

INDUSTRIAL MAINTENANCE TECHNOLOGY (IMT)

IMT 100 (3 credit hours)

Welding for Maintenance

Provides basic instruction needed for student to weld using SMAW (Stick), GMAW (MIG), GTAW (TIG), and Oxy-Fuel processes. Lecture: 3 credits (45 contact hours).

Co-requisite: (IMT 101 or (IMT 1011 - IMT 1014)) or Consent of Instructor.

Attributes: Course Also Offered in Modules, Technical

Components: LEC: Lecture

IMT 101 (2 credit hours)

Welding for Maintenance Lab

Provides application of basic welding skills used in SMAW (Stick), GMAW (MIG), GTAW (TIG) and Oxy-Fuel. Laboratory: 2 credits (60 contact hours).

Co-requisite: IMT 100 or consent.

Attributes: Course Also Offered in Modules, Technical

Components: LAB: Laboratory

IMT 110 (3 credit hours)

Industrial Maintenance Electrical Principles

Introduces the theory of electricity and magnetism and the relationship of voltage, current, resistance, and power in electrical circuits. Develops an understanding of alternating and direct current fundamentals. Applies formulas to analyze the operation of AC and DC circuits. Lecture: 3 credits (45 contact hours).

Co-requisite: : IMT 111 or Consent of Instructor.

Attributes: Course Also Offered in Modules, Technical

Components: LEC: Lecture

IMT 111 (2 credit hours)

Industrial Maintenance Electrical Principles Lab

Verifies knowledge of basic theory by making measurements in working AC and DC circuits. Provides for the construction of various types of circuits and the measurement of their parameters. Stresses the use of test equipment, safety, and troubleshooting. Laboratory: 2 credits (60 contact hours).

Co-requisite: IMT 110 or Consent of Instructor.

Attributes: Course Also Offered in Modules, Technical

Components: LAB: Laboratory

IMT 115 (2 credit hours)

Maintenance Machining I

Includes fundamental machining operations necessary for the success of Maintenance Technicians in the field who are required to be proficient in basic machining operations. Lecture: 2 credits (30 contact hours).

Co-requisite: IMT 116.

Attributes: Course Also Offered in Modules, Technical

Components: LEC: Lecture

IMT 116 (5 credit hours)

Maintenance Machining I Lab

Includes the application of fundamental machining operations necessary for the success of Maintenance Technicians in the field who are required to be proficient in basic machining operations. Laboratory: 5 credits (150 contact hours).

Co-requisite: IMT 115 or Consent.

Attributes: Course Also Offered in Modules, Technical

Components: LAB: Laboratory

IMT 120 (3 credit hours)

Industrial Maintenance Rotating Machinery

Students will learn the basic principles needed for the proper maintenance of AC and DC motors. Lecture: 3 credits (45 contact hours).

Pre-requisite: Permission of the instructor.

Attributes: Technical

Components: LEC: Lecture

IMT 121 (2 credit hours)

Industrial Maintenance Rotating Machinery Lab

Provides practical experience in the construction, operation and maintenance of AC motors and alternators and DC motors and generators. Laboratory: 2 credits (60 contact hours).

Co-requisite: IMT 120 or Consent of Instructor.

Attributes: Technical

Components: LAB: Laboratory

IMT 138 (5 credit hours)

Lean Manufacturing

Instructs the students in the basic concepts of a safety culture and hazard prediction training. Introduces the fundamental 5S process, the Toyota Production System for Maintenance, the Toyota Problem Solving method, the Toyota Drive and Dedication model, and the Toyota Maintenance Reliability Process and Reliability Centered Maintenance Analysis. Lecture: 5.0 credits (75 contact hours).

Attributes: Course Also Offered in Modules, Technical

Components: LEC: Lecture

IMT 140 (3 credit hours)

Industrial Mechanics

Introduces the fundamental principles of fluid power, mechanical systems, and the relationship between voltage, current, resistance, and power in electrical circuits. Presents a broad range of technical information used in industry today by technicians, mechanics, and maintenance personnel. Lecture: 3 credits (45 contact hours).

Co-requisite: IMT 141.

Attributes: Technical

Components: LEC: Lecture

IMT 141 (1 credit hours)

Industrial Mechanics Lab

Provides laboratory experiences for constructing and adjusting basic fluid power circuits, installing and adjusting mechanical drive components, and taking measurements in operational AC and DC electrical circuits. Stresses the use of common hand tools, test instruments, safety, and troubleshooting. Lab: 1 credit (30 contact hours).

Co-requisite: IMT 140.

Attributes: Technical

Components: LAB: Laboratory

IMT 150 (3 credit hours)

Maintaining Industrial Equipment I

Introduces the student to maintenance techniques and procedures used to maintain industrial equipment. Lecture: 3 credits (45 contact hours).

Co-requisite: IMT 151 or Consent of Instructor.

Attributes: Course Also Offered in Modules, Technical

Components: LEC: Lecture

IMT 151 (2 credit hours)

Maintaining Industrial Equipment I Lab

Provides the student with lab experience in the maintenance of industrial equipment. Laboratory: 2 credits (60 contact hours).

Co-requisite: IMT 150 or Consent of Instructor.

Attributes: Course Also Offered in Modules, Technical

Components: LAB: Laboratory

IMT 160 (2 credit hours)**FANUC Robot Operations**

Introduces students to basic FANUC robotics programming as well as providing introductory operational skills needed in an industrial environment. Integrated Lecture: 1 credit (15 contact hours). Integrated Lab: 1 credit (30 contact hours).

Attributes: Technical

Components: LAI: Integrated Laboratory, LEI: Integrated Lecture

IMT 161 (2 credit hours)**KUKA Robot Level 1 Robot Operation**

Introduces students to basic KUKA robotic programming as well as providing introductory operational skills needed in an industrial environment. Integrated Lecture: 1 credit (15 contact hours). Integrated Lab: 1 credit (30 contact hours).

Attributes: Technical

Components: LAI: Integrated Laboratory, LEI: Integrated Lecture

IMT 162 (2 credit hours)**YASKAWA/MOTOMAN Robot Operations**

Introduces students to basic YASKAWA/MOTOMAN robotic programming as well as providing introductory operational skills needed in an industrial environment. Integrated Lecture 1.0 credit hour (15 contact hours). Integrated Lab 1.0 credit hour (30 contact hours).

Attributes: Technical

Components: LAI: Integrated Laboratory, LEI: Integrated Lecture

IMT 198 (1-8 credit hours)**Practicum**

Provides supervised on-the-job work experience related to the student's educational objectives. Students participating in the Practicum do not receive compensation. Practicum: 1-8 credits (75-600 contact hours).

Pre-requisite: Permission of Instructor.

Attributes: Technical

Components: PCM: Practicum

IMT 199 (1-8 credit hours)**Cooperative Education**

Provides supervised on-the-job work experience related to the student's educational objective. Students participating in the Co-op Education program receive compensation for their work. Co-op: 1 - 8 credits (75-600 contact hours).

Pre-requisite: Permission of Instructor.

Attributes: Technical

Components: COP: Co-op

IMT 200 (4 credit hours)**Industrial Robotics and Robotic Maintenance**

Provides the industrial maintenance student an introduction to the theory of robots including applications, basic programming, components, industrial robotic safety standards, industrial robots classifications, key programming techniques, robotic motion concepts, and terminology. Instructs students on the concepts of preventive and predictive maintenance techniques required for a robot and their backup systems and recovery procedures. Provides the opportunity for the industrial maintenance student to develop, set up, and integrate work cells into manufacturing systems at a beginning level. Lecture/Lab: 4.0 credits (90 contact hours).

Pre-requisite: IMT 110 and IMT 111 or Consent of Instructor.

Attributes: Technical

Components: LEC: Lecture

IMT 220 (3 credit hours)**Industrial Maintenance Electrical Motor Controls I**

Addresses the common symbols used in motor control circuits, the fundamentals of electrical schematics and wiring diagrams, the principles of relays, motor starters, switches, pilot devices, sensing devices, and indicator lights, and introduces the different types and operations of basic motor control circuits. Lecture: 3 credits (45 contact hours).

Pre-requisite: IMT 110, & IMT 111.

Co-requisite: IMT 221.

Attributes: Course Also Offered in Modules, Technical

Components: LEC: Lecture

IMT 221 (2 credit hours)**Industrial Maintenance Electrical Motor Controls I Lab**

Includes an application of common symbols used in motor control circuits, fundamentals of electrical schematics and wiring diagrams, principles of relays, motor starters, switches, pilot devices, sensing devices, indicator lights, and the different types and operations of basic motor control circuits. Laboratory: 2.0 credits (60 contact hours).

Pre-requisite: (IMT 110 and IMT 111) or consent of instructor.

Co-requisite: IMT 220.

Attributes: Course Also Offered in Modules, Technical

Components: LAB: Laboratory

IMT 222 (2 credit hours)**Industrial Maintenance Motor Controls II**

Provides advanced study of motor controls in industry. Addresses open and closed loop control systems, servo motors, encoders, AC and DC motors and industry standard color coding. Lecture: 2 credits (30 contact hours).

Pre-requisite: (IMT 110 and IMT 111 and IMT 220 and IMT 221) or consent of instructor.

Co-requisite: IMT 223.

Attributes: Course Also Offered in Modules, Technical

Components: LEC: Lecture

IMT 223 (2 credit hours)**Industrial Maintenance Motor Controls II Lab**

Provides advanced study of motor controls in industry. Addresses open and closed loop control systems, servo motors, encoders, AC and DC motors and industry standard color coding. Laboratory: 2 credits (60 hours).

Pre-requisite: (IMT 110 and IMT 111 and IMT 220 and IMT 221) or consent of instructor.

Co-requisite: IMT 222.

Attributes: Course Also Offered in Modules, Technical

Components: LAB: Laboratory

IMT 230 (5 credit hours)**Industrial Maintenance of PLCs**

This course includes the theory of programmable logic controllers to include installation, programming, interfacing, and troubleshooting of industrial PLC's.

Pre-requisite: IMT 240

Attributes: Technical

Components: LEC: Lecture

IMT 231 (2 credit hours)**Industrial Maintenance of PLC's Lab**

Addresses the diversity of PLC control devices and applications used in industry today. Safety and electrical lockouts are also included.

Laboratory: 2 credits (60 contact hours).

Pre-requisite: [(IMT 110 and 111) or IMT 130 and 131] with a grade of C or greater] or Consent of Instructor.

Co-requisite: IMT 230 or Consent of Instructor.

Attributes: Technical

Components: LAB: Laboratory

IMT 240 (6 credit hours)**Industrial Maintenance Motor Control Concepts**

Addresses the diversity of control devices and applications used in industry today with safety and electrical lockouts included. The basic theory of programmable logic controllers is also included. Lecture: 6 credits (90 contact hours).

Pre-requisite: [(IMT 110 and IMT 111) or (IMT 130 and IMT 131) with a grade of C or greater] or Consent of Instructor.

Co-requisite: IMT 241 or Consent of Instructor.

Attributes: Technical

Components: LEC: Lecture

IMT 241 (4 credit hours)**Industrial Maintenance Motor Control Concepts Lab**

Verifies knowledge of basic theory by making measurements in working AC and DC circuits. Various types of circuits are constructed and their parameters measured. The use of test equipment, safety, and troubleshooting are stressed. This lab course also provides practical experience in the construction, operation, and maintenance of AC and DC motors. Prerequisite: [(IMT 110 and 111) or (IMT 130 and 131) with a grade of C or greater] or Consent of Instructor. Corequisite: IMT 240 or Consent of Instructor. Laboratory: 4 credits (120 contact hours).

Attributes: Technical

Components: LAB: Laboratory

IMT 250 (2 credit hours)**Maintaining Industrial Equipment II**

Integrates the student's accumulative knowledge from the IMT 150 and IMT 151 courses. Emphasizes troubleshooting techniques and applied machine repair situations that require the student to apply learned skills from all areas of the curriculum. Lecture: 2.0 credits (30 contact hours).

Pre-requisite: (IMT 150 and 151) with a grade of "C" or greater or consent of instructor.

Co-requisite: IMT 251 or consent of instructor.

Attributes: Technical

Components: LEC: Lecture

IMT 251 (3 credit hours)**Maintaining Industrial Equipment II Lab**

Complements IMT 250 and consists of advanced, specific and assigned machine repair tasks. Laboratory: 3.0 credits (90 contact hours). Lab: 3.0 credits (90 contact hours).

Pre-requisite: (IMT 150 and 151) with a grade of "C" or greater or consent of instructor.

Co-requisite: IMT 250 or consent of instructor.

Attributes: Technical

Components: LAB: Laboratory

IMT 260 (7 credit hours)**Presswork and Die Maintenance**

Includes the fundamental concepts and machining operations needed by the industrial maintenance technician to be proficient in the field of stamping press and die maintenance. Lecture: 2 credits (30 contact hours), Lab: 5 credits (150 contact hours).

Pre-requisite: IMT 100 and IMT 101 and [(IMT 115 & IMT 116) or (MTT 114) or (MTT 110 & MTT 112)] or consent of instructor.

Attributes: Technical

Components: LEC: Lecture

IMT 280 (3 credit hours)**Advanced Programmable Logic Controllers**

Covers advanced theory programmable logic controllers to include designing applications, programming, interfacing and troubleshooting of industrial PLCs. Lecture: 3 credits (45 contact hours).

Pre-requisite: ((IMT 220 and IMT221 with a grade of "C" or greater) or (equivalent) or Consent of Instructor).

Co-requisite: IMT 281 or Instructor consent.

Attributes: Course Also Offered in Modules, Technical

Components: LEC: Lecture

IMT 281 (2 credit hours)**Advanced Programmable Logic Controllers Lab**

Provides practical applications of the theory in IMT 280 to include installation, programming, interfacing and troubleshooting of industrial PLCs. Laboratory: 2 credits (60 contact hours).

Pre-requisite: (IMT 220 and 221) with a grade of C or greater) or Consent of Instructor.

Co-requisite: IMT 280 or Consent of Instructor.

Attributes: Course Also Offered in Modules, Technical

Components: LAB: Laboratory

IMT 282 (3 credit hours)**PLC Programming Languages**

Covers the use of the four main Programmable Logic Controllers (PLC) programming languages specified in the International Electrotechnical Commission (IEC) 61131-3 international standard: Ladder Diagram, Function Block Diagram, Structured Text, and Sequential Function Chart. Discusses a variety of PLC networking protocols such as Ethernet/IP. Lecture: 2 credits (30 contact hours). Laboratory: 1 credit (30 contact hours).

Pre-requisite: IMT 280 or ELT 250 or EET 276 and EET 277 or Consent of Instructor.

Attributes: Technical

Components: LAB: Laboratory, LEC: Lecture

IMT 289 (1 credit hours)**Industrial Maintenance Technology Capstone**

Serves as the capstone course for the Industrial Maintenance Technology degree program. Integrates prior learning outcomes into a single integrated learning experience. Includes preparation for an exit exam that all program graduates must take. Lecture: 1.0 credit (15 contact hours).

Pre-requisite: ((BRX 120 or ELT 102) and FPX 100 and FPX 101 and IMT 100 and IMT 101 and IMT 110 and IMT 111 and IMT 150 and 151 and IMT 220 and IMT 221) or consent of instructor.

Attributes: Technical

Components: LEC: Lecture

IMT 290 (1-3 credit hours)**Special Problems**

Provides an opportunity to develop advanced skills in topics related to industrial maintenance. Laboratory: 1-3 credits (30-90 contact hours).

Pre-requisite: Consent of Instructor.

Attributes: Technical

Components: LAB: Laboratory

IMT 1001 (0.75 credit hours)**Welding for Maintenance Safety**

Provides basic instruction needed for student to weld using Oxy-Fuel.

Lecture: 0.75 credit (11.25 contact hours).

Co-requisite: IMT 1011 (or consent of instructor).

Components: LEC: Lecture

IMT 1002 (0.75 credit hours)**Welding for Maintenance SMAW (Stick Welding)**

Provides basic instruction needed for student to weld using Shielded Metal Arc Welding (SMAW). Lecture: 0.75 credit (11.25 contact hours).

Co-requisite: IMT 1012 (or consent of instructor).

Components: LEC: Lecture

IMT 1003 (0.75 credit hours)**Welding for Maintenance GMAW (MIG Welding)**

Provides instruction of setup and use of GMAW (MIG welding) equipment.

Lecture: 0.75 credit (11.25 contact hours).

Co-requisite: IMT 1013 (or consent of instructor).

Components: LEC: Lecture

IMT 1004 (0.75 credit hours)**Welding for Maintenance GTAW (TIG Welding)**

Provides instruction of setup and use of GTAW (TIG welding) equipment.

Lecture: 0.75 credit (11.25 contact hours).

Co-requisite: IMT 1014 (or consent of instructor).

Components: LEC: Lecture

IMT 1011 (0.5 credit hours)**Welding for Maintenance Safety and Cutting Lab**

Provides application of welding safety and use of oxy-fuel cutting equipment. Laboratory: 0.5 credit (15 contact hours).

Co-requisite: IMT 1001 (or consent of instructor).

Components: LAB: Laboratory

IMT 1012 (0.5 credit hours)**Welding for Maintenance SMAW (Stick Welding) Lab**

Provides application of setup and use of SMAW (stick welding) equipment. Laboratory: 0.5 credit (15 contact hours).

Co-requisite: IMT 1002 (or consent of instructor).

Components: LAB: Laboratory

IMT 1013 (0.5 credit hours)**Welding for Maintenance GMAW (MIG Welding) Lab**

Provides application of setup and use of GMAW (MIG welding) equipment. Laboratory: 0.5 credit (15 contact hours).

Co-requisite: IMT 1003 (or consent of instructor).

Components: LAB: Laboratory

IMT 1014 (0.5 credit hours)**Welding for Maintenance GTAW (TIG Welding) Lab**

Provides application of setup and use of GTAW (TIG welding) equipment.

Laboratory: 0.5 credit (15 contact hours).

Co-requisite: IMT 1004 (or consent of instructor).

Components: LAB: Laboratory

IMT 1151 (0.2 credit hours)**General Shop Knowledge**

Includes fundamental machining operations necessary for the success of Maintenance Technicians in the field who are required to be proficient in basic machining operations. Lecture: 0.2 credit (3 contact hours).

Co-requisite: IMT 1161 or Consent of Instructor.

Components: LEC: Lecture

IMT 1152 (0.1 credit hours)**Vertical and Horizontal Bandsaw Operations**

Introduces vertical and horizontal bandsaw operations including the selection of feeds and speeds as well as blade welding. Lecture: 0.1 credit (1.5 contact hours).

Co-requisite: IMT 1162 or Consent of Instructor.

Components: LEC: Lecture

IMT 1153 (0.3 credit hours)**Drill Press Operations and Procedures**

Introduces drill press operations including the selection of feeds and speeds, layout, drill bit selection and sharpening, and precision drilling operations. Lecture: 0.3 credit (4.5 contact hours).

Co-requisite: IMT 1163 or Consent of Instructor.

Components: LEC: Lecture

IMT 1154 (0.8 credit hours)**Lathe Operations and Procedures**

Introduces lathe operations including lathe components, grinding tool bits, the selection of feeds and speeds, turning operations, and threading.

Lecture: 0.8 credit (12 contact hours).

Pre-requisite: IMT 1151 or Consent of Instructor.

Co-requisite: IMT 1164 or Consent of Instructor.

Components: LEC: Lecture

IMT 1155 (0.6 credit hours)**Milling Machine and Surface Grinder Operations and Procedures**

Introduces milling and surface grinding operations including vise alignment, tramming, selection of feeds and speeds, form tools, dressing grinding wheels. Lecture: 0.6 credit (9 contact hours).

Pre-requisite: IMT 1151 or Consent of Instructor.

Co-requisite: : IMT 1165 or Consent of Instructor.

Components: LEC: Lecture

IMT 1161 (0.5 credit hours)**General Shop Knowledge Lab**

Includes the application of fundamental machining operations necessary for the success of Maintenance Technicians in the field who are required to be proficient in basic machining operations. Laboratory: 0.5 credit (15 contact hours).

Co-requisite: IMT 1151 or Consent of Instructor.

Co-requisite: : IMT 1165 or Consent of Instructor.

Components: LAB: Laboratory

IMT 1162 (0.5 credit hours)**Vertical and Horizontal Bandsaw Operations Lab**

Introduces vertical and horizontal bandsaw operations including the selection of feeds and speeds as well as blade welding. Laboratory: 0.5 credit (15 contact hours).

Co-requisite: IMT 1152 or Consent of Instructor.

Components: LAB: Laboratory

IMT 1163 (0.5 credit hours)**Drill Press Operations and Procedures Lab**

Introduces drill press operations including the selection of feeds and speeds, layout, drill bit selection and sharpening, and precision drilling operations. Laboratory: 0.5 credit (15 contact hours).

Co-requisite: IMT 1153 or Consent of Instructor.

Components: LAB: Laboratory

IMT 1164 (2 credit hours)**Lathe Operations and Procedures Lab**

Introduces lathe operations including lathe components, grinding tool bits, the selection of feeds and speeds, turning operations, and threading. Laboratory: 2 credits (60 contact hours).

Co-requisite: IMT 1154 or Consent of Instructor.

Components: LAB: Laboratory

IMT 1165 (1.5 credit hours)**Milling Machine and Surface Grinder Operations and Procedures Lab**

Introduces milling and surface grinding operations including vise alignment, tramping, selection of feeds and speeds, form tools, dressing grinding wheels. Laboratory: 1.5 credit (45 contact hours).

Pre-requisite: IMT 1161 or Consent of Instructor.

Co-requisite: IMT 1155 or Consent of Instructor.

Components: LAB: Laboratory

IMT 1381 (1 credit hours)**Safety Culture**

Introduces the importance of cultivating daily safe work habits and the predictable negative results of not being safety conscious in the work place. Instructs the students in basic safety culture and prepares them to participate in, conduct, and lead safety walk-throughs. Introduces the student to Kiken Yoshi Training (KYT) or Hazard Prediction Training. Prepares the student to conduct risk assessment activities, construct safety boards, and formulate individual safety commitments. Lecture: 1.0 credit (15 contact hours).

Components: LEC: Lecture

IMT 1382 (1 credit hours)**5S**

Introduces the fundamental 5S process involving the five step progression described by the Japanese words Seiri, Seiton, Seiso, Seiketsu, and Shitsuke. Instructs the students in the sequence involving classifying and sorting, ordering and aligning, cleaning and sweeping up, standardizing, and developing a process of sustainable practice in the workplace. Fosters the development of a workplace organization in which safety and efficiency are always paramount. Lecture: 1.0 credit (15 contact hours).

Components: LEC: Lecture

IMT 1383 (1 credit hours)**Total Production Management**

Instructs the student in the concepts of value-added product, maintenance value-added product, value-added work and necessary work. Explains the process of how Toyota earns profit. Demonstrates the Toyota Production System for Maintenance using the House framework. Describes and explains the three Ms and the seven Mudras and their relationship to maintenance and production. Lecture: 1.0 credit (15 contact hours).

Components: LEC: Lecture

IMT 1384 (1 credit hours)**Problem Solving**

Introduces the Toyota Business Practice model, the 8 step Toyota Problem Solving method, and the 10 part Toyota Drive and Dedication model. Instructs the students to clarify the problem, break it down to analyze it, set achievable targets, analyze the root cause, develop countermeasures, evaluate results and the process, standardize the results, and learn from failures. Fosters the development of a customer first philosophy involving all the stakeholders. Lecture: 1.0 credit (15 contact hours).

Components: LEC: Lecture

IMT 1385 (1 credit hours)**Maintenance Reliability**

Introduces the Toyota Maintenance Reliability training. Describes the difference between corrective maintenance and preventive maintenance. Breaks down proactive maintenance and the underlying tools and constituent processes. Instructs the students in the various individual units in a system and the steps in evaluating failure mode risks and countermeasures. Lecture: 1.0 credit (15 contact hours).

Components: LEC: Lecture

IMT 2201 (1 credit hours)**Introduction to Motor Controls**

Addresses the importance of electrical safety and the general fundamentals of motor controls. Lecture: 1 credit (15 contact hours).

Pre-requisite: (IMT 110 and IMT 111) or Consent of Instructor.

Co-requisite: IMT 2211.

Components: LEC: Lecture

IMT 2202 (1 credit hours)**Motor Starters and Pilot Devices**

Addresses the diversity of motor starters, control devices, and circuitry. Introduces the different types and operations of basic control circuits while reinforcing the common symbols used in motor control circuits as well as interpreting and drawing electrical schematics and wiring diagrams. Lecture: 1 credit (15 contact hours).

Pre-requisite: IMT 2201 or Consent of Instructor.

Co-requisite: IMT 2212.

Components: LEC: Lecture

IMT 2203 (1 credit hours)**Motor Control Circuits**

Explores aspects of electrical symbols and specialized motor control circuit. Lecture: 1 credit (15 contact hours).

Pre-requisite: IMT 2202 or Consent of Instructor.

Co-requisite: IMT 2213.

Components: LEC: Lecture

IMT 2212 (0.5 credit hours)**Motor Starters and Pilot Devices Lab**

Addresses the diversity of motor starters, control devices, and circuitry. Laboratory: 0.5 credit (15 contact hours).

Pre-requisite: IMT 2211 or Consent of Instructor.

Co-requisite: IMT 2202.

Components: LAB: Laboratory

IMT 2213 (1 credit hours)**Motor Control Circuits Lab**

Explores aspects of electrical symbols and specialized motor control circuits. Laboratory: 1.0 credit (30 contact hours).

Pre-requisite: IMT 2212 or Consent of Instructor.

Co-requisite: IMT 2203.

Components: LAB: Laboratory

IMT 2231 (0.5 credit hours)**Principles in Process Control and Automation Lab**

Provides the lab component for IMT 2221. Covers open and closed loop systems and how they relate to servo and motor encoders. Lecture: 0.5 credits (15 contact hours)

Pre-requisite: (IMT 110 and IMT 111) or Consent of Instructor.

Co-requisite: IMT 2221.

Components: LAB: Laboratory

IMT 2232 (0.5 credit hours)**Industry Standards for Control Circuit Wiring and Troubleshooting Methods Lab**

Provides the lab component for IMT 2222. Covers industry standards related to color coding of industrial wiring control cabinets. Provides for troubleshooting techniques using electrical hand tools and developing and interpreting troubleshooting flow charts to determine phase failure and voltage drops. Laboratory: 0.5 credits (15 contact hours)

Pre-requisite: (IMT 110 and IMT 111) or Consent of Instructor.

Co-requisite: IMT 2222.

Components: LAB: Laboratory

IMT 2233 (1 credit hours)**Industry Standards for Installing Motors/Electronic Variable Speed Drives II**

Provides the lab component for IMT 2223. Covers how to properly evaluate maintenance procedures used for installation of AC and DC motors, proper start up and shut down of electrical systems and fault recovery. Laboratory: 1 credit (30 contact hours).

Pre-requisite: (IMT 110 and IMT 111) or Consent of Instructor.

Co-requisite: IMT 2223.

Components: LAB: Laboratory

IMT 2601 (0.5 credit hours)**Stamping Press Basics**

Addresses press and production safety, various types of presses, and press operations. Lecture: 0.5. (Contact Hours 7.5).

Pre-requisite: (IMT 115 & IMT 116) or (MTT 114) or (MTT 110 & MTT 112)] or Consent of Instructor.

Components: LEC: Lecture

IMT 2602 (0.5 credit hours)**Stamping Die Basics**

Addresses the basics of stamping dies including the production of dies, die safety, rigging and setup of dies, die bolting and clamping, and OSHA die identification. Lecture: 0.3 credits (4.5 contact hours), Lab: 0.2 credits (6 contact hours).

Pre-requisite: IMT 2601 or Consent of Instructor.

Components: LEC: Lecture

IMT 2603 (1.3 credit hours)**Stamping Die Processes**

Addresses various stamping die processes such as bending, forming, drawing, squeezing, and coining. Lecture: 1.3 (Contact Hours 36).

Pre-requisite: IMT 2602 or Consent of Instructor.

Components: LEC: Lecture

IMT 2604 (0.6 credit hours)**Metallurgy of Die Components**

Addresses the characteristics of various tool and die steels, the properties of low carbon steels and cast iron, and die surface coatings and treatments. Lecture: 0.1 credits(1.5 Contact Hours), Lab: 0.5 credits (15 contact hours).

Pre-requisite: IMT 2603 or Consent of Instructor.

Components: LEC: Lecture

IMT 2605 (1.2 credit hours)**Anatomy of Stamping Dies**

Addresses pads and strippers, spring selection, and the characteristics of nitrogen die pressure systems. Lecture: 0.5 credits (7.5 contact hours).

Pre-requisite: IMT 2604 or Consent of Instructor.

Components: LEC: Lecture

IMT 2606 (1.3 credit hours)**Repair Decisions**

Addresses the process for die repair decisions, basic considerations needed when repairing dies, and the control of bend by adjusting pad pressure. Lecture: 1.3. (Contact Hours 34.5).

Pre-requisite: IMT 2605 or Consent of Instructor.

Components: LEC: Lecture

IMT 2607 (1.6 credit hours)**Die Repair**

Addresses the repair of dies including good grinding practice, repairing worn edges, performing shimming of die components, repairing forming ribs and embossments, performing electrical and welding repairs, performing hand finishing, and explaining the repair of nitrogen pressure systems. Lecture: 0.1 credits (1.5 contact hours), Lab: 1.5 credits (45 contact hours).

Pre-requisite: IMT 2606 or Consent of Instructor.

Components: LEC: Lecture

IMT 2801 (0.75 credit hours)**Introduction to Programmable Logic Controllers**

Provides an overview of Programmable Controllers, their hardware and functions. Lecture: 0.75 credit. (11.25 contact hours).

Pre-requisite: ((IMT 220 and IMT221 with a grade of "C" or greater) or (equivalent) or Consent of Instructor).

Co-requisite: IMT 2811 or Instructor Consent.

Components: LEC: Lecture

IMT 2802 (0.75 credit hours)**Programming Instructions in PLCs**

Provides an overview in programming Programmable Logic Controller Timers and Counters. Lecture: 0.75 credit (11.25 contact hours).

Co-requisite: IMT 2812 or Instructor Consent.

Components: LEC: Lecture

IMT 2803 (0.75 credit hours)**Number Systems and Data Manipulation in PLCs**

Includes different numbering systems, their transfer from one location to another, comparing, manipulation and common math instructions used in PLC. Lecture: 0.75 credit (11.25 contact hours).

Co-requisite: IMT 2813 or Instructor Consent.

Components: LEC: Lecture

IMT 2804 (0.75 credit hours)**Advanced Instructions and Troubleshooting PLCs**

Provides an understanding of control instructions, sequencers, shift registers, troubleshooting, and forcing inputs and outputs. Lecture: 0.75 credit (11.25 contact hours).

Co-requisite: IMT 2814 or Instructor Consent.

Components: LEC: Lecture

IMT 2811 (0.5 credit hours)**Introduction to Programmable Logic Controllers Lab**

Provides hands-on experience in programming and addressing basic instructions, internal relays, and latching relays. Includes changing modes of operation. Laboratory: 0.5 credit (15 contact hours).

Pre-requisite: ((IMT 220 and IMT221 with a grade of C or greater) or (equivalent) or Consent of Instructor).

Co-requisite: IMT 2801 or Instructor Consent.

Components: LAB: Laboratory

IMT 2812 (0.5 credit hours)**Programming Instructions in PLCs Lab**

Provides practical experience in programming Programmable Logic Controller Timers and Counters. Laboratory: 0.5 credit (15 contact hours).

Co-requisite: IMT 2802 or Instructor Consent.

Components: LAB: Laboratory

IMT 2813 (0.5 credit hours)**Number Systems and Data Manipulation in PLCs Lab**

Convert numbers systems, perform data manipulation, transfer, and comparison on the numbers as well as program math instructions.

Laboratory: 0.5 credit (15 contact hours).

Co-requisite: IMT 2803 or Instructor Consent.

Components: LAB: Laboratory

IMT 2814 (0.5 credit hours)**Advanced Instructions and Troubleshooting PLCs Lab**

Covers program control instructions, sequencers, and shift registers. Includes troubleshooting PLC issues and using the forcing command.

Laboratory: 0.5 credit (15 contact hours).

Co-requisite: IMT 2804 or Instructor Consent.

Components: LAB: Laboratory