INTEGRATED ENGINEERING TECHNOLOGY (IET)

IET 104 (2 credit hours)
Blueprint Reading/Schematics
Introduces the fundamental information in drafting necessary to retrieve, read, manipulate, and understand a mechanical part print. Instructs students to recognize, identify, describe, and relate the components used in schematics, to include lines, multiview drawings, symbols, dimensioning techniques, various views, and sketches. Lecture: 1.5 credits (22.5 contact hours). Laboratory: 0.5 credits (15 contact hours).
Attributes: Course Also Offered in Modules, Technical
Components: LAB: Laboratory, LEC: Lecture

IET 111 (1 credit hours)
Lean Safety Culture
Instructs students in lean manufacturing concepts which will encompass the instructional methodologies of this course. Provides students with intense hands-on laboratory instruction of lean safety culture concepts and the importance of developing a culture of continuous safe work habits. Institutes the ability to predict safety issues through hazard prevention. Analyzing accidents, along with human barriers to safety-based intervention, guides students to actively and effectively measure and evaluate safety procedures as a component of continuous improvement. Charges students with risk assessment activities and development of visual safety displays and delivering individual and group presentations to stakeholders. Lecture: 0.5 credits (7.5 contact hours). Laboratory: 0.5 credits (22.5 contact hours).
Attributes: Technical
Components: LAB: Laboratory, LEC: Lecture

IET 112 (1 credit hours)
Lean Manufacturing Concepts -TPS
Instructs students in lean manufacturing concepts which will encompass the instructional methodologies of this course. Introduces the student to Lean Manufacturing concepts that provide the techniques for streamlining missions in any manufacturing environment. Implements hands-on processes to Lean Manufacturing. Provides the student with an understanding of workflow, velocity, and lead-time. Discusses how waste affects both profit and customer satisfaction. Guides students toward developing and quantifying lean strategies at every step of the manufacturing process. Instructs in the concepts and tools of Lean Manufacturing including types of waste, visual management, value stream analysis, flow, just-in-time, pull, and Kaizen. Lecture: 0.5 credits (7.5 contact hours). Laboratory: 0.5 credits (22.5 contact hours).
Attributes: Technical
Components: LAB: Laboratory, LEC: Lecture

IET 113 (1 credit hours)
Lean 5S Methodology
Instructs students in lean manufacturing concepts which will encompass the instructional methodologies of this course. Provides students with intense hands-on laboratory instruction of lean 5S principles and methods for implementing workplace organization. Instructs students on the lean 5S tools applied to organizing and maintaining workplace environments. Builds on the foundation of lean manufacturing concepts and culture by delivering a hands-on approach to the development of a safe, organized working environment. Produces an understanding of the purpose and benefits behind Lean 5S methodology. Instructs the students on the importance of professionalism, teamwork, and communication skills. Participate in group activities and assignments to provide the student with workplace organization skills that are expected by employers upon employment entry. Lecture: 0.5 credits (7.5 contact hours). Laboratory: 0.5 credits (22.5 contact hours).
Attributes: Technical
Components: LAB: Laboratory, LEC: Lecture

IET 114 (1 credit hours)
Lean Problem Solving Methodology
Instructs students in lean manufacturing concepts which will encompass the instructional methodologies of this course. Provides students with intense hands-on laboratory instruction of lean problem-solving principles and methods. Instructs students on the Lean 8-Step Problem Solving process based on the Toyota Business Practice model. Imparts a systematic approach to addressing performance and behavioral qualities that are needed for effective and efficient problem-solving outcomes. Instructs the students how to clarify and break down a problem, set achievable targets, analyze the root cause, develop countermeasures, evaluate results processes, standardize the results, and learn from failures. Fosters the development of a customer-first philosophy involving all the stakeholders. Instructs the students on the importance of professionalism, teamwork, and communication skills. Participate in group activities and assignments to provide the student with problem solving skills that are expected by employers. Lecture: 0.5 credits (7.5 contact hours). Laboratory: 0.5 credits (22.5 contact hours).
Attributes: Technical
Components: LAB: Laboratory, LEC: Lecture

IET 115 (1 credit hours)
Lean Machine Reliability
Instructs students in lean manufacturing concepts which will encompass the instructional methodologies of this course. Provides students with intense hands-on laboratory instruction of lean machine reliability concepts. Describes predictive and corrective maintenance and explains how these differ from preventive maintenance. Breaks down proactive maintenance and the underlying tools and integral operations and procedures. Instructs the students in the various individual units in a system and the steps in evaluating failure mode risks and countermeasures. Lecture: 0.5 credits (7.5 contact hours). Laboratory: 0.5 credits (22.5 contact hours).
Attributes: Technical
Components: LAB: Laboratory, LEC: Lecture

IET 121 (4 credit hours)
Basic Electricity
Introduces the various elements of basic electricity and electronics including ohms law, the identification of electrical symbols, interpretation of schematics, cross-referencing prints, tracing circuits, interpreting sequential function charts, line drawings, and time charts. Introduces the student to AC and DC series and parallel circuits consisting of resistive, inductive, and capacitive loads. Discusses operation of particular electronic devices such as diodes and their applications. Demonstrates troubleshooting, safety, and the appropriate use of electrical measurement instruments, including digital and analog multimeters, voltmeters, and clamp-on ammeters. Instructs on basic control circuit configurations and components to provide the student with practical concepts of basic electrical circuits. Utilizes lean manufacturing concepts throughout the instructional methodologies of this course. Lecture: 2 credits (30 contact hours). Laboratory: 2 credits (60 contact hours).
Pre-requisite: MAT 126 or higher-level math course.
Attributes: Technical
Components: LAB: Laboratory, LEC: Lecture

IET 124 (4 credit hours)
Introduction to Welding and Fabrication
Introduces the power sources used in shielded metal arc welding (SMAW) and gas metal arc welding (GMAW), along with equipment and filler metals used to produce a welded joint. Describes welding principles along with the metallurgy of steel and welding. Covers shielded metal arc welding safety and shielded metal arc welding processes including flat, horizontal, vertical, and overhead welding techniques. Provides knowledge of theory, safety practices, equipment and techniques required for gas metal arc welding, including different transfer methods and welding positions. Introduces oxy-fuel welding and cutting, including safety, setup and maintenance of oxy-fuel welding and cutting equipment. Includes cutting, brazing, and welding techniques. Lecture: 2 credits (30 contact hours). Laboratory: 2 credits (60 contact hours).
Attributes: Technical
Components: LAB: Laboratory, LEC: Lecture

IET 128 (3 credit hours)
Introduction to Machine Tool Operation
Instructs students in lean manufacturing concepts which will encompass the instructional methodologies of this course. Introduces machining operations, procedures, and machines used by multi-skilled industrial maintenance technicians. Introduces the safe and correct operation of lathes, milling machines, drill presses, metal saws, and hand and power tools. Requires students to work with various measuring and layout tools found in industrial environments. Lecture: 1 credit (15 contact hours) Laboratory: 2 credits (60 contact hours).
Attributes: Technical
Components: LAB: Laboratory, LEC: Lecture

IET 202 (4 credit hours)
Motor Controls and Sensing Devices
Instructs students in lean manufacturing concepts which will encompass the instructional methodologies of this course. Covers the diversity of motor control circuits and devices including: theory of operation and applications in automation control, troubleshooting, and repair. Introduces identification, installation, replacement, and troubleshooting of electronic input and output sensing devices, relays, motor starters, and contactors. Provides an introduction of proportional integral and derivative control. Includes automation output devices including AC, DC, relays, and motor starters along with sizing of components for various applications. Lecture: 2 credits (30 contact hours.) Laboratory: 3 credits (60 contact hours).
Pre-requisite: IET 121, or EET 119, or ELT 110 or (IMT 110 and IMT 111).
Attributes: Technical
Components: LAB: Laboratory, LEC: Lecture

IET 204 (6 credit hours)
Automated Motor Controls
Instructs students in lean manufacturing concepts which will encompass the instructional methodologies of this course. Introduces principles, applications, and elements needed for an integrated automated industrial control system. Integrates Programmable Logic Controllers (PLC) with AC and DC electric motor speed control using variable speed drives, variable frequency drives, and soft starters. Includes installation practices, logic fundamentals, and numbering systems relative to PLC programming of inputs, outputs, timers and counters, comparators, basic data manipulation, and safety circuits as well as, programming practices for VFD and VSD systems. Lecture: 3 credits (45 contact hours). Laboratory: 3 credits (90 contact hours).
Pre-requisite: [IET 121 or ELT 110 or EET 119 or (IMT 110 and IMT 111) with a minimum letter grade of "C"] and [IET 202 or (EET 270 and 271) or (IMT 220 and 221) with a minimum letter grade of "C"] or consent of Integrated Engineering Technology program coordinator.
Attributes: Technical
Components: LAB: Laboratory, LEC: Lecture

IET 205 (4 credit hours)
Robot Maintenance
Introduces robotics in regard to industrial robotic safety standards, applications, types of classes for industrial robots, basic system components, robotic motion concepts, key programming techniques, definitions and the common terms associated with computer integrated manufacturing (CIM) as it relates to robotic cells. Instructs students on the mastering concepts of preventive maintenance techniques required for a robot and their backup systems in addition to recovery procedures needed to interpret robot error codes and perform a safe recovery start up procedure on robotics equipment, as well as integrating robotic applications in a PLC-controlled, automated system. Lecture: 2.5 credits (37.5 contact hours) Laboratory: 1.5 credits (45 contact hours).
Attributes: Course Also Offered in Modules, Technical
Components: LAB: Laboratory, LEC: Lecture

IET 207 (4 credit hours)
Electro-Hydraulics and Pneumatics
Instructs students in lean manufacturing concepts which will encompass the instructional methodologies of this course. Explains the fundamental concepts of fluid power and electro-fluid power systems. Covers the principles of fluid power, calculations of physical properties of fluids, and their ability to do work. Introduces the various fluid power components, symbols, and circuits. Introduces troubleshooting of fluid power components and systems with an emphasis on safety. Addresses fluids, filters, reservoirs, piping, pumps, actuators, accumulators, control valves, and combination circuits. Lecture: 2 credits (30 contact hours) Laboratory: 2 credits (60 contact hours).
Attributes: Technical
Components: LAB: Laboratory, LEC: Lecture

IET 208 (4 credit hours)
Mechanical Drives
Instructs students in lean manufacturing concepts which will encompass the instructional methodologies of this course. Introduces safety, maintenance techniques, and procedures used to maintain industrial equipment, including industrial couplings, chains, sprockets, belts, bearings, shafts, brakes, clutches, gears, and cams. Addresses the principles of power transmission, calculations of speed and force transmission. Lecture: 2 credits (30 contact hours) Laboratory: 2 credits (60 contact hours).
Attributes: Technical
Components: LAB: Laboratory, LEC: Lecture