

# Major Minor Industrial Engineering

## Program

College of Engineering and Advanced Computing

Major

Minor

## Bachelor of Industrial Engineering Study Plan

### Fall (Year 1)

Item #	Title	Credits
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 Labs	1
ENG 101	Freshman English 1	3

### Spring (Year 1)

Item #	Title	Credits
ME 201	Materials Science and Engineering	3
ME 201 L	Materials Science and Engineering Lab	1
MAT 112	Calculus II	3
PHU 124	Electromagnetism and Waves for Engineers	3
PHU 124 L	Electromagnetism and Waves for Engineers Labs	1
ARB 101	Arabic Language I	2
ENG 112	Freshman English II	3

### Fall (Year 2)

Item #	Title	Credits
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

## Spring (Year 2)

Item #	Title	Credits
BME 207	Electrical Circuits in Biomedical Engineering	3
BME 207 L	Electrical Circuits in Biomedical Engineering	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

## Fall (Year 3)

Item #	Title	Credits
IE 301	Operations Research I	3
IE 304	Production and Service Systems Planning I	3
IE 307	Work Systems Analysis and Design	3
IE 307 L	Work Systems Analysis and Design Lab	1
IE 309	Human Factors and Ergonomics	3
IE 309 L	Human Factors and Ergonomics Lab	1
ENG 222	Technical Writing	3
ISL 101	Islamic Studies I	2

## Spring (Year 3)

Item #	Title	Credits
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

## Summer (Year 3)

Item #	Title	Credits
IE 390	Industrial Engineering Summer Internship	0

## Fall (Year 4)

Item #	Title	Credits
IE 401	Network Models and Project Management	3
IE 415	Production Information Systems	3

	IE 4-- (any 400-level course) Technical Elective	3
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IE 495	Industrial Engineering Capstone Project I	3
ISL 112	Islamic Studies II	2

## Spring (Year 4)

Item #	Title	Credits
IE 406	Quality Engineering	3
IE 450	Management for Engineers	3
	IE 4-- (any 400-level course) 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 II	2

## Technical Electives

Item #	Title	Credits
IE 400	Special Topics in Industrial Engineering	3
IE 420	Reliability and Maintenance Engineering	3
IE 421	Product Design and Development	3
	IE 4-- (any 400-level course) Technical Elective	3
IE 430	New Product Development	3
IE 435	Undergraduate Research in Industrial Engineering	3
IE 440	Heuristic Methods for Optimization	3
IE 455	Cognitive Ergonomics	3
IE 460	Industrial IoT	3

## Industrial Engineering Track: Digital Design and Manufacturing

Industrial Engineering (IE) students have the option to select electives in the fourth year according to their desired academic objective in consultation with their academic advisor. Regular non-track students select any three of the offered IE electives in the fourth year. IE students also have the option to follow the Digital Design and Manufacturing track in the program. Irrespective of whether a student opts for the Digital Design and Manufacturing track or not, the total credits for electives must be 9 CRHs. All offered technical electives are available for regular non-track students, whether they opt for the track or not.

In summary, all IE students follow the same curriculum and take the same required courses, with the difference being the designation of the electives in the fourth year.

Per standing policy, and with the approval of the department chair, a student may opt to take one of the 3 CRH technical electives from another engineering program.

# Digital Design and Manufacturing Track

The industrial and information revolutions made tremendous impact on manufacturing and communication systems of today. Technologies developed in those revolutions are fusing into a new industrial revolution now known as Industry 4.0 where digital information is inherent in manufacturing activities. Industry 4.0 changes the way products are designed and manufactured today and will revolutionize product development in future.

Industrial Engineering (IE) department, in conjunction with the Mechanical Engineering (ME) department, offers the Digital Design and Manufacturing track to prepare students for Industry 4.0. Students opting for this track will gain focused knowledge by taking electives offered by ME and IE departments in this interdisciplinary area.

## Track Course Requirements

Students must complete the following (6 CRHs) core courses:

Item #	Title	Credits
ME 308	Advanced Manufacturing Processes	3
IE 315	Engineering Economy and Cost Analysis	3
Students will need to complete three courses (9 CRHs) from this list		

A student opting for the Digital Design and Manufacturing track can take two and one electives in the Fall and Spring semesters, respectively or vice versa based on electives distribution in the fourth year.

## Minor in Industrial Engineering (for ME students)

IE department offers a minor in Industrial Engineering which is open to ME students only. Students opting for this minor will gain concentrated knowledge by taking advanced IE courses.

Students taking the IE minor are expected to take additional 15 CRHs on top of their existing ME study plan courses from the following list of existing ME courses:

## Required Courses

### 6 CRHs

Item #	Title	Credits
IE 301	Operations Research I	3
IE 304	Production and Service Systems Planning I	3

## Optional Courses

### Select 9 CRHs

Item #	Title	Credits
IE 307	Work Systems Analysis and Design	3
IE 307 L	Work Systems Analysis and Design Lab	1
IE 315	Engineering Economy and Cost Analysis	3

IE 330	Simulation	3
IE 330 L	Simulation Lab	1
IE 406	Quality Engineering	3
IE 450	Management for Engineers	3

## General Guidelines

1. The student must complete a total of additional 15 CRHs from IE department
2. Entry Point: Nominally before or at end of Year 2 (sophomore-level) to allow for sufficient time to complete all the courses.
3. The student must have a minimum GPA of 3.25. Admission to the minor is subject to the approval of the ME and IE departments.
4. The student should complete the main degree requirements before starting the minor.
5. Any of the pre-approved courses can be taken whenever the course is offered by IE department and subject to prevailing academic regulations.
6. Lab courses cannot be taken on their own. A Lab course has to be taken with or after the corresponding course has been taken.
7. Completion of a minor program is posted on the transcript alongside the main major. Minor programs are not noted on diplomas.