Industrial Engineering

Introduction

Industrial Engineering program 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.

Industrial Engineering program emphasizes the application of engineering fundamentals with a balanced treatment of theory, design, and experience. Computer applications are integrated throughout the curriculum. This program allows flexibility to its students to study certain topics in breadth and depth by offering Supply Chain Engineering. The specialization of Supply Chain Engineering covers how modern production and operations management techniques can respond to the pressures of the competitive global marketplace by integrating all activities in the supply chain, adding flexibility to the system and reducing production cost.

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-machine integration. 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 online learning industrial engineering study program in 2035 to fostering and empowering the society in building and serving the nation

Mission

The mission of Distance Learning Program in Industrial Engineering is to contribute to the global community through the provision of world-class education by:

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 knowledge and technology

Program Objective

The objectives of the program are:

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 will have the following competencies an ability to:

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.
8. Able to solve problems through the multidisciplinary approach

Prospective Career of the Graduates

Industrial engineers are employed in manufacturing and service industries. Several career options for industrial engineers include, are but not limited to, the following:

1. Production/Operation Engineer
2. Quality Assurance Engineer
3. Supply Chain Engineer
4. Data Engineer
5. System Analyst
6. Product Spesialist
7. Service Engineer
8. Maintenance Engineer

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 requirement in modeling and solving such complex systems. The Distance Learning Program in 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	MATH6082037	Calculus I	4	20
	SCIE6057037	Chemistry and Biology	4	
	STAT6174037	Probability Theory and Applied Statistics	4	
	SCIE6069037	Physics	3/1	
	ISYE6187037	Engineering Economy and System Analysis	4	
2	CHAR6019037	Character Building: Pancasila	2	20
	MATH6094037	Calculus II	4	
	MATH6195037	Mathematics	4	
	ENGL6163037	English Professional	4	
	ENTR6081037	Entrepreneurship	4	
	LANG6031037	Indonesian	2	
3	CHAR6020037	Character Building: Kewarganegaraan	2	20
	ISYE6188037	Human-Integrated Systems	3/1	
	ENGR6094037	Technical Drawing	3/1	
	ISYE6194037	Environmental Engineering and Waste Management	4	
	ISYE6189037	Deterministic Optimization & Stochastic Processes	6	
4	ISYE6180037	Leadership & Organizational Behavior	2	20
	ISYE6094037	Quality Engineering	4	
	ISYE6178037	Systems Simulation & Engineering Data Analysis	6	
	ISYE6087037	Introduction to Manufacturing Processes	4	
	RSCH6497037	Research Methodology and Experimental Design	4	
5	CHAR6021037	Character Building: Agama	2	20
	ISYE6096037	Production & Operation Analysis	4/2	
	ISYE6190037	Facility Planning and Safety Engineering	4	
	Stream: Supply Chain Engineering			
	ISYE6090037	Supply Chain: Logistics	4	
	ISYE6236037	E-Supply Chain Management	3/1	
	Stream: Manufacturing System Engineering			
	ISYE6077037	Project Management	4	
	ISYE6237037	Sustainable Manufacturing Systems	3/1	

Sem	Code	Course Name	SCU	Total
6		**Minor Program**		20
		Free Electives		
		Enrichment Program I		
7		**Free Electives**		20
		Individual Development Project		
		Enrichment Program II		
8	RSCH6494037	Thesis	6	6
			Total Credit 146 SCU	

Semester 6 Students are required to choose Minor Program or Free Electives or Enrichment Program.
Semester7 Students are required to choose Free Electives or Individual Development Project or one of enrichment program tracks.

Track Scheme
Track scheme for semester 6 and 7. Student will take one of tracks

Track	Semester 6			Semester 7								
	MP	FE	IS	IN	EN	RS	CD	SA	IS	FS	IDP	FE
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		

26			v							v	
27			v								v

Note:

MP	: Minor Program	SA	: Certified Study Abroad
FE	: Free Electives	IDP	: Certified Individual Development Project
IS	: Certified Specific Independent Study	FS	: Further Study
IN	: Certified Internship		
EN	: Certified Entrepreneurship		
RS	: Certified Research		
CD	: Certified Community Development		

Minor Program
Semester 6

Minor Technopreneurship

Course		SCU
ACCT6384039	Accounting for Small Medium Enterprise	4
MKTG6296038	Digital Marketing for Manager	4
ISYS6619035	UX for Digital Business	4
COMP6725036	Big Data Technologies	4
ISYE6196037	Industrial Feasibility Analysis	4
Total SCU		20

Minor Artificial Intelligence in Business

Course		SCU
ISYS6776035	Managerial Support Systems	4
ACCT6473039	Artificial Intelligence for Audit, Forensic Accounting, and Valuation	4
COMP6936036	Machine Learning	4
MGMT6483038	AI Marketing and Predicting Consumer Experiences	4
ISYE6284037	Cognitive Ergonomics	4
Total SCU		20

Free Electives

Semester 6
For students who take free electives track in the 6th semester, the following is a list of courses that students can take for 20 credits

No	Study Program	Course Code	Course	SCU	Semester
1	Accounting PJJ	ACCT6130039	Cost Accounting	4	6
2	Information Systems PJJ	ISYS6305035	Enterprise System	4	6
3	Information Systems PJJ	ISYS6701035	User Experience Research and Design	4	6

4	Computer Science PJJ	COMP6742036	Algorithm Design and Analysis	4	6
5	Accounting PJJ	ACCT6384039	Accounting for Small Medium Enterprise	4	6
6	Management PJJ	MKTG6296038	Digital Marketing for Manager	4	6
7	Industrial Engineering PJJ	ISYE6196037	Industrial Feasibility Analysis	4	6
8	Information Systems PJJ	ISYS6776035	Managerial Support Systems	4	6
9	Management PJJ	MGMT6483038	AI Marketing and Predicting Consumer Experiences	4	6
10	Industrial Engineering PJJ	ISYE6284037	Cognitive Ergonomics	4	6
11	Industrial Engineering PJJ	ISYE6239037	Dynamic Service Facility Design	4	6
12	Industrial Engineering PJJ	ISYE6195037	Human Interaction in Service Systems	4	6
13	Industrial Engineering PJJ	ISYE6241037	Decision Support System	4	6
14	Industrial Engineering PJJ	ISYE6285037	Financial Engineering	4	6
15	Industrial Engineering PJJ	ISYE6286037	Market Research for Engineer	4	6
16	Computer Science PJJ	COMP6939036	Intelligent Multimedia Systems	2/2	6
17	Accounting PJJ	ACCT6481039	Corporate Strategy and Risk Management	4	6

Semester 7

For students who take free electives track in the 7th semester, the following is a list of courses that students can take for 20 credits

No	Study Program	Course Code	Course	SCU	Semester
1	Management PJJ	BUSS6049038	Managing Innovation	4	7
2	Information Systems PJJ	ISYS6783035	Social Informatics	6	7
3	Information Systems PJJ	ISYS6784035	IS Audit and Governance	6	7
4	Information Systems PJJ	ISYS6319035	Knowledge Management	4	7
5	Industrial Engineering PJJ	ISYE6287037	Industry 4.0 and Implementation	4	7
6	Industrial Engineering PJJ	ISYE6288037	Smart Manufacturing	4	7
7	Industrial Engineering PJJ	ISYE6289037	Manufacturing Execution Systems	6	7

8	Industrial Engineering PJJ	ISYE6290037	Digital Simulation and Manufacturing System	6	7
9	Computer Science PJJ	COMP6277036	Geographic Information System	2/2	7
10	Computer Science PJJ	COMP6941036	Data Mining for Business Analytics	4/2	7

Individual Development Project

For students who take Certified Individual Development Project in semester 7, they should take these courses:

Course		SCU
ISYE6292037	Industrial Project Planning in Industrial Engineering	6
ISYE6293037	Industrial Project Implementation in Industrial Engineering	4
ISYE6294037	Industrial Project Evaluation and Reporting in Industrial Engineering	6
ISYE6295037	Business Ethics in Industrial Engineering Industry	4
	Total SCU	**20**

Enrichment Track Scheme

Track scheme for semester 6 and 7. Student will take one of the tracks:

Enrichment Program Track								
Track	Semester 6	Semester 7						
	IS	IN	EN	RS	CD	SA	IS	FS
1	v	v						
2	v		v					
3	v			v				
4	v				v			
5	v					v		
6	v						v	

Students in semester 6 who take minor program or free electives, in semester 7 can take the enrichment track as follows:

Enrichment Program Track							
Track	Semester 7						
	IN	EN	RS	CD	SA	IS	FS
1	v						
2		v					

3			v				
4				v			
5					v		
6						v	
7							v*

*) Regarding the implementation of the Further Study enrichment track as illustrated on the table above, if students wish to choose the Further Study track in semester 7, then their choice in semester 6 must be the Minor Program or Free Electives

Note:
IN : Certified Internship
EN : Certified Entrepreneurship
RS : Certified Research
CD : Certified Community Development
SA : Certified Study Abroad
FS : Further Study
IS : Certified Specific Independent Study

Certified Internship Track
Enrichment Program II

For students who take Certified Internship track in semester 7, they should take these courses:

Course		SCU
ISYE6221037	Working Experience in Industrial Engineering	6
ISYE6222037	Industrial Engineering in Practice	4
ISYE6224037	Industrial Experience in Industrial Engineering	6
ISYE6223037	Employability and Entrepreneurial Skills in Industrial Engineering Industry	4
Total SCU		**20**

Certified Entrepreneurship Track
Enrichment Program II

Course		SCU
ENPR6041037	Business Start Up in Industrial Engineering	6
ENPR6042037	Business Model & Validation in Industrial Engineering	4
ENPR6043037	Launching New Venture in Industrial Engineering	6
ENPR6044037	Entrepreneurship and Managing New Business in Industrial Engineering	4
	Total SCU	**20**

Certified Research Track

Enrichment Program II

Course		SCU
RSCH6683037	Industrial Engineering Research Experience	6
RSCH6684037	Scientific Writing in Industrial Engineering Research	4
RSCH6685037	Academic Writing for Industrial Engineering Research	6
RSCH6686037	Global Employability and Entrepreneurial Skills in Industrial Engineering Research	4
	Total SCU	**20**

Certified Community Development Track
Enrichment Program II

Course		SCU
CMDV6450037	Community Development Project Implementation in Industrial Engineering	6
CMDV6451037	Community Development Project Design in Industrial Engineering	4
CMDV6452037	Industrial Engineering Program Execution for Community	6
CMDV6453037	Employability and Entrepreneurial Skills in Industrial Engineering Community	4
	Total SCU	**20**

Certified Study Abroad Track
Enrichment Program II

Course		SCU
Elective courses list for study abroad*		
GLOB6415037	Elective Course for Study Abroad 1	4
GLOB6416037	Elective Course for Study Abroad 2	4
GLOB6417037	Elective Course for Study Abroad 3	3
GLOB6418037	Elective Course for Study Abroad 4	3
GLOB6419037	Elective Course for Study Abroad 5	3
GLOB6420037	Elective Course for Study Abroad 6	2
GLOB6421037	Elective Course for Study Abroad 7	2
GLOB6422037	Elective Course for Study Abroad 8	2
GLOB6423037	Elective Course for Study Abroad 9	1
GLOB6424037	Elective Course for Study Abroad 10	1
GLOB6425037	Elective Course for Study Abroad 11	4
GLOB6426037	Elective Course for Study Abroad 12	4
GLOB6427037	Elective Course for Study Abroad 13	3
GLOB6428037	Elective Course for Study Abroad 14	3
GLOB6429037	Elective Course for Study Abroad 15	3
GLOB6430037	Elective Course for Study Abroad 16	2

GLOB6431037	Elective Course for Study Abroad 17	2
GLOB6432037	Elective Course for Study Abroad 18	2
GLOB6433037	Elective Course for Study Abroad 19	1
GLOB6434037	Elective Course for Study Abroad 20	1
	Total SCU	**20**

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

Certified Specific Independent Study Track
Enrichment Program I

For students who take Specific Independent Study track in the 6th semester, they should take these courses:

Course		**SCU**
CSIS6037037	Course Certification	3
CSIS6038037	Technical Skill Enrichment	4
CSIS6039037	Industrial Project	9
CSIS6040037	Soft Skill Enrichment	4
CSIS6041037	Elective Course for Specific Independent Study 1	4
CSIS6042037	Elective Course for Specific Independent Study 2	4
CSIS6043037	Elective Course for Specific Independent Study 3	3
CSIS6044037	Elective Course for Specific Independent Study 4	3
CSIS6045037	Elective Course for Specific Independent Study 5	3
CSIS6046037	Elective Course for Specific Independent Study 6	2
CSIS6047037	Elective Course for Specific Independent Study 7	2
CSIS6048037	Elective Course for Specific Independent Study 8	2
CSIS6049037	Elective Course for Specific Independent Study 9	1
CSIS6050037	Elective Course for Specific Independent Study 10	1
CSIS6051037	Elective Course for Specific Independent Study 11	4
CSIS6052037	Elective Course for Specific Independent Study 12	4
CSIS6053037	Elective Course for Specific Independent Study 13	3
CSIS6054037	Elective Course for Specific Independent Study 14	3
CSIS6055037	Elective Course for Specific Independent Study 15	3
CSIS6056037	Elective Course for Specific Independent Study 16	2
CSIS6057037	Elective Course for Specific Independent Study 17	2
CSIS6058037	Elective Course for Specific Independent Study 18	2
CSIS6059037	Elective Course for Specific Independent Study 19	1
CSIS6060037	Elective Course for Specific Independent Study 20	1
CSIS6097037	Elective Course for Specific Independent Study 21	6
CSIS6098037	Elective Course for Specific Independent Study 22	6
CSIS6099037	Elective Course for Specific Independent Study 23	6
	Total SCU	**20**

Enrichment Program II

For students who take Specific Independent Study track in the 7th semester, they should take these courses:

Course		SCU
CSIS6037037	Course Certification	3
CSIS6038037	Technical Skill Enrichment	4
CSIS6039037	Industrial Project	9
CSIS6040037	Soft Skill Enrichment	4
CSIS6100037	Elective Course for Specific Independent Study 24	4
CSIS6101037	Elective Course for Specific Independent Study 25	4
CSIS6102037	Elective Course for Specific Independent Study 26	3
CSIS6103037	Elective Course for Specific Independent Study 27	3
CSIS6104037	Elective Course for Specific Independent Study 28	3
CSIS6105037	Elective Course for Specific Independent Study 29	2
CSIS6106037	Elective Course for Specific Independent Study 30	2
CSIS6107037	Elective Course for Specific Independent Study 31	2
CSIS6108037	Elective Course for Specific Independent Study 32	1
CSIS6109037	Elective Course for Specific Independent Study 33	1
CSIS6110037	Elective Course for Specific Independent Study 34	4
CSIS6111037	Elective Course for Specific Independent Study 35	4
CSIS6112037	Elective Course for Specific Independent Study 36	3
CSIS6113037	Elective Course for Specific Independent Study 37	3
CSIS6114037	Elective Course for Specific Independent Study 38	3
CSIS6115037	Elective Course for Specific Independent Study 39	2
CSIS6116037	Elective Course for Specific Independent Study 40	2
CSIS6117037	Elective Course for Specific Independent Study 41	2
CSIS6118037	Elective Course for Specific Independent Study 42	1
CSIS6119037	Elective Course for Specific Independent Study 43	1
CSIS6120037	Elective Course for Specific Independent Study 44	6
CSIS6121037	Elective Course for Specific Independent Study 45	6
CSIS6122037	Elective Course for Specific Independent Study 46	6
	Total SCU	**20**

Futher Study Track
Enrichment Program II

Course		SCU
ISYE6296037	Supply Chain and Operational Excellence	6
ISYE6297037	System Simulation and Modeling	4
ISYE6298037	Industrial Design	6
ISYE6315037	Certification in Industrial Engineering	4
	Total SCU	**20**

Students should pass all of these quality-controlled courses as listed below:

No.	Course Code	Course	SCU	Minimal Grade	Semester	Period
1	CHAR6019037	Character Building: Pancasila	2	B	2	1
2	ENTR6081037	Entrepreneurship	4	C	2	2
3	ISYE6189037	Deterministic Optimization & Stochastic Processes	6	C	3	2
4	ISYE6188037	Human-Integrated Systems	3/1	C	3	1
5	ISYE6094037	Quality Engineering	4	C	4	1
6	ISYE6096037	Production & Operation Analysis	4/2	C	5	1
Stream: Supply Chain Engineering						
7	ISYE6090037	Supply Chain: Logistics	4	C	5	2
8	ISYE6236037	E-Supply Chain Management	3/1	C	5	2
Stream: Manufacturing System Engineering						
7	ISYE6077037	Project Management	4	C	5	2
8	ISYE6237037	Sustainable Manufacturing Systems	3/1	C	5	2