

For Student with I.D. 65xxxxx | 64xxxxx | 63xxxxx

INDUSTRIAL ENGINEERING PROGRAM CATALOG

2020 - 2022

Department of Industrial Engineering
Faculty of Engineering
Mahidol University

Academic Catalog

The Industrial Engineering Program Catalog is provided on the basis of the best information available at the time of publication. It is for informational purposes only and does not constitute a contract. Courses are not necessarily offered each term or each year. Individuals should be consulted from the curriculum and the Department of Industrial Engineering for information regarding of courses offered.

Industrial Engineering Program

Degree Offered

Bachelor of Engineering Program in Industrial Engineering:
B.Eng.(Industrial Engineering)

The Field

This program provides knowledge and skills in Industrial Engineering. The program focuses to build your competency in problem solving and providing engineering solutions. Moreover, communication skills, teamwork skills, learning skills, professional standard and ethics are also provided to craft you to be ready in workplaces. The program gives you not only in-class and laboratory experiences, but factory visits, internship and co-curricular activities are also offered to enhance your perspectives in real practices. Our major classes focus on design and improvement of integrated systems or process that produce and deliver products or service to obtain competitive advantages with the consideration of safety, environment, economy and community.

Career Opportunities

Graduates can work in government and private sectors in the following areas:

- Manufacturing / Production Engineering
 - Safety Engineering
 - Quality Control / Quality Assurance
 - Maintenance
 - Production planning and control
 - Project Management
 - Product Development
 - Logistics and Supply Chain Management
 - Operations management
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Graduates can work as academics or researchers in IE fields.

Curriculum Structure

Course	Credits
General Education Courses	30
Basic Math and Science Courses	30
Required Major Courses	73
Elective Major Courses	9
Free Elective Courses	6
Total	148

Course List

General Education Courses (30 Credits)

Compulsory Courses			7 Credits
MUGE	101	General Education for Human Development	2 (1-2-3)
MUGE	102	Social Studies for Human Development	3 (2-2-5)
MUGE	103	Arts and Sciences for Human Development	2 (1-2-3)

Languages			9 Credits
LATH	100	Arts of Using Thai Language in Communication	3 (2-2-5)
LAEN	103	English Level 1	3 (2-2-5)
LAEN	104	English Level 2	3 (2-2-5)
LAEN	105	English Level 3	3 (2-2-5)
LAEN	106	English Level 4	3 (2-2-5)

Social and Humanity			2 Credits
EGID	300	Philosophy, Ethics and Laws for Engineers	1 (1-0-2)
EGIE	436	Industrial and Commercial Laws	3 (3-0-6)
MSID	101	Music Appreciation	2 (1-2-3)
SHHU	103	Art Appreciation	2 (2-0-4)
SHHU	108	Human Relations and Self Development	2 (2-0-4)
SHHU	110	Man and Culture	2 (2-0-4)
SHHU	112	Group Dynamics and Teamwork	2 (2-0-4)
SHHU	183	Rhetoric for Leadership	2 (2-0-4)
SHSS	130	Principles of Economics	2 (2-0-4)
SHSS	145	Integrated Social Sciences	3 (3-0-6)
SHSS	161	Policy and Planning	2 (2-0-4)
SHSS	181	General Psychology	2 (2-0-4)
SHSS	185	Social Psychology	2 (2-0-4)

Course List

General Education Elective Courses

12 Credits

Elective Languages

2 Credits

EGID	209	English for Engineers	3 (3-0-6)
EGID	490	English Communication for Engineers	3 (3-0-6)
LAFR	141	Elementary French 1	3 (2-2-5)
LAFR	142	Elementary French 2	3 (2-2-5)
LAJP	161	Elementary Japanese 1	3 (2-2-5)
LAJP	162	Elementary Japanese 2	3 (2-2-5)
LACH	171	Chinese 1	3 (2-2-5)
LACH	172	Chinese 2	3 (2-2-5)
LACH	173	Chinese 3	3 (2-2-5)
LAFE	131	Man and Communication Competence	3 (3-0-6)
LAEN	262	Listening and Speaking for Communication	2 (1-2-3)
LAEN	263	Reading and Writing for Communication	2 (1-2-3)
LAEN	271	Writing for Work and Study	3 (3-0-6)
LAEN	338	Effective Presentation in English	2 (1-2-3)

Electives for Math and Science

8 Credits

EGCO	111	Computer Programming	3 (2-2-5)
EGIE	335	Cost Analysis and Budgeting	3 (3-0-6)
SCID	101	Integrated Science	3 (3-0-6)
SCMA	170	Applicable Basic Mathematics and Statistics	2 (2-0-4)
SCGE	280	Enjoying Plant Propagation	2 (2-0-4)
ENGE	100	The Earth and Nature	3 (3-0-6)
ENGE	105	Integrate Health & Environment	3 (3-0-6)

Course List

Electives for Health and Recreation			2 Credits
CFGE	101	Life Design	2 (1-2-3)
SPGE	119	Health for Life	2 (1-2-3)
SPGE	120	Bike for Health and Recreation	2 (1-2-3)
SPGE	129	Lawn Tennis	2 (1-2-3)
SPGE	130	Soccer	2 (1-2-3)
SPGE	132	Basketball	2 (1-2-3)
SPGE	133	Volleyball	2 (1-2-3)
SPGE	141	Swimming for Health and Recreation	2 (1-2-3)
SPGE	142	Aerobic for Health and Recreation	2 (1-2-3)
SPGE	143	Yoga for Health and Recreation	2 (1-2-3)
SPGE	144	Social Dance for Health and Recreation	2 (1-2-3)
SPGE	146	Table Tennis for Health and Recreation	2 (1-2-3)

Math & Basic Sciences			30 Credits
SCMA	115	Calculus	3 (3-0-6)
SCPY	110	Physics Laboratory I	1 (0-3-1)
SCPY	151	General Physics I	3 (3-0-6)
SCCH	115	General Chemistry	3 (3-0-6)
SCCH	118	Chemistry Laboratory	1 (0-3-1)
SCMA	165	Ordinary Differential Equations	3 (3-0-6)
SCPY	152	General Physics II	3 (3-0-6)
SCPY	120	Physics Laboratory II	1 (0-3-1)
EGIE	200	Mathematics for Engineers I	3 (3-0-6)
EGIE	261	Probability and Statistics	3 (3-0-6)
EGME	202	Mathematics for Engineers	3 (3-0-6)
EGME	206	Numerical Methods for Engineers	3 (3-0-6)

Course List

Required Major Courses (73 Credits)

Required Major Courses			73 Credits
EGIE	101	Basic Engineering Practice	2 (1-3-3)
EGME	102	Engineering Drawing	3 (2-3-5)
EGIE	103	Engineering Materials	3 (3-0-6)
EGME	220	Engineering Mechanics	3 (3-0-6)
EGME	213	Mechanics of Materials I	3 (3-0-6)
EGIE	210	Thermofluids for Industrial Engineer	3 (3-0-6)
EGEE	217	Fundamental of Electrical Engineering	3 (3-0-6)
EGEE	218	Fundamental of Electrical Engineering Laboratory	1 (0-3-1)
EGME	371	Mechanical Engineering Laboratory I	1 (0-3-1)
EGME	209	Computer Aided Design and Engineering	2 (1-3-3)
EGIE	204	Manufacturing Processes	3 (3-0-6)
EGIE	205	Manufacturing Processes Laboratory	1 (0-3-1)
EGIE	206	Production Engineering	3 (3-0-6)
EGIE	208	Fundamentals of Design Process for Materials, Tools and Machines	3 (2-3-5)
EGIE	362	Industrial Work Study	3 (2-3-5)
EGIE	364	Industrial Engineering Laboratory	1 (0-3-1)
EGIE	377	Automation and Industrial Robots	3 (2-3-5)
EGIE	378	Maintenance Engineering	3 (3-0-6)
EGIE	333	Engineering Economy	3 (3-0-6)
EGIE	342	Operations Research	3 (3-0-6)
EGIE	363	Quality Control	3 (3-0-6)
EGIE	366	Industrial Plant and Facilities Design	3 (3-0-6)
EGIE	379	Safety Engineering	3 (3-0-6)
EGIE	302	Engineering Training	1 (0-3-1)
EGIE	430	Industrial Management for Engineers	3 (3-0-6)

Course List

Required Major Courses			73 Credits
EGIE	461	Production Planning and Control	3 (3-0-6)
EGIE	470	Quality Assurance	3 (3-0-6)
EGIE	495	Project Topic in Industrial Engineering	1 (0-3-1)
EGIE	496	Industrial Engineering Project	3 (0-9-3)

Elective Major Courses			9 Credits
EGIE	303	Industrial Packaging	3 (3-0-6)
EGIE	304	Machine Design	3 (3-0-6)
EGIE	305	Product and Production Design	3 (3-0-6)
EGIE	307	Introduction to the Internet of Things	3 (2-3-5)
EGIE	321	Engineering Metallurgy	3 (2-3-5)
EGIE	402	Welding Engineering	3 (2-3-5)
EGIE	347	Design and Analysis of Experiments	3 (3-0-6)
EGIE	444	Simulation	3 (3-0-6)
EGIE	350	Productivity Measurement and Management	3 (3-0-6)
EGIE	352	Production Management Information Systems	3 (3-0-6)
EGIE	353	Project Management	3 (3-0-6)
EGIE	446	Introduction to Artificial Intelligence in Engineering	3 (3-0-6)
EGIE	451	Ergonomics	3 (2-3-5)
EGIE	452	Energy and Environmental Management in Industry	3 (3-0-6)
EGIE	460	Logistics and Supply Chain Management	3 (3-0-6)
EGIE	462	Physical Distribution and Warehouse Management	3 (3-0-6)
EGIE	463	Introduction to Railway Engineering	3 (3-0-6)

Free Elective Courses	6 Credits
<p>Students can enroll any courses offered by the IE program, GE courses or any course that is not a compulsory subject as free elective courses under the supervision of the academic advisor at the IE program and the approval of the instructor of that course to register.</p>	

Grading System

Grade	Achievement	Score
A	Excellent	4.0
B+	Very Good	3.5
B	Good	3.0
C+	Fairly Good	2.5
C	Fair	2.0
D+	Poor	1.5
D	Very Poor	1.0
F	Fail	0

Other symbols without scores including meaning are assigned for course work taken as follows:

Symbols	Meaning
AU	Audit
O	Outstanding
S	Satisfactory
T	Transfer of Credit
U	Unsatisfactory
I	Incomplete
P	In progress
X	No report
W	Withdrawal

According to MU Regulation, the grade F and other symbols without numerical equivalence can be described in more details as follows:

The symbol F will be given in the following situations;

1. The student took the examination and failed in the exam or project.
2. The student was absent from the exam without any permission from the faculty committee
or person appointed by the faculty committee.

3. The student was not allowed to take the exam according to MU Regulation (Study time:

The student has to be present in a theoretical, lecture, practice, internship, or field study no less than 80 percent of the total study time of that course in order to be allowed to take the exam).

4. The student violated the examination regulation; for example, being late to the exam, dressed inappropriately according to student uniform regulation or act as in Rule of MU Regulation (Dishonesty Punishments).

5. The student who received an I and did not take the exam or finish the project within one regular semester or trimester after they received the I grade, except that the student has the permission as in Rules of MU Regulation (Leave of Absence).

6. The student who received a P and did not take the exam and/or did not hand in report on time.

7. The student who does not retake the exam or redo the project as indicated in MU Regulation (Symbols with 1.00 or 1.5 points, or the symbol U, means that knowledge or ability of the student is below average. Other grading results are at the discretion of the faculty committee or the person appointed by the committee. On regrading a course, the grade score will be 2.00 (or S), at the maximum.), or the student has retaken the exam or redone the project and is still evaluated as "failed".

8. The student who received an F from a subject and then retake that subject again. The accumulated GPA will not include the "F" from the previous class, the accumulated GPA will include the retake class only. However, the students who received an F, they cannot receive any honors.

The symbol O in each course signifies outstanding knowledge, ability, and skills or knowledge, ability, and skills that are above the normal criteria used for the assessment of each course.

The symbol S or U are given only in non-credit courses or courses with credits for which the faculty has decided to use the non-score grading system.

The symbol AU is given only in the courses in which the student gives his/her intention to study for no credit and the student must participate in classes or practical activities not less than 80 percent of the total study time and practice time period must not be less than 80 percent.

The symbol I will be given in accordance with the following situations;

1. The student did not come to the exam or did not hand in the report in time due to ill health, as evidenced by a medical certificate endorsed by the university's Health Service Unit. However, the final decision will be made by the person appointed by the committee.
2. The student was not allowed to take the exam according to MU Regulation due to ill health, as evidenced by a medical certificate endorsed by the university's Health Service Unit. However, the final decision will be made by the committee.
3. The student was not able to take the exam or hand in the report due to force majeure. However, the final decision will be made by the person appointed by the committee.

The symbol P can be given only in the courses in which the classes are still on going, and/or the courses last longer than one semester/trimester.

The symbol T can be given in the case that the credits for the course have been transferred from another faculty or institute.

The symbol W will be given in the following situations;

1. The student is allowed to withdraw from the courses according to MU Regulation (Course withdrawal can be done after the second week of the regular session or after the first week of the summer session, or after the first week of the courses that do not start at the start of the session, until the week before the exams are held. Courses that are withdrawn will be shown in the transcript and grade report, and the course is counted as registered once.).
2. The student is allowed to take a leave of absence.
3. The student is suspended.

The symbol X can be given only in courses in which the faculty has not yet received the grade report.

Rules of MU Regulation regarding class attendance, load, grades, and appeals are located in the course syllabus to be distributed hand out at the first hour of the class. Students who fail to meet the criteria for good standing a term and cumulative GPA of at least 2.0 are placed on academic warning or probation. Student classification or status for a freshman is classified at the end of the second semester after entry. From sophomore onwards, classification is made at the end of the academic year for the continuing program of study. For students who request to graduate with a diploma or a bachelor's degree, classification may be done at the end of the summer session. A student is classified normal or as under probation according to the following;

- Normal status applies to students who are registered in the very first session or students who have CUM GPA of at least 2.00.
- Probation status applies to students who have CUM GPA greater than or equal to 1.50 but less than 2.00, which can be further classified into 2 types.
 - Type 1 means a group of students who have CUM GPA of 1.50 or higher but less than 1.80.
 - Type 2 means a group of students who have CUM GPA of 1.80 or higher but less than 2.00.

Graduation Requirements

In order to graduate from the industrial engineering program, Mahidol University, a graduating student has to fulfill all of the following requirements listed below in order to be awarded the degree of Bachelor of Engineering in Industrial Engineering:

- Pass the English language proficiency assessment criteria announced by Mahidol University;
- Pass the senior (capstone) project course;
- Pass the Engineering training course (minimum of 240 hours of Engineering Training in the industrial sector);
- Obtain minimum cumulative credits of Industrial Engineering (including the senior project and engineering training);
- Achieved minimum CUM GPA of 2.00;
- Completed and passed all courses and any requirements set forth in the curriculum of the Industrial Engineering degree program as follows:

General Education Course			30 Credits
MUGE	101	General Education for Human Development	2 (1-2-3)
MUGE	102	Social Studies for Human Development	3 (2-2-5)
MUGE	103	Arts and Science for Human Development	2 (1-2-3)
LAEN	103 / 105	English Level 1 / 3	3 (2-2-5)
LAEN	104 / 106	English Level 2 / 4	3 (2-2-5)
EGCO	111	Computer Programming	3 (2-2-5)
LATH	100	Art of Using Thai Language in Communication	3 (2-2-5)
EGID	300	Philosophy, Ethics and Laws for Engineers	1 (1-0-2)
x	x	General Education Elective (Human)	3 (x-x-x)
x	x	General Education Elective (languages)	3 (x-x-x)
x	x	General Education Elective (Physical Education / Music)	1 (x-x-x)

Graduation Requirements

Math & Basic Sciences			30 Credits
SCMA	115	Calculus	3 (3-0-6)
SCPY	110	Physics Laboratory I	1 (0-3-1)
SCPY	151	General Physics I	3 (3-0-6)
SCCH	115	General Chemistry	3 (3-0-6)
SCCH	118	Chemistry Laboratory	1 (0-3-1)
SCMA	165	Ordinary Differential Equations	3 (3-0-6)
SCPY	152	General Physics II	3 (3-0-6)
SCPY	120	Physics Laboratory II	1 (0-3-1)
EGIE	200	Mathematics for Engineers I	3 (3-0-6)
EGIE	261	Probability and Statistics	3 (3-0-6)
EGME	202	Mathematics for Engineers	3 (3-0-6)
EGME	206	Numerical Methods for Engineers	3 (3-0-6)

Required Major Courses			73 Credits
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EGIE	210	Thermofluids for Industrial Engineer	3 (3-0-6)
EGEE	217	Fundamental of Electrical Engineering	3 (3-0-6)
EGEE	218	Fundamental of Electrical Engineering Laboratory	1 (0-3-1)
EGME	371	Mechanical Engineering Laboratory I	1 (0-3-1)
EGME	209	Computer Aided Design and Engineering	2 (1-3-3)
EGIE	204	Manufacturing Processes	3 (3-0-6)
EGIE	205	Manufacturing Processes Laboratory	1 (0-3-1)
EGIE	206	Production Engineering	3 (3-0-6)

Graduation Requirements

Required Major Courses			73 Credits
EGIE	208	Fundamentals of Design Process for Materials, Tools and Machines	3 (2-3-5)
EGIE	362	Industrial Work Study	3 (2-3-5)
EGIE	364	Industrial Engineering Laboratory	1 (0-3-1)
EGIE	377	Automation and Industrial Robots	3 (2-3-5)
EGIE	378	Maintenance Engineering	3 (3-0-6)
EGIE	333	Engineering Economy	3 (3-0-6)
EGIE	342	Operations Research	3 (3-0-6)
EGIE	363	Quality Control	3 (3-0-6)
EGIE	366	Industrial Plant and Facilities Design	3 (3-0-6)
EGIE	379	Safety Engineering	3 (3-0-6)
EGIE	302	Engineering Training	1 (0-3-1)
EGIE	430	Industrial Management for Engineers	3 (3-0-6)
EGIE	461	Production Planning and Control	3 (3-0-6)
EGIE	470	Quality Assurance	3 (3-0-6)
EGIE	495	Project Topic in Industrial Engineering	1 (0-3-1)
EGIE	496	Industrial Engineering Project	3 (0-9-3)

Elective Major Courses			9 Credits
x	x	Industrial Engineering Elective	3 (x-x-x)
x	x	Industrial Engineering Elective	3 (x-x-x)
x	x	Industrial Engineering Elective	3 (x-x-x)

Free Elective Courses			6 Credits
x	x	Free Elective	3 (x-x-x)
x	x	Free Elective	3 (x-x-x)

Total			148 Credits
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Honors and Awards

A student who has studied in an undergraduate engineering program is eligible to receive a degree with honors. However, transferred courses require at least Grade B (or equivalent) and are not used to calculate the CUM GPA. In order to receive First Class honors, the student must have a CUM GPA of 3.50 or above, while a Second-Class honors student must have a CUM GPA of 3.25 or above, also a student must;

- Not used time that exceeds that which is indicated in the curriculum.
 - Never have regraded or registered in other courses or retaken an exam or redone a report or project in any course in the curriculum including the transferred courses.
 - If the student has transferred some credits, the sum of the transferred credits should not exceed one quarter of the total number of credits in the curriculum.
-