

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 increase 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 on 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 areas of concentration. The three tracks are: Supply Chain Management, Logistics, Service Systems Engineering, and Manufacturing Systems.

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 Laboratory, Technical Drawing Lab, Simulation Lab, Work Design and Ergonomics Lab.

Vision

The most prestigious and dynamic Industrial Engineering school in Indonesia by producing globally accepted graduates.

Mission

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

1. Providing a solid educational experience through the diffusion and integration of knowledge of Industrial Engineering, and services to industries.
2. Educating students from a diverse background in the fundamental skills, knowledge and practice of Industrial Engineering in order to prepare them for a position in global industries and continue for advanced degrees in Industrial Engineering or related disciplines.
3. Providing research and professional services to streamline and optimize operations which contribute to the enhancement of the quality of life.
4. Acknowledging all talents that positively contribute to the quality of life of Indonesians and the international community.

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.

Graduate Competency

At the end of the program, graduates will have these following competencies :

1. An ability to apply mathematics, science, and engineering.
2. An ability to design and conduct experiments, as well as to analyze and interpret data.
3. An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
4. An ability to identify, formulate, and solve industrial engineering problems.
5. An ability to function on multidisciplinary teams.
6. An understanding of professional and ethical responsibility.
7. An ability to communicate effectively.
8. The broad education necessary to understand impact of industrial engineering solutions in a global, economic, environmental, and societal context.
9. A recognition of the need for, and an ability to engage in life-long learning.
10. A knowledge of contemporary issues.
11. An ability to use the techniques, skills, and modern engineering tools necessary for industrial engineering practice.

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	CHAR6013	Character Building: Pancasila	2	20	
	ISYE6001	Introduction to Industrial System	2		
	SCIE6004	Physics I	4		
	ECON6018	Managerial Economics	2		
	MATH6014	Calculus I	4		
	SCIE6007	Industrial Chemistry	4		
	English University Courses I				
	ENGL6128	English in Focus	2		
	ENGL6130	English for Business Presentation	2		
2	CHAR6014	Character Building: Kewarganegaraan	2	20	
	SCIE6005	Physics II	4/2		
	ENGR6004	Technical Drawing	2/2		
	MATH6016	Calculus II	4		
	CIVL6030	Environmental Engineering	2		
	English University Courses II				
	ENGL6129	English Savvy	2		
	ENGL6131	English for Written Business Communication	2		
3	STAT6003	Probability Theory	2	22	
	MATH6004	Linear and Discrete Mathematics	4		
	SCIE6017	Biology	2		
	MATH6019	Calculus III	4		
	COMP6047	Algorithm and Programming	4/2		
	CHAR6015	Character Building: Agama	2		
	STAT6002	Research Methodology	2		
4	STAT6006	Applied Statistics	4	22	
	ISYE6059	Human-Integrated Systems	2/2		
	ISYE6039	Deterministic Optimization	4		
	ENTR6003	Entrepreneurship I	2		
	ISYS6123	Introduction to Database Systems	2/2		
	Elective Courses**				
	CPEN6080	Electronic Devices	4/1		
	CPEN6079	Electric Circuit Theory	2/1		
	CPEN6028	Actuators and Sensors	2		
	CIVL6021	Statics	4/1		
	CPEN6099	Signal and System	4		
	COMP6014	Introduction to Data Structure	2		
	CIVL6023	Fluid Mechanics and Hydraulics	4/1		
CIVL6022	Soil Mechanics	4/1			
CIVL6025	Hydrology	2			
5	STAT6096	Stochastic Processes	4	22	
	LANG6034	Business Ethics and Communication*	2		
	ISYE6060	Leadership and Organization Behavior	4		
	ISYE6101	Production & Operation Analysis	4/2		
	ISYE6102	Quality Engineering	4		

Sem	Code	Course Name	SCU	Total		
	Stream: Manufacturing System					
	ENGR6005	Mechanics of Materials	2			
	Stream: Service System Engineering					
	ISYE6066	Human Interaction in Service Systems	2			
	Stream: Supply Chain Management					
6	ISYE6006	System Modeling and Simulation	4	20		
	ISYE6041	Engineering Economy	2			
	ENTR6004	Entrepreneurship II	2			
	ACCT6140	Financial Accounting	4			
	Stream : Manufacturing System					
	ISYE6070	Facility Planning	2			
	ISYE6061	Manufacturing Process	4/2			
	Stream : Service System Engineering					
	ISYE6062	Financial Engineering	4			
	ISYE6047	Decision Support System	4			
	Stream: Supply Chain Management					
	ISYE6048	Supply Chain : Logistics	4			
	ISYE6055	E-Supply Chain Management	2/2			
	7	ISYE6063	Industrial Practice		4	12
		Stream: Manufacturing System				
ISYE6072		Project Management*	4			
ISYE6064		Sustainable Engineering Systems	4			
Stream: Service System Engineering						
ISYE6072		Project Management*	4			
ISYE6065		Dynamic Service Facility Design	2/2			
Stream: Supply Chain Management						
CIVL6071		Transportation System Modeling	4			
ISYE6073	Supply Chain Risk and Negotiation*	4				
8	ISYE6024	Final Project	6	8		
	ISYE6103	Special Topics	2			
TOTAL CREDIT 146 SCU						

*) *Entrepreneurship Embedded*

**) *Elective Courses: Student has to choose 4 Credits (on 4th semester)*

English University Courses:

-) *For 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 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*

The Table of Prerequisite for Industrial Engineering (S1)

Subject		Credits	Prerequisites		Credits
MATH6019	Calculus III	4	MATH6014	Calculus I	4
STAT6096	Stochastic Processes	4	STAT6003	Probability Theory	2
ISYE6101	Production & Operation Analysis	4/2	ISYE6039	Deterministic Optimization	4
ISYE6102	Quality Engineering	4	STAT6006	Applied Statistics	4
Stream : Supply Chain Management					
ISYE6048	Supply Chain : Logistics	4	ISYE6039	Deterministic Optimization	4
Stream : Service System Engineering					
ISYE6062	Financial Engineering	4	ISYE6039	Deterministic Optimization	4
ISYE6065	Dynamic Service Facility Design	2/2	STAT6096	Stochastic Processes	4

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

No.	Code	Course Name	Minimum Grade
1	CHAR6013	Character Building: Pancasila	B
2	ENTR6004	Entrepreneurship II	C
3	ISYE6039	Deterministic Optimization*	C
4	ISYE6059	Human-Integrated Systems	C
5	ISYE6102	Quality Engineering*	C
6	ISYE6101	Production & Operation Analysis	C
Stream: Manufacturing System			
7	ISYE6061	Manufacturing Process	C
8	ISYE6070	Facility Planning*	C
Stream: Service System Engineering			
7	ISYE6066	Human Interaction in Service Systems*	C
8	ISYE6065	Dynamic Service Facility Design	C
Stream: Supply Chain Management			
7	ISYE6048	Supply Chain : Logistics*	C
8	CIVL6071	Transportation System Modeling	C

*) Tutorial & Multipaper