Manufacturing Engineering Tech (MFGET)

MFGET 1500: Introduction to Manufacturing
This course will provide a fundamental understanding of modern manufacturing methods, practices, and processes. The course will examine the activity required to take a product from design to production, and how modern manufacturing practices are integrated within the production process to maximize efficiency. Students will explore traditional processes such as casting, molding, forming, cutting, and welding - along with leading-edge technology such as 3D printing. Modern manufacturing practices and methodology such as Lean, Six Sigma, and others will be explored. Labs will include metrology, basic fabrication, and a survey of modern automation techniques, including basic electronics, PLC control, and robotics. Graded on A-F basis only.

Credit Hours: 3
Prerequisites: Restricted to Engineering Technology students only

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MFGET 2500: Manufacturing Methods
This course explores modern manufacturing methods found in industry through both lecture and applied lab experiences. Machining, molding, casting, thermoforming, sheet metal forming, and electronics assembly will be discussed. Traditional manufacturing practices and how they relate to these processes will also be explored. Laboratory experiences will involve using measuring tools, hand tools, and machine tools to construct projects from drawings. Metrological instrumentation uses and inspection techniques will be covered. Disassembly and fabrication problems will be explored and analyzed along with applied exercises. Graded on A-F basis only.

Credit Hours: 3
Prerequisites: Grade of C- or higher in MFGET 1500. Restricted to Engineering Technology students only

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MFGET 2600: Computer Aided Manufacturing
This course will explore Computer Aided Manufacturing (CAM) as it relates to modern manufacturing. Focus is on the introduction of CAM technologies as well as computer-aided geometric modeling methods. Students will move from CAD/CAM theory and fundamentals to developing products from design to fabrication. SolidWorks will but utilized for the design and 3D modeling aspect, while Mastercam is used for generating the required Computer Numerical Control (CNC) code. Graded on A-F basis only.

Credit Hours: 3
Prerequisites: Grade of C- or higher in MFGET 2500. Restricted to Engineering Technology students only

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MFGET 3400: Manufacturing Process Improvement
This course introduces the student to the various methods and techniques d provide for continuous improvement in manufacturing. The course moves from creating a production baseline to mapping existing processes, examining quality, and determining the total costs of the manufacturing activities. The course will then provide insight to the various contemporary practices to guide continuous improvement in the manufacturing industry. Students will examine customer feedback, statistical quality control and industry trends including just-in-time production, lean manufacturing, TOYOTA practices, Lean Six-Sigma, ERP, and MRP will be discussed. Graded on A-F basis only.

Credit Hours: 3
Prerequisites: Junior standing required. Restricted to Engineering Technology students only

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MFGET 3700: Industrial Automation I
This course addresses the installation, programming, troubleshooting, and maintenance of programmable logic controllers (PLCs) as used in modern manufacturing applications. Topics include PLC history, installation fundamentals, basic and intermediate programming concepts, integration techniques, and troubleshooting procedures. Students will utilize Allen-Bradley LR16 series CompactLogic PLCs, coupled with Rockwell Automation Studio 5000 programming software. Emphasis is placed on hands-on programming and integration. Lab work will reinforce automation theory and move from basic programming to problem-based project modules. 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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MFGET 3800: Smart Manufacturing Technology
This course is focused on industrial automation and concepts of smart manufacturing as they relate to the Industry 4.0 paradigm. Focus is on the use advanced technology within modern manufacturing. Students will explore automated manufacturing systems, and the multitude of components utilized within those systems. Upon completion, students will be able to design automated systems and select components within the process areas of handling technology, industrial robotics, sensors, and control methods. Emphasis will be placed on data generation and movement within the systems. Graded on A-F basis only.

Credit Hours: 3
Prerequisites: Grade of C- or higher in MFGET 3700. Restricted to Engineering Technology students only

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MFGET 4700: Industrial Automation II
This course explores advanced PLC programming techniques and concepts, and advanced integration practices as related to modern industrial automation. Topics include intermediate and advanced PLC instructions and programming concepts, industrial communication practices and protocols, and HMI programming and integration. Students will utilize Allen-Bradley LR16 series CompactLogic PLCs, coupled with Rockwell Automation Studio 5000 programming software. Emphasis is placed on hands-on programming and integration. Graded on A-F basis only.

Credit Hours: 3
Prerequisites: Grade of C- or higher in MFGET 3700. Restricted to Engineering Technology students only