BACHELOR OF SCIENCE IN INDUSTRIAL ENGINEERING - ECONOMIC AND FINANCIAL SYSTEMS

The principal strength of the academic program leading to the Bachelor of Science in Industrial Engineering (BS IE) is its blend of mathematics, physical sciences and business applications. The methodology foundation is built on probability, optimization, statistics, computing, and economics. The program features a unique concentration system that allows students to get a broad industrial engineering education and to specialize in areas such as:

- Economic and Financial Systems (p. 1),
- Operations Research (http://www.catalog.gatech.edu/programs/industrial-engineering-operations-research-bs),
- Quality and Statistics (http://www.catalog.gatech.edu/programs/industrial-engineering-quality-statistics-bs),
- Supply Chain Engineering (http://www.catalog.gatech.edu/programs/industrial-engineering-supply-chain-engineering-bs), and
- General Industrial Engineering (http://www.catalog.gatech.edu/programs/industrial-engineering-general-bs).

This blend produces the flexibility that is inherent in the field of industrial and systems engineering, and that affords BSIE graduates a wide array of career options. Our graduates are constantly looking for ways to make anything in life work better, more efficiently and more productively.

Program Educational Objectives

The Stewart School of Industrial & Systems Engineering expects our graduates (in 3 to 6 years):

- to become successful Industrial Engineers;
- to take leadership in their endeavors;
- to be self-learners and starters;
- to succeed in professional and educational advancement.

Wellness

APPH 1040 Scientific Foundations of Health 2
or APPH 10 The Science of Physical Activity and Health

Core A - Essential Skills

ENGL 1101 English Composition I 3
ENGL 1102 English Composition II 3
MATH 1552 Integral Calculus 4

Core B - Institutional Options

CS 1301 Introduction to Computing 3

Core C - Humanities

Any HUM (http://www.catalog.gatech.edu/academics/undergraduate/core-curriculum/core-area-c) 6

Core D - Science, Math, & Technology

PHYS 2211 Introductory Physics I 4
PHYS 2212 Introductory Physics II 4
MATH 1551 Differential Calculus 2
MATH 1553 Introduction to Linear Algebra 2

Core E - Social Sciences

Select one of the following: 3
HIST 2111 The United States to 1877
HIST 2112 The United States since 1877
INTA 1200 American Government in Comparative Perspective
POL 1101 Government of the United States
PUBP 3000 American Constitutional Issues
ECON 2100 Economic Analysis and Policy Problems 3
PSYC 1101 General Psychology 3
Any SS (http://www.catalog.gatech.edu/academics/undergraduate/core-curriculum/core-area-e) 3

Core F - Courses Related to Major

CS 2316 Data Manipulation for Science and Industry 3
CS 4400 Introduction to Database Systems 3
MATH 2551 Multivariable Calculus 4
Lab Science 8

Ethics Requirement (http://www.catalog.gatech.edu/academics/undergraduate/core-curriculum/ethics) 7
Environmental Requirement 9

Major Requirements

ACCT 2101 Accounting I: Financial Accounting 3
or MGT 3000 Accounting for Decision Making
MATH 2603 Introduction to Discrete Mathematics 4
ISYE 2027 Probability with Applications 3
ISYE 2028 Basic Statistical Methods 3
ISYE 3025 Essentials of Engineering Economy 1
ISYE 3133 Engineering Optimization 3
ISYE 3232 Probabilistic Operations Research 3
ISYE 3044 Simulation Analysis and Design 3
ISYE 4106 Senior Design 4

Engineering Electives 12
Select one of the following: 3
ECE 2020 Digital System Design
ECE 2026 Introduction to Signal Processing
ECE 3710 Circuits and Electronics
& ECE 3741 and Instrumentation and Electronics Lab

Select 6 credits from Group 1 and Group 2: 8,11 6

Group 1:

AE 2020 Low-Speed Aerodynamics
AE 2220 Dynamics
AE 3450 Thermodynamics and Compressible Flow
BMED 2210 Conservation Principles in Biomedical Engineering
BMED 3100 Systems Physiology
CHBE 2100 Chemical Process Principles
CHBE 2110 Chemical Engineering Thermodynamics I
CHBE 4763 Pulping and Chemical Recovery
CHBE 4764 Bleaching and Papermaking
COE 2001 Statics
COE 3001 Mechanics of Deformable Bodies
CEE 2040 Dynamics
CEE 2300 Environmental Engineering Principles
Bachelor of Science in Industrial Engineering - Economic and Financial Systems

CEE 3010 Geomatics
CEE 4100 Construction Engineering and Management
CEE 4300 Environmental Engineering Systems
CEE 4600 Transportation Planning, Operations, and Design
CS 2110 Computer Organization and Programming
CS 4641 Machine Learning
CX 4010 Computational Problem Solving for Scientists and Engineers
CX 4240 Introduction to Computing for Data Analysis
CX 4242 Data and Visual Analytics
ECE 2020 Digital System Design
ECE 2026 Introduction to Signal Processing
ECE 2040 Circuit Analysis
ECE 3035 Mechanisms for Computing Systems
ECE 3076 Computer Communications
ECE 4606 Software Fundamentals for Engineering Systems
ECE 4741 Instrumentation and Electronics Lab
ECE 4606 Wireless Communications
ME 2202 Dynamics of Rigid Bodies
ME 3015 System Dynamics and Control
ME 3322 Thermodynamics, Thermodynamics I
ME 3720 Introduction to Fluid and Thermal Engineering
ME 4763 Pulping and Chemical Recovery
ME 4764 Bleaching and Papermaking
MSE 2001 Principles and Applications of Engineering Materials
MSE 3012 Thermal and Transport Properties of Materials
MSE 3015 Electrical, Optical and Magnetic Properties
NRE 3301 Radiation Physics

Group 2:
AE 3310 Introduction to Aerospace Vehicle Performance
AE 4370 Life Cycle Cost Analysis
AE 4701 Wind Engineering
AE 4793 Composite Materials and Processes
ARCH 6271 Healthcare Design of the Future
BIOL 2400 Mathematical Models in Biology
BIOL 4740 Biologically Inspired Design
BIOL 4755 Mathematical Biology
BMED 2300 Problems in Biomedical Engineering II
BMED 3400 Introduction to Biomechanics
BMED 4751 Introduction to Biomaterials
CHBE 4793 Composite Materials and Processes
COE 3002 Intro to Microelectronics and Nanotechnology Revolution
CEE 4225 Introduction to Coastal Engineering
CEE 4330 Air Pollution Engineering
CEE 4793 Composite Materials and Processes
CP 4310 Urban Transportation and Planning
CP 4510 Fundamentals of Geographic Information Systems
ECE 2031 Digital Design Laboratory
ECE 2040 Circuit Analysis
ECE 4755 Electronic Packaging Substrate Fabrication
ISYE 4740 Bio-Inspired Design
MATH 4755 Mathematical Biology
ME 2110 Creative Decisions and Design
ME 3057 Experimental Methodology and Technical Writing
ME 4740 Biologically Inspired Design
ME 4793 Composite Materials and Processes
MSE 2021 Materials Characterization
MSE 3720 Introduction to Polymer/Fiber Enterprise
MSE 4751 Introduction to Biomaterials
MSE 4755 Electronic Packaging Substrate Fabrication
MSE 4793 Composite Materials and Processing

Economic and Financial Systems Concentration

ISYE 4301 Supply Chain Economics 3
ISYE 4311 Capital Investment Analysis 3
Select one of the following: 3
ECON 3150 Economic and Financial Modeling
ECON 4340 Economics of Industrial Competition
ECON 4350 International Economics
MGT 3078 Finance and Investments
Select three of the following: 9
ISYE 3039 Methods of Quality Improvement
ISYE 3103 Introduction to Supply Chain Modeling: Logistics
ISYE 3104 Introduction to Supply Chain Modeling: Manufacturing and Warehousing
ISYE 4031 Regression and Forecasting
ISYE 4111 Advanced Supply Chain Logistics
ISYE 4133 Advanced Optimization
ISYE 4232 Advanced Stochastic Systems
ISYE 4803 Special Topics 4
Free Electives 4
Free Electives 11
Total Credit Hours 128

Pass-fail only allowed for Free Electives, Humanities, and the Social Sciences elective.

ISYE titled courses, excluding free electives, must have cumulative GPA of 2.0 or higher.

1 Only one EAS course can be used toward ISYE Lab Science requirements.
2 Minimum grade of C required for all Math courses in the BSIE curriculum.
3 PSYC 1101 will satisfy the Ethics requirement.
4 ISYE 4803 must be titled "Adv Manufacturing" or "Adv Simulation" or "Facility Layout and Warehousing" or "Supply Chain Design Project" or "Business Analytics" or "Linear and Convex Optimization"
5 MATH 1113, MGT 2250, ISYE 3770, and PHYS 2XXX (AP credit) not allowed.

6 These 3 courses must be from at least 2 of the following groups:
   • Supply Chain Engineering (ISYE 3103 or ISYE 3104 or ISYE 4111 or ISYE 4803 "Adv Manufacturing")
   • Quality & Statistics (ISYE 3039 or ISYE 4031 or CS 4641)
   • Operations Research (ISYE 4133 or ISYE 4232 or ISYE 4803 "Adv Simulation")

7 Students should choose from the following for Environmental Requirement: BIOL 1510, BIOL 2335, CEE 2300, CEE 4300, EAS 1600, EAS 1601, EAS 2600, EAS 2750, EAS 3110, EAS 4480, ECON 4440, ISYE 4803 (with title "Energy and Environmental Analysis") or PHYS 2750

8 Only one CX course allowed unless given approval from ISyE Associate Chair.

9 Students must complete 6 concentration courses: 3 depth courses and 3 breadth courses. A minimum of 5 of the 6 required concentration courses must be ISYE courses.

10 Students may also complete MATH 1554 and MATH 2550 to satisfy Math requirements. If MATH 1554/MATH 2550 combination is taken, then two hours from MATH 1554 may be used in Area F to give Area F 18 hours.

11 Students must take at least 9 credits of engineering electives. Three credits must be chosen from ECE 2020, ECE 2026, or ECE 3710/ECE 3741. For the remaining 6 credits, at least 2 credits must be from Group 1.

12 Students must complete courses from two different eligible engineering elective subjects.

Cooperative Plan

The Co-op Program enhances the student's education, employability and earnings potential. For more details, visit co-op pages from Georgia Tech's co-op Website (http://www.coop.gatech.edu).

• Co-op courses are designated in the schedule of classes as co-op. All students interested in registering for this course(s) must have been accepted into the co-op Program. Students must have met with their co-op advisor to be issued a permit to register for restricted course(s). Students must register for the co-op course every semester they are at work in order to receive credit for the work term.

• Students who are in the Co-op Program (U.S. citizens and Permanent Residents) and are returning to work should automatically receive a permit but are advised to remain in close contact with their co-op advisor.

• International students must receive work authorization from the Office of International Education prior to each work term before a course registration permit will be issued.

• Neither co-op nor internship courses count for credit towards the industrial engineering degree; however, successful completion of the Co-op Program leads to a degree designator.

For more information about all of the programs in the Center for Career Discovery and Development, visit Career Discovery and Development (http://www.careerdiscovery.gatech.edu).

International Plan

The Georgia Tech International Plan is designed to prepare graduates to develop significant global competence. Many Industrial Engineers work in consulting companies, supply chain, economic decision systems, etc. Global perspectives are very important. The significant global competence will give them an additional advantage on the job market and on the jobs.

The major components of International Plan include

1. Twenty six weeks of international experience (work, research or study)

2. Foreign language requirements. This can be satisfied by oral proficiency measured tested by an exam by the American Council for the Teaching of Foreign Languages (ACTFL). The foreign language requirement can also be satisfied by course work. It means the passing of two 2XXX level language classes.

3. Three internationally oriented courses plus an addendum in the capstone design on international perspective.

For more details of the International Plan, including application materials, visit the Office of International Education (http://www.internationalplan.gatech.edu). Please also see The International Plan Option in ISyE (http://www.isye.gatech.edu/academics/undergraduate/international/isyeintplan.pdf).

BS/MS Program

A combined BS/MS program that will allow students to graduate with a Bachelor of Science in Industrial Engineering and a Master of Science in Supply Chain Engineering. Contact the School of Industrial Engineering for more information.