

## Industrial Engineering

### Introduction

Industrial Engineering is a branch of engineering that engages in the study of how to describe, evaluate, design, modify, control, and improve the performance of integrated systems of people, materials, and technology, viewed over time and within their relevant context. Industrial engineering is unique in its blend of fundamental topics in mathematics, physical and engineering sciences knowledge with the principles and methods of engineering analysis and design. This field identifies human being as central contributors to the inherent complexity of such systems. Globalization has opened up more doors for service industries worldwide, which leads to an increased demand for industrial engineers. The Industrial Engineering curriculum at BINUS UNIVERSITY is structured to adapt the movement of globalization and tailored to the needs of the globalized world.

The study program emphasizes the application of engineering fundamentals with a balanced treatment of theory, design, and experience. Computer applications are integrated throughout the curriculum. Industrial Engineering department allows flexibility to its students to study certain topics in breadth and depth by offering three tracks: Supply Chain Engineering, Service Systems Engineering, and Manufacturing Systems Engineering.

Some of the core courses require the students to not only having a full grasp of the theoretical aspects but also on how to implement them in a time study analysis. The Industrial Engineering facilities are well-equipped in the areas of engineering graphics, industrial engineering systems design, and human performance. The laboratories are available for students to use during their study are but not limited to: Physics Lab, Manufacturing Process Lab, Technical Drawing Lab, Simulation Lab, Work Design, and Ergonomics Lab.

### Vision

Becoming a world class industrial engineering study program through advanced system and industrial digital transformation to fostering and empowering the society in building and serving the nation

### Mission

The missions of Industrial Engineering Department are:

1. Developing excellent characters through holistic approach that meets global standards
2. Resolving the nation's issues in Industrial Engineering field study through high impact research
3. Fostering BINUSIAN as lifelong learners through self-enrichment in adapting to new system engineering and technology
4. Empowering BINUSIAN to continuously serve society-based needs through industrial engineering applied technology
5. Being the main driver to enrich the BINUS Higher Education system by using Industrial Engineering knowledge and technology.

### Program Objectives

The objectives of the program are to:

1. Utilize appropriate engineering design methods and tools that are principal to work beneficially within their professions & communities.
2. Possess effective teamwork and leadership skills and commit to the standard of profession and ethical practice.
3. Continuously develop oneself to meet the evolving demands and increasing responsibilities of a successful career, to benefit the organization and society.

## Student Outcomes

After completing the study, graduates are:

1. Able to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. Able to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. Able to communicate effectively with a range of audiences
4. Able to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. Able to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. Able to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. Able to acquire and apply new knowledge as needed, using appropriate learning strategies

## Prospective Career of the Graduates

Industrial engineers are employed in manufacturing and service industries. The type of works industrial engineers are doing are but not limited to:

1. Manufacturing Industry: Inventory Management, Logistics, Operation Management, Production Management, and Warehousing.
2. Research and Development: Data Analysis, Environmental Protection and Preservation, and Human Factors Engineering.
3. Service Industry: Client Management, Commercial Banking and Real Estate, Financial Consulting, Health Systems, and Human Resource Consulting.
4. Business and Management: Business Strategy, Investment Banking, Management Analysis, Project Management, and Business Development.
5. Education: Teaching and Research, consulting.
6. Information Technology: Computer Integration, Database Design, Telecommunication, and Web Development.

## Curriculum

Industrial Engineering Program is about designing, modifying, controlling, and improving complex systems.

Therefore, a strong basis in the “queen of the sciences”, better known as mathematics, and computer science is a must in modeling and solving such complex systems. The Industrial Engineering curriculum is structured in such a way that the students should master the following scientific fields: mathematics, physics, humanities/social sciences, computer science and management, general engineering sciences, industrial engineering core, lab sciences, professional engineering practice, and industrial engineering specialization.

**Course Structure**

| Sem | Code  | Course Name                              | SCU | Total |
|-----|---|--|-----|-------|
| 1   | CHAR6013011                                 | Character Building: Pancasila            | 2   | 20    |
|     | SCIE6004011                                 | Physics I                                | 4   |       |
|     | SCIE6051011                                 | Chemistry                                | 3   |       |
|     | MATH6014011                                 | Calculus I                               | 4   |       |
|     | ENGR6093011                                 | Technical Drawing**                      | 2/1 |       |
|     | SCIE6017011                                 | Biology                                  | 2   |       |
|     | ISYE6245011                                 | Industrial Economy and Accounting        | 2   |       |
|     | <b>Foreign Language Courses</b>             |  | 0   |       |
| 2   | CHAR6014011                                 | Character Building: Kewarganegaraan      | 2   | 20    |
|     | LANG6027011                                 | Indonesian                               | 2   |       |
|     | SCIE6061011                                 | Physics II                               | 4/1 |       |
|     | MATH6016011                                 | Calculus II                              | 4   |       |
|     | STAT6003011                                 | Probability Theory                       | 2   |       |
|     | ISYE6181011                                 | System Engineering & Analysis**          | 2   |       |
|     | ISYE6157011                                 | Human-Integrated Systems                 | 2/1 |       |
|     | <b>Foreign Language Courses</b>             |  | 0   |       |
| 3   | CHAR6015011                                 | Character Building: Agama                | 2   | 20    |
|     | MATH6004011                                 | Linear and Discrete Mathematics          | 4   |       |
|     | MATH6019011                                 | Calculus III                             | 4   |       |
|     | STAT6172011                                 | Applied Statistics                       | 2   |       |
|     | ISYE6158011                                 | Engineering Data Analysis                | 3   |       |
|     | ISYE6123011                                 | Deterministic Optimization*&**           | 3   |       |
|     | ENTR6509001                                 | Entrepreneurship: Ideation               | 2   |       |
|     | <b>Foreign Language Courses</b>             |  | 0   |       |
| 4   | ISYE6207011                                 | Stochastic Processes                     | 2   | 20    |
|     | ENTR6510001                                 | Entrepreneurship: Prototyping            | 2   |       |
|     | ISYE6041011                                 | Engineering Economy**                    | 2   |       |
|     | ISYE6186011                                 | Production & Operation Analysis**        | 3/1 |       |
|     | ISYE6113011                                 | Leadership & Organizational Behavior*&** | 2   |       |
|     | ISYE6300011                                 | Facility Planning and Safety Engineering | 4   |       |
|     | ISYE6182011                                 | Supply Chain: Logistics*                 | 2   |       |
|     | ISYE6248011                                 | Industry 4.0 and Implementation          | 2   |       |
|     | <b>Foreign Language Courses</b>             |  | 0   |       |
| 5   | ENTR6511001                                 | Entrepreneurship: Market Validation      | 2   | 20    |
|     | ISYE6163011                                 | Research Methodology                     | 2   |       |
|     | ISYE6125011                                 | Quality Engineering**                    | 3   |       |
|     | ISYE6185011                                 | Systems Simulation**                     | 3   |       |
|     | <b>Stream : Supply Chain Engineering</b>    |  |     |       |
|     | ISYE6164011                                 | E-Supply Chain Management                | 2/1 |       |
|     | ISYE6183011                                 | Warehouse Management Systems             | 2   |       |
|     | ISYE6301011                                 | Data Science: Machine Learning           | 3   |       |
|     | <b>Stream : Service Systems Engineering</b> |  |     |       |
|     | ISYE6166011                                 | Dynamic Service Facility Design          | 2/1 |       |
|     |   |  |     |       |

| Sem                         | Code   | Course Name                          | SCU | Total |
|-----------------------------|--|--------------------------------------|-----|-------|
|                             | ISYE6066011  | Human Interaction in Service Systems | 2   |       |
|                             | ISYE6302011  | E-Service and Usability Engineering  | 3   |       |
|                             | <b>Stream : Manufacturing Systems</b>                                  |                                      |     |       |
|                             | ISYE6184011  | Manufacturing Processes              | 2/1 |       |
|                             | ENGR6005011  | Mechanics of Materials               | 2   |       |
|                             | ISYE6303011  | Smart Manufacturing                  | 3   |       |
|                             | <b>Elective Supply Chain Engineering Courses***</b>                    |                                      |     |       |
|                             | ISYE6067011  | Global Supply Chain*                 | 2   |       |
|                             | ISYE6165011  | Supply Chain Risk & Negotiation      | 2   |       |
|                             | ISYE6115011  | Transportation Modeling              | 2   |       |
|                             | <b>Elective Service Systems Engineering Courses***</b>                 |                                      |     |       |
|                             | MKTG6128011  | Market Research                      | 2   |       |
|                             | ISYE6167011  | Decision Support System              | 2   |       |
|                             | ISYE6168011  | Financial Engineering*               | 2   |       |
|                             | <b>Elective Manufacturing Systems Courses***</b>                       |                                      |     |       |
|                             | ISYE6130011  | Project Management                   | 2   |       |
|                             | ISYE6169011  | Maintenance Management Systems       | 2   |       |
|                             | ISYE6170011  | Sustainable Engineering Systems*     | 2   |       |
|                             | <b>Streaming: Industrial Digital Transformation<sup>1)</sup></b>       |                                      |     |       |
|                             | ISYE6305054  | Digital Transformation Strategies    | 3   |       |
|                             | ISYE6306054  | Digitalization Product Development   | 2   |       |
|                             | <b>Elective Industrial Digital Transformation Courses<sup>2)</sup></b> |                                      |     |       |
|                             | <b>Elective Group-1</b>  |                                      |     |       |
|                             | ISYE6307054  | Digital Logistics Management*&***    | 2/1 |       |
|                             | ISYE6267054  | Warehouse & Inventory Systems        | 2   |       |
|                             | ISYE6308054  | Procurement Principles               | 2   |       |
|                             | ISYE6269054  | Sustainable Supply Chain Engineering | 2   |       |
|                             | ISYE6268054  | Data Science: Machine Learning.      | 2   |       |
|                             | ISYE6257054  | Industrial 4.0 & Implementation      | 2   |       |
|                             | <b>Elective Group-2</b>  |                                      |     |       |
|                             | ISYE6271054  | Sustainable Service Engineering      | 2   |       |
|                             | ISYE6272054  | Service Innovation & Globalization   | 2   |       |
|                             | ISYE6309054  | E-Services & Usability Engineering   | 2/1 |       |
|                             | ISYE6310054  | E-Customer Relationship Management   | 2   |       |
|                             | ISYE6311054  | Project Management                   | 2   |       |
|                             | ISYE6312054  | Lean Enterprise System               | 2   |       |
|                             | <b>Minor Program</b>   |                                      | 10  |       |
|                             | <b>Free Electives</b>  |                                      | 10  |       |
| 6                           | <b>Enrichment Program I</b>  |                                      | 20  | 20    |
| 7                           | <b>Enrichment Program II</b>   |                                      | 20  | 20    |
| 8                           | ISYE6205011  | Pre – Thesis                         | 2   | 6     |
|                             | ISYE6206011  | Thesis                               | 4   |       |
|                             | ISYE6171011  | Thesis                               | 6   |       |
| <b>TOTAL CREDIT 146 SCU</b> |  |                                      |     |       |

\*) This course is delivered in English

\*\*\*) Entrepreneurship Embedded

\*\*\*) Global Learning System Course

#### Streaming/Free Electives:

-) For 5<sup>th</sup> Semester: Students are required to choose Streaming or Minor or Free Electives. For Free Electives, students are required to choose from the list of Free Electives in Appendix.

#### 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

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

#### Appendix Foreign Language Courses

| Foreign Language Courses |                               | SCU |
|--------------------------|-------------------------------|-----|
| ENGL6253010              | English for Frontrunners      | 0   |
| ENGL6254010              | English for Independent Users | 0   |
| ENGL6255010              | English for Professionals     | 0   |
| JAPN6190010              | Basic Japanese Language       | 0   |
| CHIN6163010              | Basic Chinese Language        | 0   |

\*) This course is optional for students

1. Students with Binus University English Proficiency Test score less than 437 are required to take English for Frontrunners and English for Independent Users.
2. Students with Binus University English Proficiency Test score less than 520 are required to take English for Independent Users and English for Professionals.
3. Students with Binus University English Proficiency Test score equal to or greater than 520 are required to take English for Professionals. Additionally, students may choose to take either Basic Japanese Language or Basic Chinese Language.
4. Students are required to pass the foreign language courses before they take enrichment.
5. Students can see the requirements to pass the foreign language courses at BINUSMAYA – Beelingua.

### Minor Scheme

| Minor Program                         | Semester 4 |
|---------------------------------------|------------|
| <b>Minor @ Binus Kemanggisan</b>      |            |
| Digital Ecosystem                     | v          |
| Sustainable Development               | v          |
| Cross Cultural Communication          | v          |
| Interactive & Users Experience Design | v          |
| Data Analytics                        | v          |
| Robotic Process Automation            | v          |
| <b>Minor @ Binus Alam Sutera</b>      |            |
| Digital Transformation                | v          |
| <b>Minor @ Binus Bekasi</b>           |            |
| Virtual Services Experience           | v          |
| Culinary                              | v          |
| <b>Minor @ Binus Semarang</b>         |            |
| Metaverse in Business                 | v          |

The minor programs can change anytime based on the trends of knowledge and industry each year. Students will receive information about the updated minor programs during the registration period.

### 1. Digital Ecosystem

#### Fundamental Courses

| Course  | SCU       |
|---|-----------|
| COMP6683001 Introduction to Artificial Intelligence | 2/2       |
| ISYS6549003 Digital Innovation                      | 4         |
| COMP6937001 Current Trends in Technology            | 2         |
| <b>Total SCU</b>                                    | <b>10</b> |

### 2. Sustainable Development

#### Fundamental Courses

| Course  | SCU       |
|---|-----------|
| ISYE6154011 Sustainable Design and Manufacture      | 4         |
| CPEN6217010 Digital for Sustainable Development     | 4         |
| ARCH6119014 Introduction to Sustainable Development | 2         |
| <b>Total SCU</b>                                    | <b>10</b> |

### 3. Cross Cultural Communication

#### Fundamental Courses

| Course   | SCU       |
|--|-----------|
| CHIN6132026 Chinese Conversation in Daily Activities | 4         |
| COMM6502019 Communication in Diversity               | 2         |
| BUSS6170025 Asian Business Ethics                    | 4         |
| <b>Total SCU</b>                                     | <b>10</b> |

### 4. Interactive & Users Experience Design

#### Fundamental Courses

| Course  | SCU       |
|---|-----------|
| ISYS6553003 User-Centered Research and Evaluation | 4         |
| PSYC6176027 Psychology and User Experience        | 4         |
| DSIN6003007 Fundamental of Interface Design       | 2         |
| <b>Total SCU</b>                                  | <b>10</b> |

### 5. Data Analytics

#### Fundamental Courses

| Course  | SCU       |
|---|-----------|
| ISYS6680003 Introduction to Data Analytics          | 2         |
| ISYS6681003 Data Management & Descriptive Analytics | 4         |
| STAT6198049 Statistical for Decision Making         | 4         |
| <b>Total SCU</b>                                    | <b>10</b> |

### 6. Robotic Process Automation

#### Fundamental Courses

| Course                                       | SCU       |
|--|-----------|
| COMP6857001 Basic Programming for Automation | 2         |
| COMP6858001 RPA Concept & Design             | 2         |
| ISYS6684003 RPA Developer Fundamental        | 4         |
| ISYS6687003 Business Process Improvement     | 2         |
| <b>Total SCU</b>                             | <b>10</b> |

### 7. Digital Transformation

#### Fundamental Courses

| Course  | SCU       |
|---|-----------|
| ISYS6559003 Business Models and Technology Innovation | 4         |
| ISYS6557003 Business Data Management                  | 4         |
| MGMT6484005 Digital Strategy                          | 2         |
| <b>Total SCU</b>                                      | <b>10</b> |

## 8. Virtual Services Experience

### Fundamental Courses

| Course   | SCU       |
|--|-----------|
| ISYS6561003 Fundamental of Virtual Services    | 2         |
| ACCT6350020 Virtual Financial Services         | 4         |
| MGMT6354005 Virtual Operation and Supply Chain | 4         |
| <b>Total SCU</b>                               | <b>10</b> |

## 9. Culinary

### Fundamental Courses

| Course                                   | SCU       |
|--|-----------|
| HTMN6108021 Food and Beverage Management | 2         |
| HTMN6008021 Kitchen Operation            | 4         |
| HTMN6128021 Pastry and Bakery Operation  | 4         |
| <b>Total SCU</b>                         | <b>10</b> |

## 10. Metaverse in Business

### Fundamental Courses

| Course                        | SCU       |
|-------------------------------|-----------|
| ISYS6777052 Business Model    | 2         |
| COMP6889051 Virtual Reality   | 4         |
| COMP6890051 Augmented reality | 4         |
| <b>Total SCU</b>              | <b>10</b> |

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

| No | Course Owner Department           | Course Code | Course Name                                | SCU | Semester |
|----|-----------------------------------|-------------|--|-----|----------|
| 1  | Business Management               | MGMT6400005 | Supply Chain Strategy                      | 2   | 5        |
| 2  | Business Management               | MGMT6459005 | Retail Management                          | 4   | 5        |
| 3  | Business Management               | MGMT6460005 | Retail Supply Chain Management             | 2   | 5        |
| 4  | Global Business Marketing         | MKTG6321005 | Marketing Data Analytics                   | 4   | 5        |
| 5  | Global Business Marketing         | MKTG6322005 | Sales and Customer Relationship Management | 4   | 5        |
| 6  | International Business Management | MGMT6357005 | Multinational Corporation Management       | 4   | 5        |
| 7  | Industrial Engineering            | ISYE6067011 | Global Supply Chain                        | 2   | 5        |
| 8  | Industrial Engineering            | ISYE6165011 | Supply Chain Risk & Negotiation            | 2   | 5        |
| 9  | Industrial Engineering            | ISYE6115011 | Transportation Modeling                    | 2   | 5        |
| 10 | Industrial Engineering            | ISYE6168011 | Financial Engineering                      | 2   | 5        |
| 11 | Industrial Engineering            | ISYE6130011 | Project Management                         | 2   | 5        |
| 12 | Industrial Engineering            | ISYE6169011 | Maintenance Management Systems             | 2   | 5        |

| No | Course Owner Department         | Course Code | Course Name                                    | SCU | Semester |
|----|---------------------------------|-------------|--|-----|----------|
| 13 | Food Technology                 | FOOD6074015 | Food Processing Technology II                  | 2   | 5        |
| 14 | Food Technology                 | CPEN6235015 | IoT in Food Industry                           | 2   | 5        |
| 15 | Computer Science                | COMP6800001 | Human and Computer Interaction                 | 2/1 | 5        |
| 16 | Computer Science                | COMP6586001 | Embedded Systems                               | 2   | 5        |
| 17 | Computer Science                | COMP6144001 | Web Programming                                | 2/1 | 5        |
| 18 | Computer Science                | COMP6590001 | Geographical Information System                | 2/2 | 5        |
| 19 | Computer Science                | ISYS6197001 | Business Application Development               | 2/2 | 5        |
| 20 | Tourism                         | TRSM6142022 | Event Management                               | 4   | 5        |
| 21 | Tourism                         | TRSM6218022 | Adventure Tourism Management                   | 4   | 5        |
| 22 | Tourism                         | TRSM6221022 | Sport Tourism                                  | 2   | 5        |
| 23 | Tourism                         | BUSS6137022 | Tourism E-Business                             | 4   | 5        |
| 24 | Tourism                         | MGMT6408022 | Strategic Management for Tourism               | 2   | 5        |
| 25 | Hotel Management                | HTMN6027021 | Service Management                             | 4   | 5        |
| 26 | Hotel Management                | HTMN6146021 | Food Safety Management                         | 2   | 5        |
| 27 | Hotel Management                | HTMN6147021 | Hospitality Management                         | 4   | 5        |
| 28 | Hotel Management                | HTMN6001021 | Introduction to Hospitality                    | 4   | 5        |
| 29 | Hotel Management                | HTMN6108021 | Food and Beverage Management                   | 2   | 5        |
| 30 | Accounting                      | ACCT6461020 | Accounting Syariah                             | 2   | 5        |
| 31 | Accounting                      | ACCT6462020 | Audit Psychology                               | 2   | 5        |
| 32 | Finance                         | FINC6189020 | Introduction to Financial Market and Fin-Tech  | 2   | 5        |
| 33 | Data Science                    | DTSC6006001 | Machine Learning                               | 2/1 | 5        |
| 34 | Mobile Application & Technology | MOBI6068001 | Web Design                                     | 2   | 5        |
| 35 | Mobile Application & Technology | MOBI6070001 | Embedded System and Internet of Things         | 3   | 5        |
| 36 | Mobile Application & Technology | MOBI6059001 | Mobile Programming                             | 2   | 5        |
| 37 | Statistics                      | STAT6157049 | Data Mining and Visualization                  | 2   | 5        |
| 38 | Information Systems             | ISYS6196003 | Business Analytics                             | 2   | 5        |
| 39 | Information Systems             | ISYS6289003 | Collaborative Computing                        | 4   | 5        |
| 40 | Information Systems             | ISYS6402003 | Business Analytics                             | 2/2 | 5        |
| 41 | Business Information Technology | ISYS6579003 | Knowledge-Based AI: Cognitive Systems          | 4   | 5        |
| 42 | International Relations         | INTR6151029 | Regional Integration in Europe                 | 2   | 5        |
| 43 | International Relations         | INTR6152029 | Regional Integration in America                | 2   | 5        |
| 44 | International Relations         | INTR6153029 | Regional Integration in East Asia              | 2   | 5        |
| 45 | International Relations         | INTR6154029 | Regional Integration in Africa and Middle East | 2   | 5        |
| 46 | Chinese Literature              | CHIN6157026 | Chinese Business for Etiquette (Beginner)      | 4   | 5        |
| 47 | Chinese Literature              | CHIN6158026 | Chinese Business in Daily Communication        | 4   | 5        |
| 48 | Chinese Literature              | CHIN6159026 | Chinese Character Writing                      | 2   | 5        |
| 49 | Business Law                    | LAWS6110028 | Cyber Law                                      | 2   | 5        |
| 50 | Business Law                    | LAWS6159028 | Legal Aspect in Business                       | 2   | 5        |
| 51 | Business Law                    | LAWS6170028 | Investment Law                                 | 2   | 5        |
| 52 | Business Law                    | LAWS6174028 | Contract & Legislative Drafting                | 2   | 5        |
| 53 | Business Law                    | LAWS6176028 | Tax Law  | 2   | 5        |
| 54 | Psychology                      | PSYC6130027 | Human Performance Technology                   | 4   | 5        |

| No | Course Owner Department | Course Code | Course Name  | SCU | Semester |
|----|-------------------------|-------------|--|-----|----------|
| 55 | Psychology              | PSYC6191027 | E-Learning Psychology                                      | 4   | 5        |
| 56 | Japanese Literature     | JAPN6151025 | Reflection of Japanese Experience (Nihon Keiken no Han'ei) | 2   | 5        |
| 57 | Japanese Literature     | JAPN6162025 | Japanese Literary Criticism (Nihon Bungaku Hyouron)        | 2   | 5        |
| 58 | Japanese Literature     | JAPN6111025 | Introductory Japanese I                                    | 4   | 5        |
| 59 | Japanese Literature     | JAPN6145025 | Japanese Grammar I (Bunpou I)                              | 4   | 5        |
| 60 | Japanese Literature     | JAPN6148025 | Japanese Letter I (Kanji I)                                | 2   | 5        |
| 61 | Japanese Literature     | JAPN6149025 | Reading Comprehension I (Dokkai I)                         | 2   | 5        |

### Enrichment Program I (6<sup>th</sup> Semester) & Enrichment Program II (7<sup>th</sup> Semester):

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

### Enrichment Track Scheme

| Semester 6 |    |    |    |    |    |    |     | Semester 7 |    |    |    |    |    |    |     |
|------------|----|----|----|----|----|----|-----|------------|----|----|----|----|----|----|-----|
| Track      | IN | RS | EN | CD | SA | IS | etc | IN         | RS | EN | CD | SA | IS | FS | etc |
| 1          | v  |    |    |    |    |    |     | v          |    |    |    |    |    |    |     |
| 2          |    | v  |    |    |    |    |     | v          |    |    |    |    |    |    |     |
| 3          |    |    |    | v  |    |    |     | v          |    |    |    |    |    |    |     |
| 4          |    |    |    |    | v  |    |     | v          |    |    |    |    |    |    |     |
| 5          |    |    |    |    |    | v  |     | v          |    |    |    |    |    |    |     |
| 6          | v  |    |    |    |    |    |     |            |    |    |    |    |    | v  |     |
| 7          |    | v  |    |    |    |    |     |            |    |    |    |    |    | v  |     |
| 8          |    |    |    | v  |    |    |     |            |    |    |    |    |    | v  |     |
| 9          |    |    |    |    | v  |    |     |            |    |    |    |    |    | v  |     |
| 10         |    |    |    |    |    | v  |     |            |    |    |    |    |    | v  |     |
| 11         | v  |    |    |    |    |    |     |            | v  |    |    |    |    |    |     |
| 12         |    | v  |    |    |    |    |     |            | v  |    |    |    |    |    |     |
| 13         |    |    |    | v  |    |    |     |            | v  |    |    |    |    |    |     |
| 14         |    |    |    |    | v  |    |     |            | v  |    |    |    |    |    |     |
| 15         |    |    |    |    |    | v  |     |            | v  |    |    |    |    |    |     |
| 16         | v  |    |    |    |    |    |     |            |    |    |    | v  |    |    |     |
| 17         |    | v  |    |    |    |    |     |            |    |    |    | v  |    |    |     |
| 18         |    |    |    | v  |    |    |     |            |    |    |    | v  |    |    |     |
| 19         |    |    |    |    | v  |    |     |            |    |    |    | v  |    |    |     |
| 20         |    |    |    |    |    | v  |     |            |    |    |    | v  |    |    |     |
| 21         | v  |    |    |    |    |    |     |            |    |    |    |    | v  |    |     |
| 22         |    | v  |    |    |    |    |     |            |    |    |    |    | v  |    |     |
| 23         |    |    |    | v  |    |    |     |            |    |    |    |    | v  |    |     |
| 24         |    |    |    |    | v  |    |     |            |    |    |    |    | v  |    |     |
| 25         |    |    | v  |    |    |    |     |            |    | 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 |
|------------------------------|--------------------------------------|-----|-------|
| <b>Enrichment Program I</b>  |                                      |     | 20    |
| ISYE6208011                  | Industrial Practice I                | 8   |       |
| ISYE6210011                  | Engineering Ethics and Competence I  | 8   |       |
| ISYE6212011                  | EES in Industrial Engineering I      | 4   |       |
| <b>Enrichment Program II</b> |                                      |     | 20    |
| ISYE6209011                  | Industrial Practice II               | 8   |       |
| ISYE6211011                  | Engineering Ethics and Competence II | 8   |       |
| ISYE6213011                  | EES in Industrial Engineering II     | 4   |       |

**Certified Entrepreneurship Track**

| Code                         | Course Name                            | SCU | Total |
|------------------------------|--|-----|-------|
| <b>Enrichment Program I</b>  |  |     | 20    |
| ENPR6214011                  | New Venture Industrial Initiation      | 8   |       |
| ENPR6215011                  | Industrial Product Development Process | 8   |       |
| ENPR6216011                  | EES in New Industrial Business I       | 4   |       |
| <b>Enrichment Program II</b> |  |     | 20    |
| ENPR6218011                  | Industrial Product Launching           | 8   |       |
| ENPR6219011                  | Industrial Business Development        | 8   |       |
| ENPR6217011                  | EES in New Industrial Business II      | 4   |       |

**Certified Research Track**

| Code                         | Course Name                                     | SCU | Total |
|------------------------------|---|-----|-------|
| <b>Enrichment Program I</b>  |   |     | 20    |
| RSCH6701011                  | Research Experience I                           | 8   |       |
| RSCH6703011                  | Scientific Writing in Industrial Engineering I  | 8   |       |
| RSCH6705011                  | Global EES in Industrial Engineering I          | 4   |       |
| <b>Enrichment Program II</b> |   |     | 20    |
| RSCH6702011                  | Research Experience II                          | 8   |       |
| RSCH6704011                  | Scientific Writing in Industrial Engineering II | 8   |       |
| RSCH6706011                  | Global EES in Industrial Engineering II         | 4   |       |

**Certified Community Development Track**

| Code                        | Course Name  | SCU | Total |
|-----------------------------|--|-----|-------|
| <b>Enrichment Program I</b> |  |     | 20    |
| CMDV6459011                 | Community Outreach Project Implementation I                          | 8   |       |
| CMDV6461011                 | Design Project I   | 8   |       |
| CMDV6463011                 | Employability and Entrepreneurial Skills in Industrial Engineering I | 4   |       |

**Certified Study Abroad Track**

| Code                                    | Course Name                         | SCU | Total |
|---|-------------------------------------|-----|-------|
| Elective courses list for study abroad* |                                     |     | 20    |
| Enrichment Program I                    |                                     |     |       |
| GLOB6005011                             | Elective Course for Study Abroad 1  | 4   |       |
| GLOB6006011                             | Elective Course for Study Abroad 2  | 4   |       |
| GLOB6007011                             | Elective Course for Study Abroad 3  | 4   |       |
| GLOB6008011                             | Elective Course for Study Abroad 4  | 4   |       |
| GLOB6009011                             | Elective Course for Study Abroad 5  | 2   |       |
| GLOB6010011                             | Elective Course for Study Abroad 6  | 2   |       |
| GLOB6011011                             | Elective Course for Study Abroad 7  | 2   |       |
| GLOB6012011                             | Elective Course for Study Abroad 8  | 2   |       |
| GLOB6013011                             | Elective Course for Study Abroad 9  | 2   |       |
| GLOB6014011                             | Elective Course for Study Abroad 10 | 2   |       |
| GLOB6015011                             | Elective Course for Study Abroad 11 | 2   |       |
| GLOB6016011                             | Elective Course for Study Abroad 12 | 2   |       |
| GLOB6249011                             | Elective Course for Study Abroad 27 | 3   |       |
| GLOB6250011                             | Elective Course for Study Abroad 28 | 3   |       |
| GLOB6251011                             | Elective Course for Study Abroad 29 | 4   |       |
| Enrichment Program II                   |                                     |     | 20    |
| GLOB6017011                             | Elective Course for Study Abroad 13 | 4   |       |
| GLOB6018011                             | Elective Course for Study Abroad 14 | 4   |       |
| GLOB6019011                             | Elective Course for Study Abroad 15 | 4   |       |
| GLOB6020011                             | Elective Course for Study Abroad 16 | 4   |       |
| GLOB6021011                             | Elective Course for Study Abroad 17 | 2   |       |
| GLOB6022011                             | Elective Course for Study Abroad 18 | 2   |       |
| GLOB6023011                             | Elective Course for Study Abroad 19 | 2   |       |
| GLOB6024011                             | Elective Course for Study Abroad 20 | 2   |       |
| GLOB6025011                             | Elective Course for Study Abroad 21 | 2   |       |
| GLOB6026011                             | Elective Course for Study Abroad 22 | 2   |       |
| GLOB6027011                             | Elective Course for Study Abroad 23 | 2   |       |
| GLOB6028011                             | Elective Course for Study Abroad 24 | 2   |       |
| GLOB6041011                             | Elective Course for Study Abroad 25 | 3   |       |
| GLOB6252011                             | Elective Course for Study Abroad 30 | 3   |       |
| GLOB6253011                             | 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    |
| Enrichment Program I/II   |   |     |       |
| CSIS6001011   | Course Certification                              | 3   |       |
| CSIS6002011   | Technical Skill Enrichment                        | 4   |       |
| CSIS6003011   | Industrial Project                                | 9   |       |
| CSIS6004011   | Soft Skill Enrichment                             | 4   |       |
| CSIS6005011   | Elective Course for Specific Independent Study 1  | 8   |       |
| CSIS6006011   | Elective Course for Specific Independent Study 2  | 8   |       |
| CSIS6007011   | Elective Course for Specific Independent Study 3  | 6   |       |
| CSIS6008011   | Elective Course for Specific Independent Study 4  | 6   |       |
| CSIS6009011   | Elective Course for Specific Independent Study 5  | 6   |       |
| CSIS6010011   | Elective Course for Specific Independent Study 6  | 5   |       |
| CSIS6011011   | Elective Course for Specific Independent Study 7  | 5   |       |
| CSIS6012011   | Elective Course for Specific Independent Study 8  | 5   |       |
| CSIS6013011   | Elective Course for Specific Independent Study 9  | 5   |       |
| CSIS6014011   | Elective Course for Specific Independent Study 10 | 4   |       |
| CSIS6015011   | Elective Course for Specific Independent Study 11 | 4   |       |
| CSIS6016011   | Elective Course for Specific Independent Study 12 | 4   |       |
| CSIS6017011   | Elective Course for Specific Independent Study 13 | 4   |       |
| CSIS6018011   | Elective Course for Specific Independent Study 14 | 4   |       |
| CSIS6019011   | Elective Course for Specific Independent Study 15 | 3   |       |
| CSIS6020011   | Elective Course for Specific Independent Study 16 | 3   |       |
| CSIS6021011   | Elective Course for Specific Independent Study 17 | 3   |       |
| CSIS6022011   | Elective Course for Specific Independent Study 18 | 3   |       |
| CSIS6023011   | Elective Course for Specific Independent Study 19 | 3   |       |
| CSIS6024011   | Elective Course for Specific Independent Study 20 | 3   |       |
| CSIS6025011   | Elective Course for Specific Independent Study 21 | 2   |       |
| CSIS6026011   | Elective Course for Specific Independent Study 22 | 2   |       |
| CSIS6027011   | Elective Course for Specific Independent Study 23 | 2   |       |
| CSIS6028011   | Elective Course for Specific Independent Study 24 | 2   |       |
| CSIS6029011   | Elective Course for Specific Independent Study 25 | 2   |       |
| CSIS6030011   | Elective Course for Specific Independent Study 26 | 2   |       |
| CSIS6031011   | Elective Course for Specific Independent Study 27 | 2   |       |
| CSIS6032011   | Elective Course for Specific Independent Study 28 | 2   |       |
| CSIS6033011   | Elective Course for Specific Independent Study 29 | 1   |       |
| CSIS6034011   | Elective Course for Specific Independent Study 30 | 1   |       |
| CSIS6035011   | Elective Course for Specific Independent Study 31 | 1   |       |
| CSIS6036011   | 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

For students who take the Master of Industrial Engineering Study Program through the Enrichment Further Study track, the courses that have been taken in semester 1 can be equivalent to the following courses

| Code                         | Course Name                         | SCU | Total |
|------------------------------|-------------------------------------|-----|-------|
| <b>Enrichment Program II</b> |                                     |     | 20    |
| ISYE6227011                  | Engineering System and Optimization | 6   |       |
| ISYE6228011                  | System Simulation and Modeling      | 6   |       |
| ISYE6226011                  | Industrial Design Project           | 8   |       |

For students who take the Master of Management Study Program (Stream Business Management) through the Enrichment Further Study track, the courses that have been taken in semester 1 can be equivalent to the following courses:

| Code                         | Course Name                         | SCU | Total |
|------------------------------|-------------------------------------|-----|-------|
| <b>Enrichment Program II</b> |                                     |     | 20    |
| ENTR6561011                  | Design Thinking for Innovation      | 4   |       |
| MKTG6299011                  | Business Negotiation                | 4   |       |
| MKTG6300011                  | Marketing Strategy                  | 4   |       |
| STAT6212011                  | Statistics for Engineers            | 4   |       |
| MGMT6420011                  | Human Resources Management Strategy | 4   |       |

For students who take the Master of Management Study Program (Stream Creative Marketing) through the Enrichment Further Study track, the courses that have been taken in semester 1 can be equivalent to the following courses:

| Code                         | Course Name                          | SCU | Total |
|------------------------------|--------------------------------------|-----|-------|
| <b>Enrichment Program II</b> |                                      |     | 20    |
| ENTR6561011                  | Design Thinking for Innovation       | 4   |       |
| MKTG6299011                  | Business Negotiation                 | 4   |       |
| MKTG6300011                  | Marketing Strategy                   | 4   |       |
| ACCT6474011                  | Accounting and Finance for Engineers | 4   |       |
| MGMT6420011                  | Human Resources Management Strategy  | 4   |       |

**The Table of Prerequisite for Management Program**

| Course      |                                 | SCU | Sem | Course Prerequisite |                            | SCU | Sem |
|-------------|---------------------------------|-----|-----|---------------------|----------------------------|-----|-----|
| MATH6019011 | Calculus III                    | 4   | 3   | MATH6014011         | Calculus I                 | 4   | 1   |
| ISYE6207011 | Stochastic Processes            | 2   | 4   | STAT6003011         | Probability Theory         | 2   | 2   |
| ISYE6186011 | Production & Operation Analysis | 3/1 | 4   | ISYE6123011         | Deterministic Optimization | 3   | 3   |
| ISYE6125011 | Quality Engineering             | 3   | 5   | STAT6172011         | Applied Statistics         | 2   | 3   |

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

| No. | Course Code | Course Name                              | Minimal Grade |
|-----|-------------|--|---------------|
| 1.  | CHAR6013011 | Character Building: Pancasila            | B             |
| 2.  | ISYE6157011 | Human-Integrated Systems                 | C             |
| 3.  | ISYE6123011 | Deterministic Optimization*              | C             |
| 4.  | ISYE6186011 | Production & Operation Analysis*         | C             |
| 5.  | ISYE6300011 | Facility Planning and Safety Engineering | C             |
| 6.  | ISYE6041011 | Engineering Economy                      | C             |
| 7.  | ISYE6125011 | Quality Engineering*                     | C             |
| 8.  | ENTR6511001 | Entrepreneurship: Market Validation      | C             |

\*) Tutorial & Multipaper