Industrial, Manufacturing and Systems Engineering - Undergraduate Program

NOTE: PLEASE SEE THE MID-YEAR CATALOG ADDENDUM (https://catalog.uta.edu/midyearaddendum/) FOR INFORMATION ABOUT *accreditation statement.*

Overview

Industrial Engineering students will be prepared for engineering practice through a curriculum culminating major engineering design experience that 1) incorporates appropriate engineering standards and multiple constraints, and 2) is based on the knowledge and skills acquired in earlier course work.. The curriculum will prepare graduates to design, develop, implement, and improve integrated systems that include people, materials, information, equipment and energy. The curriculum includes in-depth instruction to accomplish the integration of systems using appropriate analytical, computational, and experimental practices.

Program Educational Objectives

Industrial engineers analyze, design, and transform complex systems of people, processes, and technology to accomplish organizational goals. To this end, the program educational objectives of the Industrial Engineering program are what we expect our students to attain within three to five years of graduation as follows.

- To create value for stakeholders through the identification, development, and implementation of new or optimized processes, products, or integrated systems.
- To successfully communicate and document process descriptions, methodologies, data, analyses, results, and proposals to stakeholders.
- To achieve goals through effective team interactions, followership, and leadership.
- To maintain basic knowledge and skills and to evolve capabilities through professional development and advanced education.
- To maintain connection with the University and the professional community.

The following student outcomes prepare graduates to attain the program educational objectives:

a. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
b. 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
c. an ability to communicate effectively with a range of audiences
d. 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
e. 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
f. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
g. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Students will be prepared for engineering practice through a curriculum culminating in a major design experience based on the knowledge and skills in earlier course work and incorporating appropriate engineering standards and multiple realistic constraints. The curriculum will prepare graduates to design, develop, implement, and improve integrated systems that include people, materials, information, equipment and energy. The curriculum includes in-depth instruction to accomplish the integration of systems using appropriate analytical, computational, and experimental practices.

ABET Accreditation

Accreditation is an assurance that the professionals that serve us have a solid educational foundation and are capable of leading the way in innovation, emerging technologies, and in anticipating the welfare and safety needs of the public. The program in Industrial Engineering has been accredited since 1967 by the Engineering Accreditation Commission (EAC) of ABET, http://www.abet.org (http://www.abet.org/), under the General Criteria and the Industrial Engineering Program Criteria.

Academic Regulations

ADMISSION TO INDUSTRIAL ENGINEERING PROGRAM

For admission to the industrial engineering program, all students must meet the requirements for admission to the College of Engineering. A grade point average of 2.25 in science, mathematics, and engineering courses is required for unconditional transfer into the department.

ADVANCEMENT INTO INDUSTRIAL ENGINEERING PROFESSIONAL PROGRAM

Requirements for advancement into the Professional Program in Industrial Engineering are in accordance with those in the College of Engineering with the added stipulations that:

- Application to the Professional Program is to be made to the Undergraduate Advisor during the semester following completion of the last pre-professional course.
- No professional Industrial Engineering course may be taken unless the student is admitted into the professional program or obtains the consent of the Undergraduate Advisor. Professional courses may be taken to fill out a schedule in the semester that the last pre-professional course is taken.
- Each student must complete all pre-professional courses stipulated under "Requirements for a Bachelor of Science Degree in Industrial Engineering" with a minimum grade of C in each course and a minimum GPA of 2.25 in each of three categories: (1) overall, (2) required math, science, and engineering courses, and (3) required IE courses.

Most professional Industrial Engineering courses are offered only once a year. Students are urged to plan their course sequence schedules carefully to avoid delaying their graduation

PROFESSIONAL COURSE GRADE REQUIREMENT

All professional courses, which are pre-requisites for other courses, must be completed with a minimum grade of C in each course.

ADVISING

The advising process is designed to assist students as they make important decisions related to their academic progress at UTA and career goals in general.

Specifically, the purpose of advising is:

- To empower students to clarify and achieve their educational goals by providing timely and accurate information about degree requirements, as well as College and University policies and procedures.
- To provide every student with the opportunity to develop a relationship with a knowledgeable advisor in order to obtain sound academic advising with a degree of continuity.
- To provide students with information about additional services, programs, and support systems available within the College and University as appropriate.

Ultimately, the student is responsible for seeking academic advice, making decisions regarding goals, meeting degree requirements, and enrolling in appropriate courses. The academic advisor is to provide assistance in these decisions. Each student is responsible for understanding and complying with University and College practices and procedures.

During each long semester, the Industrial and Manufacturing Systems Engineering Department conducts pre-enrollment advising weeks. All students must receive this pre-enrollment advising prior to registering for classes.

ORAL COMMUNICATION AND COMPUTER USE COMPETENCY REQUIREMENTS

Students majoring in Industrial Engineering may use COMS 2302, to demonstrate oral communication competency. Students majoring in Industrial Engineering are required to take IE 1205 INTRODUCTION TO INDUSTRIAL ENGINEERING AND COMPUTING . A computer competency examination will be administered in IE 1205 INTRODUCTION TO INDUSTRIAL ENGINEERING AND COMPUTING. For transfer students and others who do not take IE 1205 INTRODUCTION TO INDUSTRIAL ENGINEERING AND COMPUTING, the computer literacy test will be administered by the University.

ACADEMIC HONESTY

The College of Engineering takes academic honesty and ethical behavior very seriously. Engineers are entrusted with the safety, health, and well being of the public. Students found guilty of academic dishonesty will be punished to the full extent permitted by the rules and regulations of UT Arlington. In particular, any student found guilty of a second offense by the Office of Student Judicial Affairs will be subject to dismissal from the College of Engineering.

Other Provisions

Refer to the College of Engineering section of this catalog for information concerning the following topics: Preparation in High School for Admission to the College of Engineering, Admission to the College of Engineering, Admission to the Professional Program, Counseling, College of Engineering Academic Regulations, Transfer Policies, College of Engineering Probation, Repeating Course Policy, Academic Honesty, and Modern and Classical Languages Requirement.

Requirements for a Bachelor of Science Degree in Industrial Engineering

General Education Courses

| POLS 2311 | GOVERNMENT OF THE UNITED STATES | 3 |

POLS 2312	STATE AND LOCAL GOVERNMENT	3
COMS 2302	PROFESSIONAL AND TECHNICAL COMMUNICATION FOR SCIENCE AND ENGINEERING	3
Language, Philosophy, or Culture Elective		3
Creative Arts Elective		3
History Electives		6
Pre-Professional Courses [1]		
UNIV 1131	STUDENT SUCCESS	1
or ENGR 1101	ENTRANCE TO ENGINEERING FOR TRANSFER STUDENTS	
ENGL 1301	RHETORIC AND COMPOSITION I	3
MATH 1426	CALCULUS I [2]	4
MATH 2425	CALCULUS II	4
MATH 2326	CALCULUS III	3
MATH 3319	DIFFERENTIAL EQUATIONS & LINEAR ALGEBRA	3
PHYS 1443	GENERAL TECHNICAL PHYSICS I	4
PHYS 1444	GENERAL TECHNICAL PHYSICS II	4
CHEM 1441 & CHEM 1442	GENERAL CHEMISTRY I and GENERAL CHEMISTRY II	8
Or:		
CHEM 1465	CHEMISTRY FOR ENGINEERS (& Approved Science Elective)	
MAE 1351	INTRODUCTION TO ENGINEERING DESIGN	3
IE 1110	FIRST SEMESTER INDUSTRIAL ENGINEERING SEMINAR	1
IE 1325	INTRODUCTION TO DATA ANALYSIS	3
IE 2305	COMPUTER APPLICATIONS IN INDUSTRIAL ENGINEERING (or approved alternative)	3
IE 2308	ECONOMICS FOR ENGINEERS	3
IE 3301	ENGINEERING PROBABILITY	3
IE 3315	OPERATIONS RESEARCH I	3
Professional Courses		
IE 3314	ENGINEERING RESEARCH METHODS	3
IE 3343	METRICS AND MEASUREMENT	3
IE 4303	PRODUCTION AND INVENTORY CONTROL	3
IE 4305	ENGINEERING DECISION MAKING WITH DATA USING PYTHON	3
IE 4308	QUALITY SYSTEMS	3
IE 4315	OPERATIONS RESEARCH II	3
IE 4318	ENTERPRISE DESIGN	3
IE 4322	ENTERPRISE SIMULATION	3
IE 4325	AUTOMATION AND ROBOTICS I	3
IE 4339	MANUFACTURING PROCESS & SYSTEM ANALYSIS	3
IE 4340	ENGINEERING PROJECT MANAGEMENT	3
IE 4343	FACILITIES PLANNING AND DESIGN	3
IE 4344	HUMAN FACTORS ENGINEERING	3
IE 4345	DECISION ANALYSIS IN SYSTEM DESIGN	3
IE 4350	INDUSTRIAL ENGINEERING CAPSTONE DESIGN	3
Technical Electives		9
Total Hours		**128**

[1]   All pre-professional courses must be completed before enrolling in professional courses.

[2]   Placement in MATH 1426 is based on UT Arlington math placement scores.

Note: Total hours will depend upon prior preparation and academic qualifications. Also, students who do not have two units of high school foreign language will be required to take modern and classical languages courses in addition to the previously listed requirements.

The Industrial and Manufacturing Systems Engineering Department conducts academic advising each semester. Each student must make an appointment to meet with the undergraduate advisor.

Recommended Core Curriculum

Industrial Engineering students will satisfy the university core curriculum requirement by completing all General Education courses specified under "Requirements for a Bachelor of Science Degree in Industrial Engineering" along with ENGL 1301, MATH 1426, MATH 2425, MATH 2326, PHYS 1443, PHYS 1444, and IE 2308, which are within the Pre-Professional Program. The university core curriculum allows each degree plan to designate a component area to satisfy three hours of the core requirement. For the industrial engineering degree plan, the designated component area is Mathematics and MATH 2326 and is selected to satisfy the requirement. For more information, see https://nextcatalog.uta.edu/degreerequirements/generalcorerequirements/.

Suggested Course Sequence

For a suggested course sequence see the departmental website.

Requirements for a Minor in Industrial Engineering

To receive a minor in Industrial Engineering, a student must complete the following courses with a grade of C or better in:

IE 2308	ECONOMICS FOR ENGINEERS	3
IE 3301	ENGINEERING PROBABILITY	3
IE 3315	OPERATIONS RESEARCH I	3
Three upper division IE courses for which the prerequisites are satisfied		9
Total Hours		**18**

Certificate in Unmanned Vehicle Systems

Program Objective

The Certificate in UVS (Unmanned Vehicle Systems) is offered through the Industrial, Manufacturing, and Systems Engineering Department and will educate undergraduate students in the knowledge and skills required for design, development and operation of UVS including UAS (Unmanned Aircraft Systems), UGS (Unmanned Ground Systems), and UMS (Unmanned Maritime Systems). The certificate program will emphasize the common aspects of UVS such as sensors, actuators, communications, and more importantly, decision-making capabilities (autonomy). This program aims at the dual goal of providing the UVS industry with a knowledgeable, locally available workforce and developing career opportunities for its participants. To this end, the IMSE Certificate in UVS will be awarded concurrently with a BSIE undergraduate degree.

Admission Requirements

The certificate is open to all degree-seeking students. Students should see the undergraduate advisor for the Industrial, Manufacturing, and Systems Engineering Department for admission to the program.

Academic Requirements

Students must complete 15 hours of coursework as outlined below that include 6 hours of a core curriculum that is interdisciplinary and forms the basis of a common core in UVS Certificate and 9 hours of discipline specific curriculum. A combined GPA of 3.0 or better must be earned on all courses used to satisfy the certificate requirements.

Required classes		**6**
IE 4378	INTRODUCTION TO UNMANNED VEHICLES SYSTEMS	
IE 4379	UNMANNED VEHICLE SYSTEM DEVELOPMENT	
9 credit hours from the following list		**9**
IE 2305	COMPUTER APPLICATIONS IN INDUSTRIAL ENGINEERING	
IE 3314	ENGINEERING RESEARCH METHODS	
IE 4325	AUTOMATION AND ROBOTICS I	
One 3 hour alternate UVS related course may be substituted based on consultation with the undergraduate curriculum advisor in the program.		

Fast Track Program for a Master's Degree in Industrial Engineering

The Fast Track Program enables outstanding UT Arlington senior undergraduate students in Industrial Engineering to satisfy degree requirements leading to a master's degree in Industrial Engineering while completing their undergraduate studies. When senior-level students are within 15 hours of completing their undergraduate degree requirements, they may take up to six hours of coursework designated by the Industrial Engineering Program to satisfy both undergraduate and graduate degree requirements. In the limiting case, a student completing the maximum allowable hours (6) while in undergraduate status would have to take only 24 additional hours to meet minimum requirements for graduation.

Interested UT Arlington undergraduate Industrial Engineering students should apply to the Industrial Engineering Program when they are within 30 hours of completing their bachelor's degrees. They must have completed at least 30 hours at UT Arlington, achieving an overall GPA of 3.0 or better in all work done at UT Arlington and in the last 30 hours. Additionally, they must have completed nine hours of specified foundation courses with a minimum GPA of 3.3 in those courses. Contact the Undergraduate Advisor or Graduate Advisor in Industrial Engineering for more information about the program.

BS to PhD Program

The BS to PhD track in Industrial Engineering requires 30 credit hours including 18 hours of diagnostic coursework, a three credit hour elective and nine credit hours of research coursework. This is in addition to the PhD requirements.