

ADVANCED MANUFACTURING TECH (AMT)

AMT 1020 – Preventive Maintenance

2 Credit hours

Introduces how routine work is done to keep equipment in good working order and to optimize its efficiency and accuracy. Addresses regular routine cleaning, lubricating, testing, checking for wear and tear and eventually replacing components to avoid breakdown. Introduces students to the various types and styles of predictive and preventive maintenance components, principles and practices used in industrial applications.

AMT 1040 – Blueprint Reading and Schematics

2 Credit hours

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, along with their symbols and connectors, to describe electrical, electronics, pneumatics, hydraulics and piping circuits, as well as welding and joining symbols interpretation.

AMT 1070 – Basic Electricity and Electronics

3 Credit hours

Introduces the various elements of basic electricity including the identification of electrical symbols as well as interpretation of schematics, cross referencing prints, tracing circuits, interpreting sequential function charts, line drawings and time charts. Introduces the student to electrical measurement instruments, including digital and analog multimeters, clamp-on ammeters, megohmmeters, and the oscilloscope. Concentrates on control logic components and circuit function. Introduces the student to solid state devices and applications.

AMT 1080 – Mechanical Drive Systems

3 Credit hours

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 and how they affect a power transmission system.

AMT 1091 – Safety

2 Credit hours

Introduces OSHA and the OSHA regulations that apply to the auto manufacturing industry. Provides the knowledge and skills necessary to help sustain life and minimize the consequences of injury or sudden illness to meet the various training needs of those in workplace, school or community settings.

AMT 1092 – Rigging

1 Credit hour

Introduces safety rules and issues in the use of overhead cranes, hoists, rigging equipment, attachment components, calculating sling angle stresses, and safe lifting and turning loads.

AMT 1100 – Welding and Fabrication

3 Credit hours

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. Welding principles will be introduced along with the metallurgy of steel and welding. Introduces 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 position welding. Introduces oxy-fuel welding and cutting, including safety, setup and maintenance of oxy-fuel welding and cutting equipment. Techniques taught in this course include cutting, brazing, and welding.

AMT 1180 – Tool and Gage Design

2 Credit hours

Emphasizes design fixtures (drilling, milling, boring, welding) and gauges (plug, ring, feeler, indicators, relation). The design assignments feature loading, locating and clamping considerations.

AMT 1200 – Machine Tool Operations

3 Credit hours

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. Students will work with various measuring and layout tools found in industrial environments.

AMT 2010 – Electrohydraulics and Pneumatics

4 Credit hours

Provides an explanation of 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, 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.

AMT 2030 – Programmable Logic Controllers

3 Credit hours

Introduces the Programmable Logic Controllers (PLC) and elements needed for an automated industrial control system. Introduces memory and project organization within a PLC and provides instruction in basic numbering systems, computer and PLC terminology. Introduces PLC control functions, program structures, language standards, wiring and troubleshooting methods, as well as, real world communications. Requires the student to program a PLC which may include a combination of ladder logic, structured text, sequential function chart and/or function block languages. Includes various protocols of industrial communications used between PLC controlled machines, PLC to PLC, PLC to computer and computer to computer.

AMT 2050 – Robot Maintenance

3 Credit hours

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.

AMT 2060 – Controls and Instrumentation

3 Credit hours

Covers the diversity of control devices including: theory of operation, applications in automation control and troubleshooting and repair. Introduces identification, installation, replacement, and troubleshooting of automation controller circuit boards and modules. This course also introduces the installation, maintenance and troubleshooting of common input devices. Methods of motor controls including on-off, proportional, integral, and derivative including PID loop tuning and quality are discussed. Automation output devices including AC, DC, and servo motors, variable speed drivers, relays, motor starters and sizing of components for various applications is also covered.

AMT 2550 – Fundamentals of Plumbing and Pipefitting

2 Credit hours

Provides discussion of the specifications, applications and maintenance of pipes, fittings and valves; simple pipe calculations and template development; tools used in piping; proper valve installations and maintenance and consideration of safe working pressures for pipes and valves.

AMT 2970 – Troubleshooting Capstone  

3 Credit hours

Provides students with the skills and knowledge to be proficient in diagnosing and repairing advanced integrated technology. Students will combine the skills acquired throughout their studies to diagnose and troubleshoot the Integrated Technology Trainer. The course is designed to simulate real world environment and support teamwork concepts necessary to be successful in industry. The course will include an e-portfolio assignment and an exit evaluation of critical thinking and writing.