MECHANICAL ENGINEERING

Program Description
The Mechanical Engineering bachelor’s degree prepares students to enter the field of engineering as mechanical engineers and to become licensed professional engineers. Graduates can find employment in a variety of industries, including architectural engineering, manufacturing, transportation and quality control/testing.

Students learn how to apply engineering principles to the work environment, how to work collaboratively in a team environment and how to use quality tools and data to anticipate and solve issues in the engineering process. Coursework includes study in engineering design (including 3D modeling), manufacturing materials, project management and basic industrial processes. Curriculum is project-based so that all engineering projects grow out of as well as providing students with the communication and critical thinking skills required to succeed in the profession.

All students complete a senior project or internship. Graduates are prepared to pass the Fundamentals of Engineering Exam, the first step in becoming licensed professional engineers (PE).

Dunwoody College of Technology: a non-profit, private technical college since 1914.

Degree Requirements

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Common Job Titles
- Mechanical Engineer
- Manufacturing Engineer
- Mechanical Designer
- HVAC Design Engineer

Recent Employers
New program; First graduating class in May 2020

Salary Data
- $82,370
  - Annual Average Salary

Placement Rate
New program; First graduating class in May 2020

How to Apply
- dunwoody.edu
- 612.374.5800
- info@dunwoody.edu

AY2016-17 Revised: 2.24.16
**Course Descriptions**

**MENG1120 Introduction to Engineering**
Explore major topics in Engineering. Provides students with a pathway to success in the program, including time management, industry software, study skills, internship availability and career opportunities.

**MDES1110 Engineering Drawings with SolidWorks**
Creation of 3D solid models, assemblies and related engineering documentation using SolidWorks. Blueprint reading and application of ASME/ANSI standards to CAD drawings.

**MENG1220 Introduction to Programming**
Use algorithms and flowcharts to develop logic, execution control, data types, loops, and control structures for computer executable software; employ National Instruments LabVIEW software and hardware.

**MENG2130 Statics**
Identification, recognition and calculations associated with forces acting on rigid bodies at rest. Use vector analysis to analyze concurrent forces, non-concurrent forces, friction forces, centroids and moments.

**MENG2110 Manufacturing Materials & Processes Lab**
Employ several of the manufacturing processes used in product engineering and manufacturing companies. Utilize several manufacturing processes and materials in the comparison of manufacturability. Hands on testing and analysis associated with materials such as metals, ceramics, polymers and composites and applicable testing procedures.

**MENG2120 Manufacturing Materials & Processes**
Identification, recognition and calculations associated with manufacturing processes and materials. Each process will be covered from a technical perspective with an emphasis placed on how multiple processes can be linked together. Processes include fundamental topics in chemical bonding and atomic structures of various materials including testing and manufacturability using processes such as machining, molding, stamping and welding.

**MENG2230 Dynamics**
Theory and calculations associated with kinematics and kinetics of particles, systems of particles and rigid bodies. Analyze the application of Newton's laws to the planar motion of rigid bodies.

**MENG2210 Geometric Dimensions & Tolerances Lab**
Apply the fundamental principles of geometric dimensioning and tolerancing using lab-based metrology equipment. Measure actual parts and verify specifications are within print callouts.

**MENG2220 Geometric Dimensions & Tolerances**
Identification, recognition and calculations associated with the fundamental principles of geometric dimensioning and tolerancing. Create prints that include callouts for various measurable standards of accuracy using ASME/ANSI standards.

**MENG2240 Design for Manufacturability**
Create designs and drawings for products to specific manufacturing methods. Analyze various manufacturing process capabilities and product requirements appropriate to both form and function.

**MENG3110 Electrical & Controls Engineering Lab**
Apply electrical and electronic controls to solve real-world problems. Topics include AC and DC motors, electronic sensors, programmable logic controllers, motor drives and human machine interfaces.

**MENG3120 Electrical & Controls Engineering**
Identification, recognition and calculations associated with electrical and electronic controls. Topics include AC and DC motors calculations, wiring diagrams, Ohm's Law, series and parallel circuits, electronic sensors, programmable logic controllers, motor drives and human machine interfaces.

**MENG3130 Introduction to Thermodynamics**
Theory and calculations associated with the principles of thermal energy as well applications of the first and second laws of thermodynamics. Topics include work and heat, control volume, steady states, uniform states, entropy, availability, power and refrigeration.

**MENG3140 Lean Manufacturing Principles**
Investigate several quality conventions used to reduce waste, improve quality, decrease production times and improve customer satisfaction. Topics include lean manufacturing, queuing models, industrial statistics, cycle/taut times, material handling and value stream mapping.

**MENG3210 Heat Transfer & HVACR Lab**
Hands on testing and analysis associated with heating, ventilation and air conditioning systems.

**MENG3220 Heat Transfer & HVACR**
Identification, recognition and calculations associated with fundamental topics in heat transfer and HVACR.

**MENG3230 Statistical Process Control**
Use statistical methods to study the quality of manufactured products. Topics include probability and statistics, control charts for variables, acceptance criteria, acceptance sampling, control charts for attributes and case studies. Statistical Quality Control can lead to a reduction in the time required to produce a product and ensure quality.

**MENG3240 CAD/CAM Systems**
Use CAD/CAM software to create part geometries, tool paths, machining parameters and post process NC code.

**MENG4110 Transmission of Power Lab**
Set up configuration and troubleshooting of installed simple and complex machines using machine schematics and related documentation. Systems include packaging equipment, machine tools and robotic systems. Components of interest include transmissions, motors, clutch, gears, chains, bearings, cams and accumulators.

**MENG4120 Transmission of Power**
Identification, recognition and calculations associated with various machine components used for electrical, mechanical and fluid power systems. Topics include transmissions, motors, clutches, gears, chains, bearings, cams and accumulators.

**MENG4130 Finite Element Analysis**
Finite element modeling using both manual and software simulation analysis. Topics include two- and three-dimensional elements along with applications in solid mechanics, heat transfer and fluid mechanics.

**MENG4140 Mechanical Design & Systems**
Examine advanced topics in modeling, design and best practices for machines, tooling and system assemblies. Topics include molds, dies, assembled parts, weldments and machined components.

**MENG4210 Engineering Co-op or Senior Project**
The Co-op / Senior Project course allows students to work part-time in an engineering capacity or to create the equivalent work experience through an in-house practicum experience. All students come together during the final week to conduct a presentation on their internship or practicum and explain how it applies to their engineering program outcomes.

**MENG4220 Leadership & Project Management**
Investigate tools that managers use to manage and control operations. Topics include project management, technology, Total Quality Management and operations strategy.

**MENG4230 Engineering Economics**
Combines the concepts of finance and economics with the engineering environment. Analyze costs, risk, funding options, economic return on investment, legal and environmental concerns.

**MENG4240 Design of Experiments**
Introduction to industrial experimentation through the use of statistical software to perform mathematical regression and analysis of variance for system functionality. Topics include randomized designs, blocking designs, full factorial designs and fractional factorial designs.
Course Descriptions

MATH1810 Calculus I
The fundamental tool used by engineers and scientists to determine critical measurements, such as maxima, minimaums and allowable rates of change. Computer software will enable the application of limits, derivatives, transcendental functions, implicit differentiation and related rates.

ENGL1010 English
Analyze the research and essay-writing process for purpose, planning, drafting, and revision. Explore writing patterns and thought development. Incorporate concepts of grammar and usage, documentation, source relevancy and credibility. Focus is on clear, concrete writing.

PHYS1800 Physics I with Lab
Introduction to mechanics using differential and integral 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.

MATH1820 Calculus II
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.

PHYS1820 Physics II with Lab
An introductory calculus-based course in electromagnetic fields and their applications. Topics include: Coulomb's and Gauss' Law, electric fields and potentials, electrical and magnetic properties of matter, Ampere's and Faraday's laws, elementary DC and AC circuits, Maxwell's equations, and electromagnetic waves.

MATH2810 Multivariable Calculus
Multivariable calculus is the extension of calculus in one variable to calculus in more than one variable: the differentiation and integration of functions involving multiple variables, rather than just one.

CHEM2110 Chemistry with Lab
Develop a basic understanding of the central principles of chemistry that are useful to explain and predict the properties of chemical substances based on their atomic and molecular structure; promotes the development of basic and advanced science process skills.

MATH2820 Linear Algebra & Differential Equations
Introduction to Linear Algebra, including vector spaces and linear mappings between such spaces. Explore solution methods for ordinary differential equations, qualitative techniques; includes matrix methods approach to systems of linear equations and series solutions.

HUMN4000 Ethical Decision-Making
Theory and application of ethics as it applies to engineering practice, education, and research. Topics will include rationale behind accepted engineering ethics codes, cultural issues in ethical standards, intellectual property issues, and ethical problem-solving techniques.