جامعة الطائف
TAIF UNIVERSITY

كلية الهندسة
College of Engineering
١٤٢٤ هـ - ٢٠٠٣ م

Industrial Engineering
PROGRAM HANDBOOK

Taif University
1- January- 2024

Contents

Introduction

Dear Student

Welcome to the Industrial Engineering Department!

The purpose of this handbook is to provide Industrial Engineering students at Engineering College, Taif university a quick and complete source of information and guidelines to curriculum, requirements, procedures and academic policies.

The Industrial Engineer is a broadly trained integration engineer, concerned with enabling complex systems function effectively. Managing the inventory of a production facility, for example, involves issues of production and stocking policy, manufacturing equipment, human resources, customer demand, and supplier relationships. The industrial engineer must understand the interaction of the components of a system and coordinate the flow of materials and information to effectively manage the operation. The industrial engineer plays an important role in defining information needs and developing strategies for decision making based on incomplete knowledge. However, the skills of the industrial engineer have much greater application than to traditional production environments. In a growing service sector of the economy including health care delivery, public safety, air transportation, and banking, for example, issues of resource management, scheduling, quality of service, and systems design are important.

In this handbook, you will find information about the curriculum, course requirements, and academic policies of the IEP.

We encourage you to use this handbook as a guide throughout your time as an Industrial Engineering student. If you have any questions or concerns, please do not hesitate to reach out to your academic advisor or any member of the Industrial Engineering Program. We are here to support you and help you achieve your academic and professional goals in this exciting field.

Mission:

The Industrial Engineering Program at Taif University aims to provide a high-quality education to undergraduate students in the field of Industrial engineering. Our mission is to graduate industrial engineers equipped with practical and comprehensive knowledge of all IE methods, contributing in world class research to enhance the national living standard by innovative solutions.

We strive to achieve our mission by offering a rigorous and innovative curriculum that includes a strong foundation in mathematics, science, and engineering principles. We also emphasize hands-on experience through laboratory projects, design projects, and research opportunities. Our faculty members are committed to excellence in teaching, research, and service, and provide a supportive and inclusive learning environment for all students.

Program Goals:

The IEP at Taif university is designed to prepare graduates with the knowledge, skills, and attitudes needed to excel as industrial engineers. The Program Goals (PGs) of the Industrial Engineering Program at Taif University:

PG 1: Perform and practice planning and engineering design that are based on sound industrial engineering principles and that consider functionality, safety, economic viability and sustainability.

PG 2: Advance in professional practice, ethical awareness and societal implications.

PG 3: Enhance their skills through enrolling in graduate studies, attending workshops or becoming a member in one of the professional societies.

IEP at Taif university aims to produce graduates who possess problem-solving skills, are ready for a range of careers, exhibit intellectual depth and creativity, and uphold ethical and socially responsible values. These objectives are achieved through a comprehensive and innovative curriculum, hands-on experience, and support for personal and professional growth.

Program Learning Outcomes:

The IEP at Taif university is designed to provide students with a comprehensive education that prepares them for success as Industrial engineers. The program has identified the following learning outcomes for students:

Knowledge:

K1: An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Skills:

S1: An ability to formulate and solve complex engineering problems by applying principles of engineering, science, and mathematics.

S2: An ability 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.

S3: An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

S4: An ability to communicate effectively with a range of audiences.

Values:

V1: An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

V2: An ability 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

These learning outcomes are achieved through a curriculum that emphasizes hands-on experience, teamwork, and problem-solving skills. The program also provides opportunities for entrepreneurship and engagement with industry and society. Faculty members are committed to excellence in teaching, research, and service, and are dedicated to providing a supportive and inclusive learning environment for all students.

Assessment of student learning outcomes is an integral part of the IEP, and the program regularly evaluates student performance to ensure that the learning outcomes are being achieved. This assessment process is used to improve the program and to ensure that graduates are prepared for success as Industrial engineers.

Undergraduate program

The undergraduate program in industrial engineering takes five years to complete and provides a foundation in mathematics, physics, and engineering principles, along with specialized courses in industrial engineering topics such as Operation Research, Quality Control, Supply chain, Production Planning and control, work study, Industrial systems simulation...

To obtain the B.Sc. degree in Industrial engineering, the student must successfully complete 154 credit hours which are split over 10 levels of studying. In addition, the students are required to complete one practical summer training sessions (8 - weeks) in the industrial field.

Towards the total of 154 credit hours, 22 credit hours represent the university requirements and 46 credit hours represent the college requirements whereas 86 credit hours represent the program requirements. The tables below shows overall summary of requirements to obtain degree.

Program Structure	Required/ Elective	No. of courses	Credit Hours	Percentage
Institution Requirements	Required	**9**	**18**	**11.68%**
	Elective	**2**	**4**	**2.59 %**
College Requirements	Required	**16**	**46**	**29.88%**
	Elective	**0**	**0**	**0 %**
Program Requirements	Required	**23**	**67**	**43.50%**
	Elective	**4**	**12**	**7.8%**
Capstone Course/Project		**2**	**5**	**3.25%**
Field Experience/ Internship		**1**	**2**	**1.30%**
Total		**57**	**154**	**100**

Degree Requirement

University requirements for Industrial Engineering Program through the curriculum

Course No.	Course title	Credit Units	Contact Hours		Prerequisite	
			Lec.	Lb/T	Course No.	Course title
999805-2	Intensive English Language (1)	2	-	2	-----	-----
2004111-2	Fundamentals of Islamic Culture	2	2	-	-----	-----
105115-2	History of the Kingdom	2	2	-	-----	-----
990311-2	University Study Skills	2	2	-	-----	-----
990211-2	Arabic Language Skills	2	2	-	-----	-----
999806-2	Intensive English Language (2)	2	-	12	999805-2	Intensive English Language (1)
2004112-2	Islamic Culture (Morals and Values)	2	2	-		
	Elective Course (1)	2	2	-	-----	-----
	Elective Course (2)	2				
2004313-2	lslamic Culture (The social sys)	2	2	-		
2004414-2	lslamic Culture (Human Rights)	2	2	-		
Total		22				

College requirements for Industrial Engineering Program through the curriculum

Course No.	Course title	Credit Units	Contact Hours		Prerequisite	
			Lec.	Lb/T	Course No.	Course title
202110-3	Mathematics1	3	3	-	-----	-----
999816-2	English language for Engineering Purposes	2	-	2	999806-2	Intensive English Language (2)
8021101-2	Engineering Drawing	2	4	-	-----	-----
802201-3	Introduction to Computer Programming	3	2	3	-----	-----
203205-4	Physics	4	3	3	202110-3	Mathematics 1
202120-3	Mathematics 2	3	3	-	202110-3	Mathematics 1
204102-3	General Chemistry	3	2	2	-----	-----
2022101-3	Multi Variable Calculus	3	4	-	202120-3	Mathematics 2
2023104-2	Linear Algebra	2	3	-	202120-3	Mathematics 2
8012101-2	Fundamental of Engineering Economy	2	2	-	-----	-----
8022101-3	Introduction to Engineering Design 1	3	4	-	999806-2	Intensive English Language (2)

2022102-4	Mathematical Methods	4	5	-	2022101-3	Multi Variable Calculus
2023103-4	Differential Equations	4	4	-	2022101-3	Multi Variable Calculus
2023206-3	Numerical Analysis	3	4	-	2023103-4	Differential Equations
20284177-2	Discrete Mathematics	2	2	-	2022102-4	Mathematical Methods
8032101-3	Basics of Electrical Circuits	3	3	2	203205-4	Physics
Total		46				

Industrial Engineering Program required core courses *(86 Credit. Units)*

Course No.	Course Title	Credit Units	Contact Hours		Prerequisite	
			Lec.	Lb/T	Course No.	Course title
8052101-3	Engineering Statistics	3	4	-	202120-3	Mathematics 2
8022201-2	Production Technology	2	2	3	-----	-----
802311-3	Material science	3	2	4	204102-3	General Chemistry
8052201-3	Engineering Management	3	3	-	8052101-3	Engineering Statistics
8052202-3	Quality Control	3	3	2	8052101-3	Engineering Statistics
8052203-2	Advance Engineering Economy	2	2	-	8012101-2	Fundamental of Engineering Economy
8053102-3	Computer Applications in Industrial Engineering (1)	3	3	2	802201-3	Introduction to Computer Programming
8053103-3	Operations Research (1)	3	3	2	8052201-3 2022101-3	Engineering Management Multi Variable Calculus
8053204-3	Industrial Management	3	3	-	8052201-3	Engineering Management
8053203-3	Operations Research (2)	3	3	2	8053103-3	Operations Research (1)
8054106-3	Work Study	3	3	2	8052101-3	Engineering Statistics
8054105-3	Industrial Systems Simulation	3	3	2	8052101-3 8053102-3	ComputerApplications in Industrial Engineering (1) Engineering Statistics
8054211-3	Human Factors Engineering	3	3	2	8054106-3	Work Study
8054107-3	Production Planning and control	3	3	2	8053204-3	Industrial Management
8054108-3	Scheduling and Project Engineering	3	3	2	8052201-3 8053203-3	Operations Research (2) Engineering Statistics
8054209-3	Design of Industrial Experiments	3	3	2	8052101-3	Engineering Statistics

8053202-3	**Computer Applications in Industrial Engineering (2)**	**3**	**3**	**2**	**8053102-3**	**Computer Applications in Industrial Engineering (1)**
8054213-3	**Industrial Safety Engineering**	**3**	**3**	**2**	**8054211-3**	**Human Factors Engineering**
8054212-3	**Facilities Planning**	**3**	**3**	**2**	**8053203-3 8054211-3**	**Operations Research (2) Human Factors Engineering**
8054214-3	**Supply Chain Management**	**3**	**3**	**-**	**8053203-3 8054107-3**	**Operations Research (2) Production Planning and control**
8054210-2	**Practical Summer Training**	**2**	**2**	**-**		**Department approval**
8055114-3	**Industrial Information Systems**	**3**	**3**	**1**	**8053202-3 8054107-3**	**Production Technology/ Computer Applications in Industrial Engineering (2)**
8055115-2	**Senior Project (1)**	**2**	**2**	**2**		**Department approval**
8055116-3	**Decision Analysis**	**3**	**3**	**1**	**2022102-4 20284177-2 8052101-3**	**Mathematical Methods Discrete Mathematics Engineering Statistics**
	Elective Course 1	**3**	**3**	**1**		**Department approval**
	Elective Course 2	**3**	**3**	**1**		**Department approval**
8055217-3	**Senior Project (2)**	**3**	**3**	**3**	**8055115-2**	**Senior Project 1**
8055218-3	**Quality Improvement**	**3**	**3**	**2**	**8053202-3 8053204-3**	**Computer Applications in Industrial Engineering (2) Industrial Management**
	Elective Course 3	**3**				
	Elective Course 4	**3**				**Department approval**
Total		**86**				

The Industrial Engineering Program curriculum includes Four elective courses covering various specific fields of Industrial Engineering, and providing students with the opportunity to specialize in areas of their choosing. The following table shows the list of the elective courses available for choice by Industrial Engineering students

Industrial Engineering Elective Courses

Course No.	Course title	Credit Units	Contact Hours		Prerequisite	
			Lec.	Lb/T	Course No.	Course title
8055303-3	Reliability Engineering	3	3	1	8052101-3	Engineering Statistics
8055307-3	Industrial Quality Control	3	3	2	----------	----------
8055304-3	Special Topics in Industrial Engineering (1)	3	3	1	Project Course	----------
8055305-3	Dynamic Forecasting	3	3	1	8052101-3/ 8052201-3	Engineering Statistics Engineering Management
8055306-3	Computer Aided Manufacturing Systems	3	3	1	8053202-3	Computer Applications in Industrial Engineering (2)
8055308-3	Industrial Health Engineering	3	3	2	8053202-3/ 8054211-3	Computer Applications in Industrial Engineering (2) Human Factors Engineering
8055309-3	Industrial Environmental Engineering	3	3	1	8054211-3	Human Factors Engineering
8055310-3	Occupational Biomechanics	3	3	1	8054211-3	Human Factors Engineering
8055311-3	Industrial Stochastic Systems	3	3	1	8052101-3	Engineering Statistics
8055312-3	Queuing Systems	3	3	1	8052101-3	Engineering Statistics
8055313-3	Special Topics in Industrial Engineering (2)	3	3	1	Project Course	---------
8055314-3	Maintenance and Replacement Policies	3	3	1	8052101-3	Engineering Statistics

Study Plan

First level (Industrial Engineering Students*)*

Course No.	Course title	Credit Units	Contact Hours		Prerequisite	
			Lec.	Lb/T	Course No.	Course title
999805-2	Intensive English Language (1)	2	-	2	-----	-----
2004112-2	Islamic Culture (Morals and Values)	2	2	-	-----	-----
105115-2	History of the Kingdom	2	2	-	-----	-----
2028110-3	Mathematics1	3	3	-	-----	-----
8021201-2	Engineering Drawing	2	4	-	-----	-----
204102-3	General Chemistry	3	2	2	-----	-----
Total		14				

Second level (Industrial Engineering Students)

Course No.	Course title	Credit Units	Contact Hours		Prerequisite	
			Lec.	Lb/T	Course No.	Course title
990311-2	University Study Skills	2	2	-	-----	-----
990211-2	Arabic Language Skills	2	2	-	-----	-----
999806-2	Intensive English Language (2)	2	-	12	999805-2	Intensive English Language (1)
203205-4	Physics	4	3	3	2028110-3	Mathematics1
2028120-3	Mathematics 2	3	3	-	2028110-3	Mathematics1
802201-3	Introduction to Computer Programming	3	2	3	-----	-----
Total		16				

Third level (Industrial Engineering Students)

Course No.	Course title	Credit Units	Contact Hours		Prerequisite	
			Lec.	Lb/T	Course No.	Course title
999816-2	English for Engineering Purposes 1	2	-	2	999806-2	Intensive English Language (2)
2022101-3	Multi Variable Calculus	3	4	-	2028120-3	Mathematics 2
2023104-2	Linear Algebra	2	3	-	2028120-3	Mathematics 2
8022101-3	Introduction to Engineering Design 1	3	4	-	999806-2	Intensive English Language (2)
8052101-3	Engineering Statistics	3	4	0	2028120-3	Mathematics 2
8012101-2	Fundamental of Engineering Economy	2	2	-	-----	-----
		15				

Fourth level (Industrial Engineering Students)

Course No.	Course title	Credit Units	Contact Hours		Prerequisite	
			Lec.	Lb/T	Course No.	Course title
2004111-2	Fundamentals of Islamic Culture	2	2	-		
2022102-4	Mathematical Methods	4	5	-	2022101-3	Multi Variable Calculus
8022201-2	Production Technology	2	2	3	-----	-----
8052201-3	Engineering Management	3	3	-	8052101-3	Engineering Statistics
8052202-3	Quality Control	3	3	2	8052101-3	Engineering Statistics
8052203-2	Advance Engineering Economy	2	2	-	8012101-2	Fundamental of Engineering Economy
Total		16				

Fifth level (Industrial Engineering Students)

Course No.	Course title	Credit Units	Contact Hours		Prerequisite	
			Lec.	Lb/T	Course No.	Course title
	Elective Course (1)	2	2	-	-----	-----
2028102-4	Differential Equations	4	4	-	2022101-3	Multi Variable Calculus
802311-3	Material science	3	4	-	204102-3	General Chemistry
8053102-3	Computer Applications in Industrial Engineering (1)	3	3	2	802201-3	Introduction to Computer Programming
8053103-3	Operations Research (1)	3	3	2	8052201-3 / 2022101-3	Engineering Management/ Multi Variable Calculus
Total		13				

Sixth level (Industrial Engineering Students

Course No.	Course title	Credit Units	Contact Hours		Prerequisite	
			Lec.	Lb/T	Course No.	Course title
2004313-2	lslamic Culture (The social sys)	2	2	-		
2023206-3	Numerical Analysis	3	4	-	2028102-4	Partial Differential Equations
8032101-3	Basics of Electrical Circuits	3	2	3	203205-4	Physics
8053204-3	Industrial Management	3	3	-	8052201-3	Engineering Management
8053203-3	Operations Research (2)	3	3	2	8053103-3	Operations Research (1)
8054106-3	Work Study	3	3	2	8052101-3	Engineering Statistics
	Elective Course (2)					
Total		17				

Seventh level (Industrial Engineering Students)

Course No.	Course title	Credit Units	Contact Hours		Prerequisite	
			Lec.	Lb/T	Course No.	Course title
2004414-2	lslamic Culture (Human Right)	2	2	-		
8054105-3	Industrial Systems Simulation	3	3	2	8052101-3/ 8053102-3	Engineering Statistics/ Computer Applications in Industrial Engineering (1)
20284177-2	Discrete Mathematics	2	2	-	2022102-4	Mathematical Methods
8054211-3	Human Factors Engineering	3	3	3	8054106-3	Work Study
8054107-3	Production Planning and control	3	3	4	8053204-3	Industrial Management
8054108-3	Scheduling and Project Engineering	3	3	2	8052201-3 8053203-3	Operations Research (2) Engineering Management

Total	16			

Eighth level *(Industrial* Engineering Students)

Course No.	Course title	Credit Units	Contact Hours		Prerequisite	
			Lec.	Lb/T	Course No.	Course title
8054209-3	Design of Industrial Experiments	3	3	2	8052101-3	Engineering Statistics
8054214-3	Supply Chain Management	3	3	-	8053203-3 8054107-3	Operations Research (2) Production Planning and control
8053202-3	Computer Applications in Industrial Engineering (2)	3	3	2	8053102-3	Computer Applications in Industrial Engineering (1)
8054213-3	Industrial Safety Engineering	3	3	2	8054211-3	Human Factors Engineering
8054212-3	Facilities Planning	3	3	2	/ 8053203-3 8054211-3	Operations Research (2) Human Factors Engineering
Total		15				

Summer Session *(Industrial* Engineering Students)

Course No.	Course title	Credit Units	Actual hours	Prerequisite
8054301-2	Practical summer training	2	2	Department approval

Ninth level (Industrial Engineering Students)

Course No.	Course title	Credit Units	Contact Hours		Prerequisite	
			Lec.	Lb/T	Course No.	Course title
8055114-3	Industrial Information Systems	3	3	1	8053202-3 8054107-3	Production Technology/ Computer Applications in Industrial Engineering (2)
8055115-2	Senior Project 1	2	2	2		Department approval
8055116-3	Decision Analysis	2	2	2	2022102-4 20284177-2 8052101-3	Mathematical Methods Discrete Mathematics Engineering Statistics
	Elective Course 1	3				Department approval
	Elective Course 2	3				Department approval
Total		14				

Tenth level *(Industrial* Engineering Students)

Course No.	Course title	Credit Units	Contact Hours		Prerequisite	
			Lec.	Lb/T	Course No.	Course title
8055217-3	Senior Project 2	3	3	3	8055115-2	Senior Project 1
8055218-3	Quality Improvement	3	3	2	8053202-3 8053204-3	Computer Applications in Industrial Engineering (2)/ Industrial Management
	Elective Course 3	3				Department approval
	Elective Course 4	3				Department approval
Total		12				

Application and admission:

Admission and Application Requirements for the Program of Industrial Engineering:

General Requirements:

- The applicant must be a Saudi citizen or have a Saudi mother or father.
- The applicant must hold a high school diploma or its equivalent from inside or outside the Kingdom.
- The applicant must have successfully passed the General Aptitude Test and Academic Achievement Test from the National Center for Measurement for the Health and Science track.
- The applicant must have successfully passed the General Aptitude Test from the National Center for Measurement for the Humanities track.
- The applicant must be medically fit, and the university has the right to change the applicant's major if their health condition is not suitable for the major they were accepted into.
- The applicant must be a full-time student.
- The applicant must obtain approval from their employer to attend full-time study if they are employed in a government or private sector.
- The applicant must not have been expelled from the university or any other university due to disciplinary action.
- The applicant must successfully pass any test or interview determined by the relevant department.
- No application will be accepted for the applicant to enroll in two scientific degrees at the same time.
- The applicant must not be enrolled in another university.
- A graduate from the university cannot enroll again for the same degree.
- The applicant must meet any other requirements determined by the university.
- The applicant is responsible for the accuracy of the data, and the university has the right to cancel their acceptance if the data is inaccurate.

Admission Criteria:

- The relative weight is calculated as follows:

High school diploma:	30%
GAT	30%
SAAT	40%

Application Stages:

1. Application Submission: The applicant submits their application, and the available majors will appear according to the requirements.
2. Application Follow-up: The applicant must follow up on their application status on the admission portal according to the announced dates.
3. Provisional Acceptance: The major in which the applicant was accepted will appear based on their weighted percentage and the order of their preferences on their personal page in the admission portal.
4. Confirmation of Preferences: The applicant confirms their preference for the major in which they were accepted. Failure to confirm within the specified time frame will result in the forfeiture of their acceptance.
5. Final Acceptance: The applicant can obtain their university ID number by following up on their application on the admission portal according to the announced dates.
6. Upgrade: Acceptance is upgraded automatically, and the applicant cannot return to their previous major, so they must carefully and accurately order their preferences based on their interests and inclinations.

Admission Procedures:

1. The applicant logs into the admission portal via the following link (https://admission.tu.edu.sa).
2. The applicant enters the required information on the website and ensures the accuracy of the entered mobile number for communication purposes.
3. The applicant confirms their major preferences based on their interests and inclinations. (Note that acceptance will be upgraded automatically if there are available seats.)
4. The applicant must retain the application number that will appear after completing the data entry process.
5. The university obtains the student's data (high school, aptitude test, academic achievement test) automatically through a link with the relevant authorities.
6. All admission stages are conducted electronically, and the applicant does not need to visit the university.

INDUSTRIAL ENGENEERING PROGRAME REQUIRED CORE COURSES SYLLABUS

Course Description Engineering Statistics 8052101-3
Descriptive statistics with graphical summaries. Central tendency and Dispersion measures. Basic concepts of probability and its engineering applications. Probability and Counting Rules, Baye's Rule, Probability distributions of random variables, Some Discrete Probability Distributions: Uniform, Polynomial, Poisson etc., Some Continuous Probability Distributions: Normal, Exponential, Chi-Square distribution, t-distribution, F distribution etc.
Course Description Engineering Management 8052201-3
Role of engineers in management of organizations. Managerial functions related to production, inventory and human resources. Project planning and control. Case studies pertaining to engineering problems.
Course Description Quality Control 8052202-3
Statistical methods useful in quality control and improvement (sampling distributions, problems of point and interval estimation, hypothesis testing, etc.). Tools and Methods of Statistical Process Control (SPC), Control Charts for variables, Control Charts for attributes, process and measurement system, and capability analysis. Software MINITAB
Course Description Advance Engineering Economy 8052203-2
The module is designed to provide an introduction to financial accounting, corporate finance financial management of organizations and basic understanding of financial statements with an emphasis on the balance sheet.
Course Description Computer Applications in Industrial Engineering (1) 8053102-3
Students will be able to understand and apply various number systems and data representation schemes used on digital computers. Students will be able to design, implement, and debug computer programs using one and two dimensional arrays, data structures and databases.

Course Description Operations Research (1) 8053103-3
Introduction to Operations Research. Formulation of linear programming problems. Graphical solution. The Simplex algorithm. Duality and sensitivity analysis. Transportation and assignment problems.
Course Description Industrial Management 8053204-3
Introduction to industrial management. Economic concepts in industry. Organizational structure and design. Human resource management. Motivating the work force. Managing information technology. Financial management. Engineers in marketing and services. Job analysis, job description and job specification. Preparation of business plan.
Course Description Operations Research (2) 8053203-3
Non-linear programming. Dynamic programming. Inventory models. Game theory. Network Analyses. Applications in industrial, service and public systems.
Course Description Work Study 8054106-3
Introduction to Work Study (WS). Productivity and WS. WS approaches. Basic procedure of motion study: job selection, recording facts, critical examination, etc. String diagram, Multiple activity chart, Travel chart. Principles of motion economy. Two-handed chart. Fundamental hand motions. Micro-motion and Memo-motion studies. Cyclegraph and Chrono-cyclegraph. Work Measurement (WM). Work sampling. Time study. Computerized WM. PMTS: MTM, Work factor and Standard data. Wage payment and incentive plans.
Course Description Industrial Systems Simulation 8054105-3
Basic theory of industrial simulation. Organization of simulation studies and projects. Simulation modeling and application to industrial system design and operation management. Use of software such as ARENA for discrete event simulation, Inputs analyzer to goodness fit of distributions. Statistical Output analysis. Analysis of Variance (ANOVA) technique. Using simulation as a decision-making tool

Course Description Human Factors Engineering 8054211-3
Introduction to human factors engineering. Muscular work. Nervous control. Work efficiency. Body size and anthropometrics. Work station design. Heavy work. Handling loads. Man-machine systems. Mental activity. Fatigue. Stress and boredom. Vision and lighting. Noise and vibration.

Course Description Production Planning and control 8054107-3
Application of industrial engineering theory and practice to the area of operations management and production planning/control. Analysis and understanding of forecasting, aggregate planning, capacity planning, just-in time systems, materials requirement planning, inventory management, short-term scheduling and sequencing, line balancing and other pertinent topics.

Course Description Scheduling and Project Engineering 8054108-3
Study of the concepts used in planning and scheduling of projects. Understanding and applying the available methods of project scheduling, including sequence of different construction processes as well as formulating and diagramming schedules.

Course Description Design of Industrial Experiments 8054209-3
Principles of experimental design. Factorial Design. General factorial designs. 2^k Factorial designs. Orthogonal Array. Fractional Design. Taguchi method. Response surface methodology and robust design. Simple Linear Regression and Correlation. ANOVA analysis. Experimental optimization.

Course Description Computer Applications in Industrial Engineering (2) 8053202-3
Introduction to computer applications, databases and relational database management systems. Design and development of databases. Management of database users and security. Introduction to front-end and its connectivity with the database.

Course Description Industrial Safety Engineering 8054213-3
Accident: causes and costs. Appraising safety performance and risk assessment. Analysis of accident causes. Accident reports and records. Job safety analysis. Plant inspection. Accident investigation. Plant layout and arrangement. Plant housekeeping. Maintenance and safety. Material handling and safety. Machine guarding. Explosion and fire prevention. Personal protection. First aid. Planning for emergencies.

Course Description Facilities Planning 8054212-3

Fundamentals of facilities planning. Facilities design. Flow, space and activity relationships. Material handling systems. Layout planning models. Warehouse operations. Quantitative facilities planning models. Preparing, presenting, implementing and maintaining facilities plan.

Course Description Supply Chain Management 8054214-3

Presents modern quantitative techniques for designing, analyzing, managing, and improving supply chains using deterministic and probabilistic models. Topics include a macro view of supply chains, demand forecasting, aggregate planning, sequencing and scheduling, inventory analysis and control, materials requirement planning, pricing and revenue management, contracts decisions, transportation decisions, location and distribution decisions, supplier selection methods, and global supply chains.

Course Description Industrial Information Systems 8055114-3

General concepts. Values and attributes of information. Different types of information systems. Concepts of managerial information systems. Analysis, design and development of industrial information systems. Developing information systems by using microcomputers.

Course Description Decision Analysis 8055116-3

Principles of decision making under uncertainty. Decision models: influence diagram and decision tree. Solution and analysis of decision problems. Value of information. Attitudes towards risk. Utility theory. Multi-attribute decision problem

Course Description Quality Improvement 8055218-3

Quality systems and standards. Quality Assurance, Quality and Management and ISO 9001. Basic quality tools for process improvement. Quality methods (Failure Modes Effect Analysis (FMEA), Quality Function Deployment (QFD), Acceptance sampling, Value Analysis, Function Analysis, Advanced SPC etc.). Quality Improvement (QI): Description, Importance and teams. DMAICS methodology, Six Sigma concept