |
| MICR6009001 | Elective Course for Specific Independent Study 9 | 5 | |
| MICR6010001 | Elective Course for Specific Independent Study 10 | 4 | |
| MICR6011001 | Elective Course for Specific Independent Study 11 | 4 | |
| MICR6012001 | Elective Course for Specific Independent Study 12 | 4 | |
| MICR6013001 | Elective Course for Specific Independent Study 13 | 4 | |
| MICR6014001 | Elective Course for Specific Independent Study 14 | 4 | |
| MICR6015001 | Elective Course for Specific Independent Study 15 | 3 | |
| MICR6016001 | Elective Course for Specific Independent Study 16 | 3 | |
| MICR6017001 | Elective Course for Specific Independent Study 17 | 3 | |
| MICR6018001 | Elective Course for Specific Independent Study 18 | 3 | |
| MICR6019001 | Elective Course for Specific Independent Study 19 | 3 | |
| MICR6020001 | Elective Course for Specific Independent Study 20 | 3 | |

| Code | Course Name | SCU | Total |
|-------------|---|-----|-------|
| MICR6021001 | Elective Course for Specific Independent Study 21 | 2 | |
| MICR6022001 | Elective Course for Specific Independent Study 22 | 2 | |
| MICR6023001 | Elective Course for Specific Independent Study 23 | 2 | |
| MICR6024001 | Elective Course for Specific Independent Study 24 | 2 | |
| MICR6025001 | Elective Course for Specific Independent Study 25 | 2 | |
| MICR6026001 | Elective Course for Specific Independent Study 26 | 2 | |
| MICR6027001 | Elective Course for Specific Independent Study 27 | 2 | |
| MICR6028001 | Elective Course for Specific Independent Study 28 | 2 | |
| MICR6029001 | Elective Course for Specific Independent Study 29 | 1 | |
| MICR6030001 | Elective Course for Specific Independent Study 30 | 1 | |
| MICR6031001 | Elective Course for Specific Independent Study 31 | 1 | |
| MICR6032001 | 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.

Further Study Track

| Code | Course Name | SCU | Total |
|--|--|-----|-------|
| Enrichment Program II (Master of Management Information Systems: Information Systems Strategic Management Stream) | | | 20 |
| ISYS6829001 | Digital Technology and Transformation | 4 | |
| ISYS6830001 | Data Analytics for Business | 6 | |
| ISYS6831001 | Applied Technology in Information Systems* | 4 | |
| ISYS6806001 | Strategic Planning for Information Systems | 6 | |
| Enrichment Program II (Master of Management Information Systems: Digitalpreneurship Stream) | | | |
| ISYS6829001 | Digital Technology and Transformation | 4 | |
| ISYS6830001 | Data Analytics for Business | 6 | |
| ISYS6831001 | Applied Technology in Information Systems* | 4 | |
| ISYS6848001 | New Media Ventures and Innovation | 6 | |
| Enrichment Program II (Master of Computer Science: Data Science Stream) | | | 20 |
| COMP6816001 | Wireless and Cloud Computing Technologies | 4 | |
| COMP6997001 | IT Disaster Recovery | 6 | |
| COMP6981001 | Applied Technology in Computer Science* | 4 | |
| COMP6998001 | Knowledge Engineering | 6 | |
| Enrichment Program II (Master of Computer Science: Information Security Management) | | | |
| COMP6816001 | Wireless and Cloud Computing Technologies | 4 | |
| COMP6997001 | IT Disaster Recovery | 6 | |
| COMP6981001 | Applied Technology in Computer Science* | 4 | |
| COMP6980001 | Networking and Security Concepts | 6 | |

*) Students are required to obtain certification no later than the end of the first semester of the master's (S2) program, as outlined in the university's official guidelines. This certification will be transferred as an undergraduate (S1) course and reported in the seventh semester of the undergraduate program.

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. | COMP6056 | Program Design Methods* | C |
| 5. | COMP6048 | Data Structures* | C |
| 6. | COMP6640001 | Software Engineering* | C |
| 7. | COMP6746001 | Data Mining | C |
| 8. | COMP6745001 | Machine Learning | C |

*) Tutorial & Multipaper