



جامعة الفيصل
Alfaisal University

Bachelor of Industrial Engineering

College of Engineering, Alfaisal University

Effective: Fall 2019

Curriculum Structure and Study Plan

The Bachelor of Industrial Engineering curriculum is composed of **142** Credit Hours (CRHs) divided as follows:

- I. General Education Requirements (50 CRHs)**
 1. Mathematics & Statistics (21 CRHs)
 2. Basic Sciences (12 CRHs)
 3. Humanities (17 CRHs)
- II. Core Requirements (92 CRHs)**
 1. Industrial Engineering Courses (45 CRHs)
 2. College of Engineering Courses (38 CRHs)
 3. Technical Electives (9 CRHs)
 4. Summer Internship (0 CRHs)

| |
|--|
| I. General Education Requirements (50 CRHs) |
|--|

1. Mathematics & Statistics (21 CRHs)

| Course Code | Course-Title | Credit Hours (CRHs) | | | | Pre-Requisite Course Code | Co-Requisite Course Code |
|----------------|---|---------------------|----------|----------|----------|---------------------------|--------------------------|
| | | Total-CRHs | Lect. | Lab | Tut | | |
| MAT 101 | Calculus I | 3 | 3 | 0 | 0 | | |
| MAT 112 | Calculus II | 3 | 3 | 0 | 0 | MAT 101 | |
| MAT 211 | Calculus III | 3 | 3 | 0 | 0 | MAT 112 | |
| MAT 212 | Linear Algebra | 3 | 3 | 0 | 0 | MAT 112 | |
| MAT 213 | Differential Equations | 3 | 3 | 0 | 0 | MAT 112 | MAT 212 |
| MAT 224 | Numerical Methods | 3 | 3 | 0 | 0 | MAT 212 | |
| STA 212 | Probability and Statistics for Engineers | 3 | 3 | 0 | 0 | MAT 112 | |

2. Basic Sciences (12 CRHs)

| Course Code | Course-Title | Credit Hours (CRHs) | | | | Pre-Requisite Course Code | Co-Requisite Course Code |
|-------------|---|---------------------|------|-----|-----|---------------------------|--------------------------|
| | | Total-CRHs | Lect | Lab | Tut | | |
| CHM 102 | Introduction to Chemistry | 3 | 3 | 0 | 1 | | |
| CHM 102 L | Introduction to Chemistry Lab | 1 | 0 | 2 | 0 | | CHEM 102 |
| PHU 103 | Mechanics and Waves for Engineers | 3 | 3 | 0 | 1 | | MAT 101 |
| PHU 103 L | Mechanics and Waves for Engineers Lab | 1 | 0 | 2 | 0 | | PHU 103 |
| PHU 124 | Electromagnetism and Optics for Engineers | 3 | 3 | 0 | 1 | PHU 103, MAT 101 | |
| PHU 124 L | Electromagnetism and Optics for Engineers Lab | 1 | 0 | 2 | 0 | PHU 103, MAT 101 | PHU 124 |

3. Humanities (17 CRHs)

| Course Code | Course-Title | Credit Hours (CRHs) | | | | Pre-Requisite Course Code | Co-Requisite Course Code |
|-------------|-----------------------------------|---------------------|------|-----|-----|---------------------------|--------------------------|
| | | Total-CRHs | Lect | Lab | Tut | | |
| ENG 101 | Freshman English I | 3 | 3 | 0 | 0 | | |
| ENG 112 | Freshman English II | 3 | 3 | 0 | 0 | ENG 101 | |
| ENG 222 | Technical Writing | 3 | 3 | 0 | 0 | ENG 112 | |
| ISL 101 | Islamic Studies I | 2 | 2 | 0 | 0 | | |
| ISL 112 | Islamic Studies II | 2 | 2 | 0 | 0 | ISL 101 | |
| ARB 101 | Arabic Language and Literature I | 2 | 2 | 0 | 0 | | |
| ARB 112 | Arabic Language and Literature II | 2 | 2 | 0 | 0 | ARB 101 | |

II. Core Requirements (92 CRHs)

1. Industrial Engineering Courses (45 CRHs)

| Course Code | Course-Title | Credit Hours (CRHs) | | | | Pre-Requisite Course Code | Co-Requisite Course Code |
|-------------|--|---------------------|------|-----|-----|---------------------------|--------------------------|
| | | Total-CRHs | Lect | Lab | Tut | | |
| IE 301 | Operations Research I | 3 | 3 | 0 | 0 | MAT 212 | |
| IE 302 | Operations Research II | 3 | 3 | 0 | 0 | IE 301, STA 212 | |
| IE 304 | Production and Service Systems Planning I | 3 | 3 | 0 | 0 | STA 212 | IE 301 |
| IE 305 | Production and Service Systems Planning II | 3 | 3 | 0 | 0 | IE 304 | |
| IE 307 | Work System Analysis & Design | 3 | 3 | 0 | 0 | STA 212 | |
| IE 307 L | Work System Analysis & Design Lab | 1 | 0 | 2 | 0 | | IE 307 |
| IE 309 | Human Factors and Ergonomics | 3 | 3 | 0 | 0 | STA 212 | IE 307 |
| IE 309 L | Human Factors and Ergonomics Lab | 1 | 0 | 2 | 0 | | IE 309 |
| IE 315 | Engineering Economy and Cost Analysis | 3 | 3 | 0 | 0 | STA 212 | |
| IE 330 | Simulation | 3 | 3 | 0 | 0 | SE 100, STA 212 | |
| IE 330 L | Simulation Lab | 1 | 0 | 2 | 0 | | IE 330 |
| IE 401 | Network Models and Project Management | 3 | 3 | 0 | 0 | IE 301 | |
| IE 406 | Quality Engineering | 3 | 3 | 0 | 0 | IE 305 | |
| IE 415 | Production Information Systems | 3 | 3 | 0 | 0 | IE 305 | |
| IE 450 | Management for Engineers | 3 | 3 | 0 | 0 | IE 305 | |
| IE 495 | Industrial Engineering Capstone Project I | 3 | 0 | 6 | 0 | IE 302, IE 305 | |
| IE 496 | Industrial Engineering Capstone Project II | 3 | 0 | 6 | 0 | IE 495 | |

2. College of Engineering Courses (38 CRHs)

| Course Code | Course-Title | Credit Hours (CRHs) | | | | Pre-Requisite Course Code | Co-Requisite Course Code |
|-------------|---|---------------------|------|-----|-----|---------------------------|--------------------------|
| | | Total-CRHs | Lect | Lab | Tut | | |
| EE 207 | Foundations of Electrical Engineering | 3 | 3 | 0 | 1 | PHU 124 | MAT 213 |
| EE 207 L | Foundations of Electrical Engineering Lab | 0 | 0 | 2 | 0 | PHU 124 | MAT 213, EE 207 |
| SE 100 | Programming for Engineers | 3 | 3 | 0 | 0 | | |
| SE 100 L | Programming for Engineers Lab | 0 | 0 | 2 | 0 | | SE 100 |
| ME 201 | Materials Science and Engineering | 3 | 3 | 0 | 0 | CHM 102 | |
| ME 201 L | Materials Science and Engineering Lab | 1 | 0 | 2 | 0 | CHM 102 | ME 201 |
| ME 203 | Applied Mechanics I: Statics | 3 | 3 | 0 | 0 | PHU 103, MAT 112 | |
| ME 205 | Introduction to Computer Aided Design | 3 | 3 | 0 | 0 | | |
| ME 206 | Thermal Fluids Engineering I | 3 | 3 | 0 | 0 | PHU 103 | |
| ME 206 L | Thermal Fluids Engineering I Lab | 1 | 0 | 2 | 0 | PHU 103 | ME 206 |
| ME 208 | Mechanics of Materials I | 3 | 3 | 0 | 0 | ME 201 | |
| ME 208 L | Mechanics of Materials I Lab | 1 | 0 | 2 | 0 | ME 201 | ME 208 |
| ME 305 | Manufacturing and Workshop Training | 3 | 3 | 0 | 0 | ME 201 | |
| ME 305 L | Manufacturing and Workshop Training Lab | 1 | 0 | 2 | 0 | ME 201 | ME 305 |
| ME 306 | Instrumentation and Control Engineering | 3 | 3 | 0 | 0 | EE 207 | |
| ME 306 L | Instrumentation and Control Engineering Lab | 1 | 0 | 2 | 0 | EE 207 | ME 306 |
| ME 308 | Advanced Manufacturing Processes | 3 | 3 | 0 | 0 | ME 305 | |
| ME 308 L | Advanced Manufacturing Processes Lab | 1 | 0 | 2 | 0 | ME 305 | ME 308 |

3. Technical Electives (9 CRHs)

Select from the following courses:

| Course Code | Course-Title | Credit Hours (CRHs) | | | | Pre-Requisite Course Code | Co-Requisite Course Code |
|---------------|---|---------------------|----------|----------|----------|---|--------------------------|
| | | Total-CRHs | Lect | Lab | Tut | | |
| IE 400 | Special Topics in Industrial Engineering | 3 | 3 | 0 | 0 | IE 305 | |
| IE 420 | Reliability and Maintenance Engineering | 3 | 3 | 0 | 0 | IE 305 | |
| IE 430 | New Product Development | 3 | 3 | 0 | 0 | IE 309 | |
| IE 435 | Undergraduate Research in Industrial Engineering | 3 | 0 | 6 | 0 | Department approval. A GPA of at least 3.0/4.0, and a signed research contract | |
| IE 440 | Heuristic Methods for Optimization | 3 | 3 | 0 | 0 | IE 302 | |
| IE 445 | Cognitive Ergonomics | 3 | 3 | 0 | 0 | IE 309 | |
| IE 455 | Data Mining and Application in Engineering | 3 | 3 | 0 | 0 | IE 330 | |
| IE 460 | Industrial IoT | 3 | 3 | 0 | 0 | IE 330 | |

4. Summer Internship (0 CRHs)

| Course Code | Course-Title | Credit Hours (CRHs) | Pre-Requisite Course Code | Co-Requisite Course Code |
|---------------|---|---------------------|----------------------------|--------------------------|
| IE 390 | Industrial Engineering Summer Internship | 0 | Department Approval | |

Typical Study Plan-Industrial Engineering Program

4-Year Curriculum: 142 Credit Hours Total

Each course below follows the following format:

Course Code, Course Title, and Course Credit Hours (Lecture contact hours – Lab contact hours – Tutorial contact hours)

| <i>1st Year</i> | | | |
|----------------------------|--------------------|---|-------------|
| Fall | Course Code | Course-Title | CRHs |
| | SE 100 | Programming for Engineers | 3 (3-0-0) |
| | SE 100 L | Programming for Engineers Lab | 1 (0-2-0) |
| | CHM 102 | Introduction to Chemistry | 3 (3-0-1) |
| | CHM 102 L | Introduction to Chemistry Lab | 1 (0-2-0) |
| | MAT 101 | Calculus I | 3 (3-0-0) |
| | PHU 103 | Mechanics and Waves for Engineers | 3 (3-0-1) |
| | PHU 103 L | Mechanics and Waves for Engineers Lab | 1 (0-2-0) |
| | ENG 101 | Freshman English I | 3 (3-0-0) |
| Total | | | 18 |
| Spring | Course Code | Course-Title | CRHs |
| | ME 201 | Materials Science and Engineering | 3 (3-1-0) |
| | ME 201 L | Materials Science and Engineering Lab. | 1 (0-2-0) |
| | MAT 112 | Calculus II | 3 (3-0-0) |
| | PHU 124 | Electromagnetism and Optics for Engineers | 3 (3-2-1) |
| | PHU 124 L | Electromagnetism and Optics for Engineers Lab | 1 (0-2-0) |
| | ARB 101 | Arabic Language and Literature I | 2 (3-0-0) |
| | ENG 112 | Freshman English II | 3 (3-0-0) |
| Total | | | 16 |

| <i>2nd Year</i> | | | |
|----------------------------|-------------|---|-----------|
| Fall | Course Code | Course-Title | CRHs |
| | ME 203 | Applied Mechanics I: Statics | 3 (3-0-0) |
| | ME 205 | Introduction to Computer Aided Design | 3 (3-0-0) |
| | ME 305 | Manufacturing and Workshop Training | 3 (3-0-0) |
| | ME 305 L | Manufacturing and Workshop Training Lab | 1 (0-2-0) |
| | MAT 211 | Calculus III | 3 (3-0-0) |
| | MAT 212 | Linear Algebra | 3 (3-0-0) |
| | MAT 213 | Differential Equations | 3 (3-0-0) |
| Total | | | 19 |
| Spring | Course Code | Course-Title | CRHs |
| | EE 207 | Foundations of Electrical Engineering | 3 (3-0-1) |
| | EE 207 L | Foundations of Electrical Engineering Lab | 1 (0-2-0) |
| | ME 206 | Thermal Fluids Engineering I | 3 (3-0-0) |
| | ME 206 L | Thermal Fluids Engineering I Lab | 1 (0-2-0) |
| | ME 208 | Mechanics of Materials I | 3 (3-0-0) |
| | ME 208 L | Mechanics of Materials I Lab | 1 (0-2-0) |
| | MAT 224 | Numerical Methods | 3 (3-0-0) |
| | STA 212 | Probability and Statistics for Engineers | 3 (3-0-0) |
| Total | | | 18 |

| <i>3rd Year</i> | | | |
|----------------------------|--------------------|---|------------------|
| Fall | Course Code | Course-Title | CRHs |
| | IE 301 | Operations Research I | 3 (3-0-0) |
| | IE 304 | Production and Service Systems Planning I | 3 (3-0-0) |
| | IE 307 | Work Systems Analysis & Design | 3 (3-0-0) |
| | IE 307 L | Work Systems Analysis & Design Lab | 1 (0-2-0) |
| | IE 309 | Human Factors and Ergonomics | 3 (3-0-0) |
| | IE 309 L | Human Factors and Ergonomics Lab | 1 (0-2-0) |
| | ENG 222 | Technical Writing | 3 (3-0-0) |
| | ISL 101 | Islamic Studies I | 2 (2-0-0) |
| Total | | | 19 |
| Spring | Course Code | Course-Title | CRHs |
| | IE 302 | Operations Research II | 3 (3-0-0) |
| | IE 305 | Production and Service Systems Planning II | 3 (3-0-0) |
| | IE 315 | Engineering Economy and Cost Analysis | 3 (3-0-0) |
| | IE 330 | Simulation | 3 (3-0-0) |
| | IE 330 L | Simulation Lab | 1 (0-2-0) |
| | ME 308 | Advanced Manufacturing Processes | 3 (3-0-0) |
| | ME 308 L | Advanced Manufacturing Processes Lab | 1 (0-2-0) |
| Total | | | 17 |
| Summer | Course Code | Course-Title | CRHs |
| | IE 390 | Industrial Engineering Summer Internship | 0 (0-0-0) |
| Total | | | 0 |

| 4th Year | | | |
|----------------------------|--------------------|--|------------------|
| Fall | Course Code | Course-Title | CRHs |
| | IE 401 | Network Models and Project Management | 3 (3-0-0) |
| | IE 415 | Production Information Systems | 3 (3-0-0) |
| | IE 4** | Technical Elective | 3 (3-0-0) |
| | IE 4** | Technical Elective | 3 (3-0-0) |
| | IE 495 | Industrial Engineering Capstone Project I | 3 (0-6-0) |
| | ISL 112 | Islamic Studies II | 2 (2-0-0) |
| Total | | | 17 |
| Spring | Course Code | Course-Title | CRHs |
| | IE 406 | Quality Engineering | 3 (3-0-0) |
| | IE 450 | Management for Engineers | 3 (3-0-0) |
| | IE 4** | Technical Elective | 3 (3-0-0) |
| | IE 496 | Industrial Engineering Capstone Project II | 3 (0-6-0) |
| | ME 306 | Instrumentation and Control Engineering | 3 (3-0-0) |
| | ME 306 L | Instrumentation and Control Engineering Lab | 1 (0-2-0) |
| | ARB 112 | Arabic Language and Literature II | 2 (2-0-0) |
| Total | | | 18 |

Course Descriptions

In this section we give the course descriptions of Architectural Engineering courses of the program.

Each course below follows the following format:

Course Code Course Title Course Credit Hours (Lecture contact hours–Lab contact hours–Tutorial contact hours)

Course Description

Pre-requisites

Co-requisites

IE 301 Operations Research I 3 (3-0-0)

The course includes deterministic operations research modelling concepts; linear programming modelling, simplex theory, duality and sensitivity analysis with economic interpretation; transportation and assignment problems; integer programming; branch and bound techniques; nonlinear optimization problems; multi-criteria decision making.

Pre-requisites: MAT 212

Co-requisites: none

IE 302 Operations Research II 3 (3-0-0)

This course introduces probability models used to investigate the behaviour of industrial systems. It teaches decision making under uncertainty, elementary counting processes, Markov chains and Markov processes. Stochastic programming and applications. Stochastic models in queuing systems, inventories, and equipment reliability are also addressed.

Pre-requisites: IE 301, STA 212

Co-requisites: none

IE 304 Production and Service Systems Planning I 3 (3-0-0)

The course teaches theory and concepts involved in model formulation for the analysis and control of production processes, including systems for planning and controlling production and service systems to achieve productivity and efficiency. The course addresses the basic issues in production planning, including aggregate production planning, master production schedule, materials requirement planning, and capacity planning. Flexible manufacturing systems, lean manufacturing, Just-in-time (JIT), and new concepts in manufacturing are addressed. Various production systems are described, including job shops, flow shop, cellular manufacturing covering scheduling and optimization.

Pre-requisites: STA 212

Co-requisites: IE 301

IE 305 Production and Service Systems Planning II 3 (3-0-0)

The course teaches aspects of planning and design of logistics and inventory management in production and service systems. Optimization issues in supply chain management, distribution systems and routing, inventory control and warehousing, distributed networks, centralized and decentralized networks, facility location and layout, supply chain and strategic partnerships are addressed.

Pre-requisites: IE 304

Co-requisites: none

IE 307 Work Systems Analysis and Design 3 (3-0-0)

The course teaches survey of methods for assessing and improving performance of individuals and groups in organizations. Techniques include various basic industrial engineering tools, work analysis, data acquisition and application, performance evaluation and appraisal, work measurement procedures and motion study. Layout design of work environments will include material handling systems and warehousing.

Pre-requisites: STA 212

Co-requisites: none

IE 307 L Work Systems Analysis and Design Lab 1 (0-2-0)

Laboratory experiments dealing with work systems analysis and design.

Pre-requisites: none

Co-requisites: IE 307



- IE 309 Human Factors and Ergonomics** **3 (3-0-0)**
The course teaches analysis of tools, work spaces and activities to achieve efficiency in modern work environments are introduced. The effects of vibration, noise, illumination, control display design, age and shift work on the performance of workers are discussed. Physiological and psychological capabilities and limitations in human factors, ergonomic measurement methods and analytical techniques, design of tools and the working ergonomic environment are addressed.
Pre-requisites: STA 212
Co-requisites: IE 307
- IE 309 L Human Factors and Ergonomics Lab** **1 (0-2-0)**
Laboratory experiments dealing with human factors and ergonomics.
Pre-requisites: none
Co-requisites: IE 309
- IE 315 Engineering Economy and Cost Analysis** **3 (3-0-0)**
The course teaches economic analysis in an engineering environment considering the time value of money. Methods for evaluation of alternatives: present worth, annual equivalent worth, rate of return, payback method and benefit-cost ratio method. Replacement analysis, depreciation, inflation and cost estimation. Sensitivity and risk analysis are also considered.
Pre-requisites: STA 212
Co-requisites: none
- IE 330 Simulation** **3 (3-0-0)**
This course teaches simulation modelling and analysis of production and service systems, including simulation methodology, model building in a computer environment, analysing performance measures and assessment of different policies. It also teaches simulation languages, basic and advanced modules, and statistical aspects of simulation such as fitting of input and output distributions. Validation and verification of simulation models are also covered.
Pre-requisites: SE 100, STA 212
Co-requisites: none
- IE 330 L Simulation Lab** **1 (0-2-0)**
Laboratory experiments dealing with the implantation of discrete-event simulation models.
Pre-requisites: none
Co-requisites: IE 330
- IE 400 Special Topics in Industrial Engineering** **3 (3-0-0)**
This course provides instruction and experience in timely topics related to Industrial Engineering major.
Pre-requisites: IE 305
Co-requisites: none
- IE 401 Network Models and Project Management** **3 (3-0-0)**
The course teaches the terminology of graphs and networks, network flow problems, algorithms and solutions. Project management, defining the project, scheduling issues in projects, project duration optimization, resources planning, evaluation and progress, estimating times and costs, critical processes in the projects, applications of project-planning and software in the strategy of projects, integration of organization with projects and probability issues in project planning are addressed.
Pre-requisites: IE 301
Co-requisites: none
- IE 406 Quality Engineering** **3 (3-0-0)**
The course teaches Quality Assurance in an industrial system and compares it with the existing standards and protocols, including an introduction to quality engineering, quality standards ISO 9000 and QS 9000, TQM, quality cost analysis, process modeling and hypothesis testing, statistical process control for long and short production runs, process capability analysis, capability indexes, Weibull analysis, Six sigma acceptance sampling and design of experiments.
Pre-requisites: IE 305
Co-requisites: none



IE 415 Production Information Systems

3 (3-0-0)

The course teaches the design and analysis of production information systems, critical success factors for companies, effectiveness and efficiency through information systems usage in production and service systems, success cases in industry. Investigation of data modelling, storage, acquisition and utilization in Industrial Engineering via manual and computerized methods. Development of effective spreadsheet applications, design and implementation of relational databases via E-R modelling, relational schema, normalization, SQL (Standard Query Language), web-based database applications, interface design, the system development life cycle applied to data management applications, ERP (Enterprise Resource Planning) software and decision support systems are addressed.

Pre-requisites: IE 305

Co-requisites: none

IE 420 Reliability and Maintenance Engineering

3 (3-0-0)

This course provides an introduction to the life-cycle costing concept for equipment maintenance and replacement. Emphasis will be on the development of mathematical and simulation models for determining optimal maintenance and replacement policies for both capital equipment and components.

Pre-requisites: IE 305

Co-requisites: none

IE 430 New Product Development

3 (3-0-0)

This course presents state-of-the-art Product Development techniques focusing on the interdisciplinary nature of the product design activities.

Pre-requisites: IE 309

Co-requisites: none

IE 435 Undergraduate Research in Industrial Engineering

3 (0-6-0)

Students participate in supervised research with a faculty member. Supervised research can be: 1) independent research undertaken by the student (thesis, independent study), or 2) assistance on a faculty member's research project. Students must find a faculty member who is willing to supervise him/her as an assistant on an existing project or as the author of an individual project. The student and the faculty supervisor will complete and sign a research contract which will be turned in to the chair of the Industrial and Mechanical Engineering Department. Drafting the contract will allow the student to develop ideas about what should be accomplished and what the faculty supervisor's expectations are. All academic requirements are at the discretion of the supervising faculty member. Students should agree on a plan for the semester with the faculty mentor before the research begins. The plan should include academic requirements, the basis for grading the experience, and a plan for student/professor meetings for the semester. It is the student's responsibility to report progress and seek guidance when needed. Students are expected to be active and reliable participants in the research experience.

Pre-requisites: GPA of at least 3.0/4.0, a signed research contract, and consent of the departmental chair.

Co-requisites: none

IE 450 Management for Engineers

3 (3-0-0)

The course focuses on learning to see and understand the fundamental activities of businesses as practiced worldwide and how to manage them. Successfully performing these activities requires vision, passion, leadership, teamwork, and integrating the many functional disciplines of business.

Pre-requisites: IE 305

Co-requisites: none

IE 495 Industrial Engineering Capstone Project I

3 (0-6-0)

Students work in teams as professional engineering consultants on an independent engineering project under the supervision of a project advisor. The design process is emphasized, encompassing project definition, feasibility analysis, evaluation of alternative designs, and design computations. For each project, the scope of work is developed and negotiated between client and student consultants. The scope of work may also include fabrication, device testing, and field-testing. Projects are arranged by the students with approval of the instructor. Progress reports and a final written report are submitted to the student's project advisor. Oral presentations of reports are made before the faculty and students. A student who selects a project suggested by industry has the opportunity of working with an industry sponsor in an actual engineering experience.

Pre-requisites: IE 302, IE 305

Co-requisites: none



IE 496 Industrial Engineering Capstone Project II

3 (0-6-0)

Students work in teams as professional engineering consultants on an independent engineering project under the supervision of a project advisor. The design process is emphasized, encompassing project definition, feasibility analysis, evaluation of alternative designs, and design computations. For each project, the scope of work is developed and negotiated between client and student consultants. The scope of work may also include fabrication, device testing, and field-testing. Projects are arranged by the students with approval of the instructor. Progress reports and a final written report are submitted to the student's project advisor. Oral presentations of reports are made before the faculty and students. A student who selects a project suggested by industry has the opportunity of working with an industry sponsor in an actual engineering experience.

Pre-requisites: IE 495

Co-requisites: none



Alfaisal University
Bachelor of Industrial Engineering
Study Plan Summary
Effective: Fall 2019



| | | |
|-----------------|---------------------------|-----------------------------|
| Student: | ID#: | Email: |
| Advisor: | Starting Semester: | Expected Graduation: |

4-Year Curriculum: 142 Credit Hours Total

| Freshman Year - Fall Semester | | | | |
|-------------------------------|---------------------------------------|-----------|----------------|-----------------|
| Course Code | Course-Title | CRHs | Semester Taken | Retake/Transfer |
| SE 100 | Programming for Engineers | 3 | | |
| SE 100 L | Programming for Engineers Lab | 1 | | |
| CHM 102 | Introduction to Chemistry | 3 | | |
| CHM 102 L | Introduction to Chemistry Lab | 1 | | |
| MAT 101 | Calculus I | 3 | | |
| PHU 103 | Mechanics and Waves for Engineers | 3 | | |
| PHU 103 L | Mechanics and Waves for Engineers Lab | 1 | | |
| ENG 101 | Freshman English I | 3 | | |
| Total | | 18 | | |

| Freshman Year - Spring Semester | | | | |
|---------------------------------|---|-----------|----------------|-----------------|
| Course Code | Course-Title | CRHs | Semester Taken | Retake/Transfer |
| ME 201 | Material Science and Engineering | 3 | | |
| ME 201 L | Material Science and Engineering Lab | 1 | | |
| MAT 112 | Calculus II | 3 | | |
| PHU 124 | Electromagnetism and Optics for Engineers | 3 | | |
| PHU 124 L | Electromagnetism and Optics for Engineers Lab | 1 | | |
| ARB 101 | Arabic Language and Literature I | 2 | | |
| ENG 112 | Freshman English II | 3 | | |
| Total | | 16 | | |

| Sophomore Year - Fall Semester | | | | |
|--------------------------------|---|-----------|----------------|-----------------|
| Course Code | Course-Title | CRHs | Semester Taken | Retake/Transfer |
| ME 203 | Applied Mechanics I: Statics | 3 | | |
| ME 205 | Introduction to Computer Aided Design | 3 | | |
| ME 305 | Manufacturing and Workshop Training | 3 | | |
| ME 305 L | Manufacturing and Workshop Training Lab | 1 | | |
| MAT 211 | Calculus III | 3 | | |
| MAT 212 | Linear Algebra | 3 | | |
| MAT 213 | Differential Equations | 3 | | |
| Total | | 19 | | |

| Sophomore Year - Spring Semester | | | | |
|----------------------------------|---|-----------|----------------|-----------------|
| Course Code | Course-Title | CRHs | Semester Taken | Retake/Transfer |
| EE 207 | Foundations of Electrical Engineering | 3 | | |
| EE 207 L | Foundations of Electrical Engineering Lab | 1 | | |
| ME 206 | Thermal Fluids Engineering I | 3 | | |
| ME 206 L | Thermal Fluids Engineering I Lab | 1 | | |
| ME 208 | Mechanics of Materials I | 3 | | |
| ME 208 L | Mechanics of Materials I Lab | 1 | | |
| MAT 224 | Numerical Methods | 3 | | |
| STA 212 | Probability and Statistics for Engineers | 3 | | |
| Total | | 18 | | |

| Junior Year - Fall Semester | | | | |
|-----------------------------|---|-----------|----------------|-----------------|
| Course Code | Course-Title | CRHs | Semester Taken | Retake/Transfer |
| IE 301 | Operations Research I | 3 | | |
| IE 304 | Production and Service Systems Planning I | 3 | | |
| IE 307 | Work Systems Analysis & Design | 3 | | |
| IE 307 L | Work Systems Analysis & Design Lab | 1 | | |
| IE 309 | Human Factors and Ergonomics | 3 | | |
| IE 309 L | Human Factors and Ergonomics | 1 | | |
| ENG 222 | Technical Writing | 3 | | |
| ISL 101 | Islamic Studies I | 2 | | |
| Total | | 19 | | |

| Junior Year - Spring Semester | | | | |
|-------------------------------|--|-----------|----------------|-----------------|
| Course Code | Course-Title | CRHs | Semester Taken | Retake/Transfer |
| IE 302 | Operations Research II | 3 | | |
| IE 305 | Production and Service Systems Planning II | 3 | | |
| IE 315 | Engineering Economy and Cost Analysis | 3 | | |
| IE 330 | Simulation | 3 | | |
| IE 330 L | Simulation Lab | 1 | | |
| ME 308 | Advanced Manufacturing Processes | 3 | | |
| ME 308 L | Advanced Manufacturing Processes Lab | 1 | | |
| Total | | 17 | | |

| Junior Year - Summer Semester | | | | |
|-------------------------------|--|----------|----------------|-----------------|
| Course Code | Course-Title | CRHs | Semester Taken | Retake/Transfer |
| IE 390 | Industrial Engineering Summer Internship | 0 | | |
| Total | | 0 | | |

| Senior Year - Fall Semester | | | | |
|-----------------------------|---|-----------|----------------|-----------------|
| Course Code | Course-Title | CRHs | Semester Taken | Retake/Transfer |
| IE 401 | Network Models and Project Management | 3 | | |
| IE 415 | Production Information Systems | 3 | | |
| IE 4 __ | Technical Elective | 3 | | |
| IE 4 __ | Technical Elective | 3 | | |
| IE 495 | Industrial Engineering Capstone Project I | 3 | | |
| ISL 112 | Islamic Studies II | 2 | | |
| Total | | 17 | | |

| Senior Year - Spring Semester | | | | |
|-------------------------------|---|-----------|----------------|-----------------|
| Course Code | Course-Title | CRHs | Semester Taken | Retake/Transfer |
| IE 406 | Quality Engineering | 3 | | |
| IE 450 | Management for Engineers | 3 | | |
| IE 4 __ | Technical Elective | 3 | | |
| IE 496 | Industrial Engineering Capstone Project II | 3 | | |
| ME 306 | Instrumentation and Control Engineering | 3 | | |
| ME 306 L | Instrumentation and Control Engineering Lab | 1 | | |
| ARB 112 | Arabic Language and Literature II | 2 | | |
| Total | | 18 | | |

Alfaisal University – Bachelor of Industrial Engineering Prerequisites Chart (Effective Fall 2019)

