

INDUSTRIAL ENGINEERING TECHNOLOGY (IENG), BACHELOR OF SCIENCE

At Dunwoody College of Technology, the Industrial Engineering Technology program provides a bachelor's completion degree option with the skills and theoretical knowledge needed to advance graduates into engineering and management positions in their respective industries.

Graduates from this program will be prepared to take on new roles such as: industrial engineer, manufacturing engineer, quality engineer, and process engineer.

Students learn how to apply engineering principles to the work environment; how to work collaboratively in a team environment; and how to use tools and data to anticipate and solve issues in the engineering process. Coursework includes study in manufacturing processes and industrial automation, work methods and design, quality and lean, management, and ethics and social responsibility.

Curriculum is project-based so that theoretical engineering principles are reinforced and experienced through hands-on creation and problem-solving.

Arts & Sciences courses help students understand the core mathematical and scientific principles that are the foundation of engineering theory and provide students with the communication and critical thinking skills required to succeed in the profession.

The program also incorporates a senior capstone project in its final semester that gives students the chance to demonstrate real-world industrial engineering experience.

Accredited by the Engineering Technology Accreditation Commission of ABET, <https://www.abet.org> (<https://www.abet.org/>), under the general criteria and the Industrial Engineering Technology program criteria.

Credential Earned: BS

Length of Program: 2 years (4 semesters)

Classes Offered: Evening

Available Starts: Fall Semester; Spring Semester

Accreditation: Accredited by the Engineering Technology Accreditation Commission of ABET, <https://www.abet.org>, under the general criteria and the Industrial Engineering Technology program criteria.

Program Outcomes

- ETAC 1: An ability to apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve broadly-defined engineering problems appropriate to the discipline.
- ETAC 2: An ability to design systems, components, or processes meeting specified needs for broadly-defined engineering problems appropriate to the discipline.
- ETAC 3: An ability to apply written, oral, and graphical communication in broadly-defined technical and non-technical environments; and an ability to identify and use appropriate technical literature.

- ETAC 4: An ability to conduct standard tests, measurements, and experiments and to analyze and interpret the results to improve processes.
- ETAC 5: An ability to function effectively as a member, as well as a leader, on technical teams.

Degree Requirements

Admitted students to Industrial Engineering Technology (IENG) can transfer up to 40 technical credits, 15 General Education elective credits, and 3 Social Science credits. A transfer evaluation is required. Not all credits may transfer into the degree program.

Code	Title	Credits
Transfer Credits		40
General Requirements		
COMM4100	Technical Writing Capstone	3
HUMN2900	Ethics of Artificial Intelligence	3
MATH1700	Pre Calculus	3
MATH1810	Calculus I	3
MATH1820	Calculus II	3
MATH2250	Statistics	3
PHYS1800	Physics I with Lab	4
Social Sciences Elective		3
General Education Electives		15
Technical Requirements		
ENGR1110	Introduction to Engineering	3
IENG3150	Manufacturing Processes I with Lab	3
ENGR1210	Introduction to Programming	3
IENG3160	Quality & Lean Systems	3
IENG3115	Statistical Quality Control	2
AENT4130	Machine Safety & Risk Assessment	2
IENG4111	Ergonomics & Work Measurement	3
ENGR3110	Project Management	3
ENGR3120	Engineering Economics	2
IENG4116	Supply Chain Management	3
IENG4126	Production Planning	3
IENG4295	Senior Capstone	4
Upper Division IENG Electives		6
Total Credits		120

Courses

Descriptions

ENGR1110 | Introduction to Engineering | Lecture (3 Credits)

Explore major topics in Engineering. Provides a pathway to success in the School of Engineering programs, including time management, industry software, study skills, teamwork skills, internship availability and career opportunities.

IENG3150 | Manufacturing Processes I with Lab | Lecture/Laboratory (3 Credits)

Examine and apply various manufacturing processes and materials used in product development and manufacturing. Each process is covered from a technical perspective, with an emphasis placed on how multiple processes can be linked together. Several manufacturing processes, such as computer aided design, machining, welding, and electronics are used to design a product.

ENGR1210 | Introduction to Programming | Lecture/Laboratory (3 Credits)

Examine and implement computational problem-solving strategies using computer languages to solve engineering problems. Develop algorithms and translate solutions into computer programs. Distinguish differences in programming languages and software tools with applicability to different types of problem solutions. Apply modular design and clear documentation for efficient problem solving.

IENG3160 | Quality & Lean Systems | Lecture/Laboratory (3 Credits)

Investigate the history and evolution of lean systems and current day applications to manufacturing, service, and business. Apply fundamental lean philosophies and tools to manufacturing, service, and business. Explore the role of culture transformation and change management techniques in the application of lean tools, total quality management, and international standards.

IENG3115 | Statistical Quality Control | Lecture (2 Credits)

Apply statistical methods to study the quality of products and services, determining how to reduce the time required to produce the product and ensure the quality of the product. Topics include probability and statistics, control charts, acceptance criteria and sampling, and case studies.

Prerequisite(s): MATH2250

AENT4130 | Machine Safety & Risk Assessment | Lecture (2 Credits)

Examine OSHA machine guarding requirements as they pertain to hazard prevention.

IENG4111 | Ergonomics & Work Measurement | Lecture (3 Credits)

Introduction to ergonomics as applied to the human-machine interface, as well as the fundamental concepts behind work design, with emphasis on measuring work and analyzing work methods. Topics include methods engineering and analysis, time and motion studies, and workplace design considering physical and cognitive ergonomic principles.

ENGR3110 | Project Management | Lecture/Laboratory (3 Credits)

Examine the methods and tools used for effective management of engineering projects. Topics include the analytical methods used to budget, schedule, and control projects, as well as risk management, team leadership, and communication.

ENGR3120 | Engineering Economics | Lecture (2 Credits)

Economic analysis of engineering decisions under uncertainty. Concepts include time value of money, cash flow estimation, rate of return analysis, net present value estimation, and asset evaluation. Applications include comparing different project alternatives accounting for heterogeneity in cost, revenue, taxation, depreciation, inflation, and risk.

IENG4116 | Supply Chain Management | Lecture (3 Credits)

Explain the fundamentals of supply chain management. Topics include the supply chain network, system integration, supply chain strategies, challenges in managing the supply chain, and strategy alignment.

IENG4126 | Production Planning | Lecture (3 Credits)

Utilize aspects of management to maximize productivity in a factory or service environment. Topics include sales & operations planning, inventory and capacity management, material requirements planning, and the theory of constraints.

IENG4295 | Senior Capstone | Practicum (4 Credits)

Demonstrate overall content knowledge of the program outcomes through a major project. Conduct a final presentation of the project and explain how it applies to the engineering program outcomes.

Prerequisite(s): WRIT4020

IENG4211 | Simulation Modeling | Lecture (3 Credits)

Utilize simulation to create, analyze, and evaluate realistic models of real-world environments. Topics include Monte Carlo simulation, queuing theory, selecting input distributions, animation in simulation, and evaluating simulation output.

IENG4250 | Industrial Automation with Lab | Lecture/Laboratory (3 Credits)

Investigate and apply several automated processes used in manufacturing, service, and business processes. Topics include automated work systems, safety, and design of systems.

IENG4260 | Engineering Entrepreneurship | Lecture (3 Credits)

Explain the concept of transforming your ideas from a prototype into a business including customer need, design, launching, and sustaining a business. Topics include strategic thinking, business relationships, dealing with competition, and marketing.

IENG4270 | Manufacturing Processes II with Lab | Lecture/Laboratory (3 Credits)

Use CAD/CAM software to create part geometries, tooling design, tool path, machining parameters and post processes NC code. Design and create parts using other common manufacturing processes. Emphasis on the principles of design for each process. Processes include sheet metal forming, casting, welding, plastic fabrication, injection molding, and sheet metal forming.

HUMN2900 | Ethics of Artificial Intelligence | Lecture (3 Credits)

Artificial Intelligence (AI) is changing how we work and how we live our everyday lives, and new tools are being developed at an astounding pace. From chatbots to robots, AI tools—especially for those in technical fields—are embedded in our professional and personal lives. Making sure they are developed and used ethically, and transparently, is imperative. In this course, you will learn how to identify, analyze, and debate the philosophical issues raised by contemporary and future AI systems.

MATH1700 | Pre Calculus | Lecture (3 Credits)

Preparation for Calculus. Topics include understanding functions from symbolic, tabular, and graphical perspectives. Explore function transformations and composition, polynomial functions, rational polynomial functions, trigonometric functions, exponential functions, and conic sections. The focus is on problem solving using mathematical models to represent real world situations.

General Education: Mathematics

MATH1810 | Calculus I | Lecture (3 Credits)

The fundamental tool used by engineers and scientists to determine critical measurements, such as maximums, minimums and allowable rates of change. Computer software will enable the application of limits, derivatives, transcendental functions, implicit differentiation and related rates.

Prerequisite(s): MATH1700

General Education: Mathematics

MATH1820 | Calculus II | Lecture (3 Credits)

The fundamental tool used by engineers and scientists to determine critical measurements, such as calculating the area under curves or the capacities inside of complex geometries. Computer software will enable the application of the definite integral, the fundamental theorem of calculus, applications of integration, and numerical methods of integration.

Prerequisite(s): MATH1810, Or MATH1811, Or MATH1812

General Education: Mathematics

MATH2250 | Statistics | Lecture (3 Credits)

Descriptive and inferential statistics, frequency distributions, probability theory, and issues related to gathering data; computer spreadsheets facilitate the organization, analysis and display of data.

General Education: Mathematics

PHYS1800 | Physics I with Lab | Lecture/Laboratory (4 Credits)

Introduction to mechanics using differential calculus as a foundation.

Topics include kinematics and dynamics of linear motion, static equilibrium, the conservation of energy and momentum, mechanics of solids and fluids, and thermodynamics. The laboratory portion incorporates experimentation, instrumentation, and graphical tools to verify calculations in motion, mechanics and thermodynamics.

Prerequisite(s): MATH1810 Or MATH1811

General Education: Physical Sciences with Lab

COMM4100 | Technical Writing Capstone | Lecture (3 Credits)

Research, plan, and organize professional documents for the capstone project. Topics include assessment techniques, special audience considerations, professional speaking skills, and presentation aids.

General Education: Communications with Writing