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 competitive 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. Recognize problem context and apply appropriate engineering design methods and tools to represent, integrate, and solve problems to work productively within their professions.
2. Possess effective communication and leadership strategy and commit to the highest standard of profession and ethical practice
3. Understand the integrated and broad nature of the Industrial Engineering with appreciation of the depth of the field and able to find and utilize the up-to-date information and tools as needed

Graduate Competency

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

1. An ability to apply mathematics, science, and engineering to the Industrial Engineering domain
2. An ability to collect, analyze, and interpret the data used in designing and conducting experiments
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 problems through Industrial Engineering approaches
5. An ability to function in multi-disciplinary teams
6. An understanding of professional and ethical responsibilities
7. An ability to communicate effectively
8. The broad education necessary to determine impact of Industrial Engineering in a global, economic, environmental, and societal context
9. A recognition of the need 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	CB412	CB: Self Development	2	20
	D0052	Introduction to Industrial System	2	
	D0684	Physics I	4	
	D0992	Managerial Economics	2	
	K0024	Calculus I	4	
	K0134	Industrial Chemistry	4	
	G1372	English Entrant	2	
2	CB422	CB: Spiritual Development	2	20
	D0696	Physics II	4/2	
	D1044	Technical Drawing	2/2	
	K0044	Calculus II	4	
	D0702	Environmental Science	2	
	G1382	English in Focus	2	
3	D0712	Probability Theory	2	22
	D1054	Linear and Discrete Mathematics	4	
	D1062	Biology	2	
	K0074	Calculus III	4	
	G1392	English Savvy	2	
	T0016	Algorithm and Programming	4/2	
	D0222	Research Methodology	2	
4	CB432	CB: Interpersonal Development	2	20
	D1074	Applied Statistics	4	
	D1084	Human-Integrated Systems	2/2	
	D0744	Deterministic Optimization	4	
	EN001	Entrepreneurship I	2	
	M0564	Introduction to Database Systems	2/2	

Sem	Code	Course Name	SCU	Total
5	CB442	CB: Professional Development	2	20/22/22
	D0734	Stochastics Process	4	
	D1252	Business Ethics and Communication*	2	
	D1114	Financial Accounting	4	
	Stream : Manufacturing System			
	D1212	Mechanics of Materials	2	
	D1226	Production Planning and Inventory Control	4/2	
	Stream : Service System Engineering			
	D1182	Human Interaction in Service Systems	2	
	D0814	Operation of Service System	4	
	D0314	Quality Management System Design	4	
	Stream : Supply Chain Management			
	D1192	Global Supply Chain	2	
	D0314	Quality Management System Design	4	
	D0954	E-Supply Chain Management	2/2	
6	D0174	System Modeling and Simulation	4	22/20/20
	D0762	Engineering Economy	2	
	EN002	Entrepreneurship II	2	
	D1104	Leadership and Organization Behavior	4	
	Stream : Manufacturing System			
	D1232	Facility Planning	2	
	D0782	Quality Control	2	
	D1126	Manufacturing Process	4/2	
	Stream : Service System Engineering			
	D1134	Financial Engineering	4	
	D0834	Decision Support System	4	
	Stream : Supply Chain Management			
	D0844	Supply Chain : Logistics	4	
	D0854	Supply Chain : Manufacturing and Warehousing	4	
7	D1144	Industrial Practice	4	12
	Stream : Manufacturing System			
	D1264	Project Management*	4	
	D1164	Sustainable Engineering Systems	4	
	Stream : Service System Engineering			
	D1264	Project Management*	4	
	D1174	Dynamic Service Facility Design	2/2	
	Stream : Supply Chain Management			
	D0874	Transportation System Modeling	4	
	D1274	Supply Chain Risk and Negotiation*	4	

Sem	Code	Course Name	SCU	Total
8	D0386	Final Project	6	10
	Stream : Manufacturing System			
	D0414	Advanced Topics in Production and Manufacturing System	4	
	Stream : Service System Engineering			
	D0974	Advanced Topics in Service System Engineering	4	
	Stream : Supply Chain Management			
	D0984	Advanced Topics in Supply Chain Management	4	
	Elective Courses			
	G1402	English for Business Presentation	2	
	G1412	English for Written Business Communication	2	
TOTAL CREDIT 146				

*) Entrepreneurship Embedded

The Table of Prerequisite for Industrial Engineering (S1)

Subject		Credits	Prerequisites		Credits
K0074	Calculus III	4	K0024	Calculus I	4
D0734	Stochastics Process	4	D0712	Probability Theory	2
D0174	System Modeling and Simulation	4	D0734	Stochastics Process	4
Stream					
Supply Chain Management					
D0844	Supply Chain : Logistics	4	D0744	Deterministic Optimization	4
D0854	Supply Chain : Manufacturing and Warehousing	4			
Manufacturing System					
D0782	Quality Control	2	D1074	Applied Statistics	4
Service System Engineering					
D1134	Financial Engineering	4	D0744	Deterministic Optimization	4
D1174	Dynamic Service Facility Design	2/2	D0734	Stochastics Process	4

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

No	Code	Course Name	Minimum Grade
1	CB412	CB : Self Development	B
2	EN002	Entrepreneurship II	C
3	D0734	Stochastics Process*	C
4	D0744	Deterministic Optimization*	C
5	D1074	Applied Statistics*	C
6	D1084	Human-Integrated Systems	C
Stream			
Manufacturing System			
7	D1226	Production Planning and Inventory Control	C
8	D1126	Manufacturing Process	C
Service System Engineering			
7	D0814	Operation of Service Systems*	C
8	D1174	Dynamic Service Facility Design	C
Supply Chain Management			
7	D0854	Supply Chain : Manufacturing and Warehousing*	C
8	D0844	Supply Chain : Logistics*	C

*) Tutorial & Multipaper