

INDUSTRIAL ENGINEERING (BS)



This program was approved for students entering the university in the Summer 2023–Spring 2024 catalog year. For more information about catalog year, go to Catalog Year Information (<http://catalog.louisville.edu/undergraduate/university-wide-unit-specific-policies/catalog-year/>).

Bachelor of Science in Industrial Engineering

Unit: Speed School of Engineering (<https://engineering.louisville.edu>) (SS)

Department: Industrial Engineering (<http://engineering.louisville.edu/industrial/>)

Academic Plan Code(s): IE_ _BIE

Program Information

The Bachelor of Science in Industrial Engineering degree program is accredited by the Engineering Accreditation Commission of ABET, www.abet.org (<http://www.abet.org>). The Master of Engineering in Industrial Engineering degree program is accredited by the Engineering Accreditation Commission of ABET, www.abet.org (<http://www.abet.org>).

Degree Summary

Code	Title	Hours
	General Education Requirements (http://catalog.louisville.edu/undergraduate/general-education-requirements/) ¹	31
	(19 hours of General Education requirements may be satisfied through coursework required by the degree program)	
	College/School Requirements ¹	35
	Program/Major Requirements	62
	Supporting Courses	15
	Minimum Total Hours	124

¹ Some courses required in this degree program satisfy multiple requirements. To complete the degree in the **minimum number of hours listed**, some hours from the General Education Requirements must be satisfied by courses defined by the unit and/or program. Using other courses to satisfy General Education requirements will require additional hours to complete the degree requirements. See the Degree Requirements and/or Track tabs for specific coursework.

Specific coursework information can be found on the Degree Requirements tab.

Accelerated BS Pathway

Industrial Engineering majors that are interested in pursuing an MS IE or MEng EM (Online) can consider an Accelerated Pathway. For more information, see the "Accelerated BSIE Pathway" Tab.

Incoming Student Admission Criteria

High School Curriculum Requirements: All schools require graduation from an accredited high school and completion of the Kentucky Pre-College Curriculum requirements. In addition, Speed School requires successful completion of the following courses in high school:

- Calculus or pre-calculus
- Chemistry

Students with ACT / SAT Scores

- ACT composite and math scores of 25 OR SAT combined CR+M score of 1200 and math score of 590. A 3.0 GPA on a 4.0 scale

OR

- ACT composite and math scores of 24 OR SAT combined CR+M score of 1160 and math score of 570. A 3.5 GPA on a 4.0 scale

Students without ACT / SAT Scores

- HS GPA of 3.0 (or better) on a 4.0 scale
- Comprehensive transcript evaluation
- Review of Student Resume

Transferring to Engineering BS degree programs

Students with 24 hours or more transferable semester hours will have a minimum college grade point average of 2.8 and at least B-minus grades in each of the following courses: ENGR 181 (or equivalent) and Intro to Chemistry (CHEM 101 or equivalent).

It is recommended students successfully complete Physics I (PHYS 298 or equivalent) before transferring to the J.B. Speed School of Engineering.

General Education Requirements

Code	Title	Hours
	General Education Requirements (http://catalog.louisville.edu/undergraduate/general-education-requirements/) ¹	31
The following courses are required by the program and satisfy the respective General Education Requirement(s):		
CHEM 201	General Chemistry I - S (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	
CHEM 207	Introduction to Chemical Analysis I - SL (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	
COMM 111	Introduction to Public Speaking - OC (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	

or COMM 112 Business and Professional Speaking - OC (<http://catalog.louisville.edu/undergraduate/general-education-requirements/>)

ENGL 101	Introduction to College Writing - WC (http://catalog.louisville.edu/undergraduate/general-education-requirements/)
ENGL 102	Intermediate College Writing - WC (http://catalog.louisville.edu/undergraduate/general-education-requirements/)
ENGR 101	Engineering Analysis I - QR (http://catalog.louisville.edu/undergraduate/general-education-requirements/)
PHYS 298	Introductory Mechanics, Heat and Sound - S (http://catalog.louisville.edu/undergraduate/general-education-requirements/)

All degrees require the completion of the University-wide General Education Program (link provided above). To complete the degree in the **minimum number of hours** listed on the Overview tab, some hours from the General Education Requirements must be satisfied by courses defined by the unit and/or program. Using other courses to satisfy General Education requirements will require additional hours to complete the degree requirements.

College/School Requirements

Code	Title	Hours
Speed School Core		
CHEM 201	General Chemistry I - S (http://catalog.louisville.edu/undergraduate/general-education-requirements/) ²	3
CHEM 207	Introduction to Chemical Analysis I - SL (http://catalog.louisville.edu/undergraduate/general-education-requirements/) ²	1
COMM 111	Introduction to Public Speaking - OC (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	3
or COMM 112	Business and Professional Speaking - OC (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	3
ENGL 101	Introduction to College Writing - WC (http://catalog.louisville.edu/undergraduate/general-education-requirements/) ^{2,3}	3
ENGL 102	Intermediate College Writing - WC (http://catalog.louisville.edu/undergraduate/general-education-requirements/) ^{2,3}	3
ENGR 101	Engineering Analysis I - QR (http://catalog.louisville.edu/undergraduate/general-education-requirements/) ²	4
ENGR 102	Engineering Analysis II	4
ENGR 110	Engineering Methods, Tools, and Practice I	2
ENGR 111	Engineering Methods, Tools and Practice II	2
ENGR 201	Engineering Analysis III	4
ENGR 205	Differential Equations for Engineering	2
PHYS 298	Introductory Mechanics, Heat and Sound - S (http://catalog.louisville.edu/undergraduate/general-education-requirements/) ²	4
Minimum Total Hours		35

Program/Major Requirements

Code	Title	Hours
Industrial Engineering Department		
IE 240	Fundamentals of Industrial Engineering	3
IE 250	Data Management and Spreadsheet Modelings for Industrial Engineering	3
IE 288	Industrial Engineering Cooperative Education Seminar	0
IE 289	Industrial Engineering Cooperative Education I	1
IE 320	Manufacturing Processes	4
IE 360	Probability and Statistics for Engineers	3
IE 361	Developing Decision Support Systems with Excel	3
IE 370	Engineering Economic Analysis	3
IE 380	Work Design	3
IE 389	Industrial Engineering Cooperative Education II	1
IE 419	Advanced Manufacturing Systems	3
IE 421	Facility Location and Layout	3
IE 425	Production and Inventory Control	3
IE 430	Quality Control	3
IE 489	Industrial Engineering Cooperative Education III	1
IE 499	IE Capstone Design - CUE (http://catalog.louisville.edu/undergraduate/general-education-requirements/) (CUE)	3
IE 515	Operations Research Methods	3
IE 541	Simulation	3
IE 563	Experimental Design in Engineering	3
IE 580	Introduction to Human Factors Engineering and Ergonomics	3
IE Electives		6
Industrial Engineering Core		
CHEM 202	General Chemistry II - S (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	3
PHYS 295	Introductory Laboratories I - SL (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	1
Minimum Total Hours		62
Supporting Courses		
CSE 120	Introduction to Programming with Python	3
CEE 205	Mechanics I: Statics	3
ECE 252	Introduction to Electrical Engineering	3
ME 251	Thermodynamics I	3
ENGR 151	Engineering Graphics Technology	1
ENGR 307	Numerical Methods for Engineering	2
Minimum Total Hours		15

A student may accumulate no more than two D-minus, D, or D+ grades in IE prefixed courses to graduate with a baccalaureate degree. For any additional D-minus, D, or D+ grades beyond two, the student must repeat the course to earn a better grade.

Candidates for the Bachelor of Science degree must be in good standing (university GPA ≥ 2.25) and must attain a GPA of at least 2.25 for all courses used to satisfy degree requirements.

Code	Title	Hours
Culminating Undergraduate Experience (Graduation requirement)		
Requirement fulfilled by completing:		
IE 499	IE Capstone Design - CUE (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	

- ¹ To complete the degree in the minimum number of hours listed, some hours from the General Education Requirements must be satisfied by courses defined by the unit and/or program. Using other courses to satisfy General Education requirements will require additional hours to complete the degree requirements.
- ² This course is a General Education requirement for the program; see louisville.edu/provost/ger/ (<http://www.louisville.edu/provost/ger/>) for the listing, by academic year, of AH/D1/D2/SB/SBH Electives which satisfy the University-wide General Education requirements.
- ³ Students completing ENGL 105 in lieu of ENGL 101 or ENGL 102 satisfy the General Education and Engineering Fundamentals requirements for Written Communication. However, an additional 3-hr Writing (WR) course or honors Written Communication (WC) course may be needed to satisfy program credit hour requirements.

Flight Plan

Year 1		
Fall		
CHEM 201	General Chemistry I - S (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	3
CHEM 207	Introduction to Chemical Analysis I - SL (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	1
ENGL 101	Introduction to College Writing - WC (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	3
ENGR 101	Engineering Analysis I - QR (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	4
ENGR 110	Engineering Methods, Tools, and Practice I	2
General Education: Cardinal Core Arts & Humanities, Social & Behavioral Sciences, or Social & Behavioral Sciences Historical Perspective US Diversity - AHD1, SBD1, or SBHD1		3
Hours		16
Spring		
CHEM 202	General Chemistry II - S (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	3
ENGL 102	Intermediate College Writing - WC (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	3
ENGR 102	Engineering Analysis II	4
ENGR 111	Engineering Methods, Tools and Practice II	2
PHYS 295	Introductory Laboratories I - SL (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	1
PHYS 298	Introductory Mechanics, Heat and Sound - S (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	4
Hours		17
Summer		
ENGR 151	Engineering Graphics Technology	1
ENGR 201	Engineering Analysis III	4
CEE 205	Mechanics I: Statics	3

General Education: Cardinal Core Arts & Humanities, Social & Behavioral Sciences, or Social & Behavioral Sciences Historical Perspective - AH, SB, or SBH		3
Hours		11
Year 2		
Fall		
COMM 111 or COMM 112	Introduction to Public Speaking - OC (http://catalog.louisville.edu/undergraduate/general-education-requirements/) or Business and Professional Speaking - OC (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	3
CSE 120	Introduction to Programming with Python	3
ENGR 205	Differential Equations for Engineering	2
IE 240	Fundamentals of Industrial Engineering	3
IE 250	Data Management and Spreadsheet Modelings for Industrial Engineering	3
IE 288	Industrial Engineering Cooperative Education Seminar	0
IE 380	Work Design	3
Hours		17
Spring		
IE 289	Industrial Engineering Cooperative Education I	1
Hours		1
Summer		
ECE 252	Introduction to Electrical Engineering	3
ENGR 307	Numerical Methods for Engineering	2
IE 360	Probability and Statistics for Engineers	3
IE 370	Engineering Economic Analysis	3
Hours		11
Year 3		
Fall		
IE 389	Industrial Engineering Cooperative Education II	1
Hours		1
Spring		
ME 251	Thermodynamics I	3
IE 320	Manufacturing Processes	4
IE 361	Developing Decision Support Systems with Excel	3
IE 425	Production and Inventory Control	3
IE 430	Quality Control	3
Hours		16
Summer		
IE 489	Industrial Engineering Cooperative Education III	1
Hours		1
Year 4		
Fall		
IE 419	Advanced Manufacturing Systems	3
IE 421	Facility Location and Layout	3
IE 515	Operations Research Methods	3
IE 541	Simulation	3
IE 580	Introduction to Human Factors Engineering and Ergonomics	3
Hours		15
Spring		
IE 499	IE Capstone Design - CUE (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	3
IE 563	Experimental Design in Engineering	3
Industrial Engineering Elective		3
Industrial Engineering Elective		3
General Education: Cardinal Core Arts & Humanities, Social & Behavioral Sciences, or Social & Behavioral Sciences Historical Perspective - AH, SB, or SBH		3

General Education: Cardinal Core Arts & Humanities, Social & Behavioral Sciences, or Social & Behavioral Sciences Historical Perspective - AH, SB, or SBH	3
Hours	18
Minimum Total Hours	124

Degree Audit Report

Degree Audit reports illustrate how your completed courses fulfill the requirements of your academic plan. What-if reports allow you to compare the courses you have completed in your current academic plan to the courses required in another academic plan. Should you have questions about either report, please consult with your academic advisor.

Flight Planner

The Flight Planner tool is available for you to create a personalized Flight Plan to graduation. Advisors have access to review your Flight Planner and can help you adjust it to ensure you remain on track to graduate in a timely manner.

To create these reports:

- a. Log into your ULink account.
- b. Click on the Academic Progress tile.
- c. Select the appropriate report.
 - i. To run a Degree Audit report, click on "View my Degree Audit."
 - ii. To create a What-if report, click on "Create a What-if Advisement Report."
 - iii. To run a Flight Planner report, click on "Use My Flight Planner."

Click here to run a Degree Audit report, create a What-if report, or run a Flight Planner report. (<https://ulink.louisville.edu>)

Accelerated Program Participants

Students accepted into an Accelerated Pathway may substitute select Graduate-level courses for equivalent Undergraduate courses as discussed with their Graduate Program Advisor.

Accelerated BS-MSIE and BS-MEEMO Pathways

Industrial Engineering majors that are interested in pursuing and MS IE or MEng EM (Online) can consider an Accelerated Pathway. The Accelerated Pathway allows 12 credit hours of Graduate Coursework to be counted towards both degrees, speeding up the timeline for overall completion.

Students may apply as early as Summer 2 of the BS IE given they meet the following criteria:

- Completion of 60+ credit hours towards BS IE degree
- Completion of 10+ credit hours in IE coursework
- Current enrollment in, or previous completion of IE 360
- GPA of 3.3 or above

Applications are available in the Department of Industrial Engineering, JB Speed Building Room 304, or online at engineering.louisville.edu/academics/departments/industrial/ (<https://engineering.louisville.edu/academics/departments/industrial/>).

Students who are admitted to the Accelerated Pathway and wish to complete the MSIE or MEEMO degree, should formally submit an application for the Master's Program of their choosing, to the Graduate School when they are nearing completion of the BSIE degree.

The Bachelor of Science in Industrial Engineering (IE BIE) program prepares students to meet the requirements for certification and/or licensure. If you plan to pursue professional licensure or certification you should first determine your state's criteria for examination and licensure to see how/if our program meets those requirements prior to enrollment. We recommend that you also contact your state's licensing board directly to verify that the requirements have not changed recently and to answer any questions especially those regarding additional requirements beyond the degree.

More information about certification or licensure is available at the following website: <https://louisville.edu/oapa/licensure-information> (<https://louisville.edu/oapa/licensure-information/>) (you may search by school or by the name of the program then click on 'View Details' to display the information).

For programs with an online option, more information about certification or licensure is available here: <https://louisville.edu/online/About-Us?tab=disclosures> (<https://louisville.edu/online/About-Us/?tab=disclosures>).