Engineering Technology (ENGTC)

ENGTC 1250: Statics for Engineering Technology
This course will provide a fundamental understanding of equilibrium of particles and rigid bodies subject to concentrated and distributed forces - which will introduce the basics for design and analysis of many types of structures and mechanical devices encountered in engineering. Topics will include vector analysis, forces, moments, free body diagrams and equilibrium that are applied to the analysis of frames, trusses, machines, cable-pully systems, and systems with friction. Lab work will consist of group problem-solving exercises along with performing traditional experiments in engineering statics. Graded on A-F basis only.

Credit Hours: 3
Prerequisites: Grade of C- or higher in MATH 1400 and PHYSCS 1210. Restricted to Engineering Technology students only

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ENGTC 2150: Fundamental Electronics
This course will provide a fundamental understanding of modern electronics from both a theoretical and applied perspective. The course will examine electrical safety concepts along with topics that include atoms and electricity, resistance, voltage, current, power, series circuits, parallel circuits, and series/parallel circuits. Advanced DC circuit theory and AC fundamentals are also explored. Circuits are constructed and analyzed using scientific instrumentation such as meters, oscilloscopes, and spectrum analyzers. Graded on A-F basis only.

Credit Hours: 3
Prerequisites: Grade of C- or higher in PHYSCS 1220. Restricted to Engineering Technology students only

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ENGTC 2250: Mechanics for Technology
This course will examine the mathematical determination of stress and deflection for materials having applied loads of normal shear, torsion, bending or a combination of these. Emphasis is placed of the behavior of engineering materials and the deflection of beams and column action. Topics will include stress, strain, torsion, shear & moment diagrams, bending and shear, deflection, beam design, and columns. Students will also explore bolted and welded connections and stress concentrations. Grad on A-F basis only.

Credit Hours: 3
Prerequisites: Grade of C- or higher in ENGTC 1250. Restricted to Engineering Technology students only

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ENGTC 2350: Materials, Processes, and Testing
This course will provide a fundamental understanding and Study of the relationships between structures and properties for common engineering materials, including metals, polymers, ceramics and composites. Mechanical behavior, temperature effects, heat treatment, corrosion and electrical properties are covered. This course is focused on materials and processes as students fabricate products and conduct experiments. Learning experiences include the use of tools and equipment related to analysis, testing, and processing of materials. This course provides students with an opportunity to gain hands-on experience with machine tools and gauging measurement instruments. Graded on A-F basis only.

Credit Hours: 3
Prerequisites: Grade of C- or higher in ENGTC 2250. Restricted to Engineering Technology students only

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ENGTC 3050: Instrumentation and Process Control
This course provides an introduction into the field of process control and instrumentation with an emphasis on manufacturing processes. The course will explore the concepts of industrial processes, variables, and control systems used to sense and regulate those variables. Labs reinforce theory and will involve the exploration of various sensors, transducers, and related control systems and instrumentation. Emphasis is placed on process variables and elements associated with pressure, flow, temperature, and level control concepts and systems. Open and closed loop control systems are evaluated, along with extensive work with PID control methodology. Graded on A-F basis only.

Credit Hours: 3
Prerequisites: Grade of C- or higher in ENGTC 2150. Restricted to Engineering Technology students only

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ENGTC 3200: Introduction to Robotics
This course will provide a fundamental understanding of industrial robotics and related systems. Hands-on labs will include extensive work with three different robotic systems. The course will explore fundamentals of industrial robotics, including history, safety, classifications, configurations, components, and programming methods and techniques. Emphasis is placed on programming languages and applied operation. Students with work with Fanuc 200iD six-axis robotic systems and Universal Robotics UR3e collaborative robots. Additionally, exercises exploring robotic integration and vision control are included. Graded on A-F basis only.

Credit Hours: 3
Prerequisites: Grade of C- or higher ENGTC 2250. Restricted to Engineering Technology students only

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ENGTC 3350: Machine Tool Technology
This course provides the fundamental concepts of machine tool technology, including safety, measurements, and layout - coupled with hands on work with simple machining operations utilizing milling machines and lathes. Topics include machine tool safety, basic blueprint reading and math, metrology, various hand and power tool practices, part layout, and exploration of both milling and engine lathe machines. Additionally, students will explore the basic operations of CNC machining with emphasis on CNC milling machines. Lab work consists of hands-on experiences with these various machining systems. Graded on A-F basis only.

Credit Hours: 3
Prerequisites: Grade of C- or higher in ENGTC 2250. Restricted to Engineering Technology students only

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ENGTC 3450: Fluid Power for Technology
This course addresses the practical application of fluid power principles used in the installation, maintenance, and troubleshooting of industrial hydraulic and pneumatic systems and related equipment. Topics include basic hydraulic and pneumatic principles and theory, safety considerations, identification of system components and equipment, and the interpretation of fluid power symbols and drawings. Lab work will consist of the application of fluid power knowledge and skills with industrial laboratory systems and components, including electrical control of fluid power systems. Graded on A-F basis only.

Credit Hours: 3
Prerequisites: Grade of C- or higher in MATH 1400 and PHYSCS 1210. Restricted to Engineering Technology students only

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ENGTC 4800: Industrial Safety and Risk Assessment
This course will provide an introduction to the principles of industrial safety, including their relationship to accident mitigation and prevention. Students will apply scientific and engineering principles to the analysis of various industrial processes and equipment in order to optimize facility safety. Topics will include material handling safety, personal protection equipment, chemical handling and hazards, machine safety, energy sources, general shop safety, fire hazards and prevention, and rigging principles. Students will be able to identify, evaluate, and control safety hazards via appropriate mitigation measures. Additionally, students will complete the OSHA 10 certification process. Graded on A-F basis only.

Credit Hours: 3
Prerequisites: Grade of C- or higher in ENGTC 2250. Restricted to Engineering Technology students only

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