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**Industrial Mechanic Program**

**Course Curriculum**

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| **Semester 01**   (Tuition: $2,780  Books: $280-$490) |
| **Course #** | **Course Title** | **Credits** |
| 10-620-101 | DC and AC Fundamentals | 5 |
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| Credits: 5 Lecture Hours: 54 Lab Hours: 72Students will explore and apply the principles of DC and AC electricity and components. Major topics of study include: electrical safety, direct current (DC) and its characteristics, resistors and resistance, electrical units of volts, ohms, amps, and watts and their relationships in series, parallel, and series-parallel circuits, test and measurement tools and techniques, circuit analysis using common electrical laws and theorems, alternating current (AC) and its characteristics, capacitors and inductors and the effects of inductance and capacitance in AC circuits. In addition, basic soldering/desoldering, breadboarding, and troubleshooting skills will be practiced. |
| 10-620-121 | Mechanics and Materials | 4 |
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| Credits: 4 Lecture Hours: 36 Lab Hours: 72Learners explore the basic concepts of simple mechanical drives and drive components. Major topics include: V-belt drives, chain drives, and gear drives. Learners install and align mechanical drive system components to specified tolerances using a variety of common and specialized hand tools and measuring instruments including dial calipers, micrometers, levels, and rules. |
| 10-620-124 | Welding for Maintenance | 2 |
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| Credits: 2 Lecture Hours: 9 Lab Hours: 54The student creates weldments in flat, vertical, horizontal, and overhead positions; these weldments will utilize SMAW, MIG, TIG, brazing and oxyfuel. All operations will adhere to AWS Code. |
| 10-620-143 | Advanced Welding for Maintenance | 2 |
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| Credits: 2 Lecture Hours: 9 Lab Hours: 54The students will create advanced weldments in flat, vertical, horizontal, and overhead positions. These weldments will utilize SMAW, MIG, TIG, brazing, and oxyfuel operations. All operations will adhere to AWS Code. |
| 10-620-160 | Industrial Safety Practices & Career Development | 1 |
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| Credits: 1 Lecture Hours: 18Students will gain an understanding of the OSHA regulations governing safety in the workplace. They will earn an OSHA 10-hour certification card upon successful completion of this course. Students will also be introduced to the ASME safe rigging practices to be applied to rigging applications in the field. Students discover employment strategies designed to assist in securing employment. The course will help develop an awareness of personal and academic skills as they relate to the job seeking process. |
| 10-804-113 | College Technical Math 1A | 3 |
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| Credits: 3 Lecture Hours: 54Topics include: solving linear equations; graphing; percent; proportions; measurement systems; computational geometry; and right triangle trigonometry. Emphasis will be on the application of skills to technical problems. Successful completion of College Technical Mathematics 1A and College Technical Mathematics 1B is the equivalent of College Technical Mathematics 1. |
|  |  | **17** |
| **Semester 02**   (Tuition: $2,650  Books: $280-$380) |
| **Course #** | **Course Title** | **Credits** |
| 10-620-107 | Hydraulics and Pneumatics | 3 |
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| Credits: 3 Lecture Hours: 27 Lab Hours: 54Students examine the principles of fluidic and pneumatic power. Students investigate the operation and applications of devices used in these systems along with the symbolic representation of these devices. Utilizing this information the student will build, analyze, and troubleshoot hydraulic and pneumatic circuits in a laboratory setting. Prerequisites: College Technical Math 1A (10-804-113) or College Technical Math 1 (10-804-115) |
| 10-620-130 | Machine Shop for Maintenance | 2 |
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| Credits: 2 Lecture Hours: 9 Lab Hours: 54The student sets up and operates engine lathes, cutoff saws, milling machines, and drill presses to fabricate projects according to blueprints provided and within tolerances specified. |
| 10-620-144 | Advanced Machine Shop for Maintenance | 2 |
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| Credits: 2 Lecture Hours: 9 Lab Hours: 54Students will perform advanced tasks on various types of manual mills, lathes, and other equipment commonly found in many Maintenance Departments. Students will select different metals based on hardness and application qualities. |
| 10-620-146 | Advanced Mechanical Drives | 3 |
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| Credits: 3 Lecture Hours: 27 Lab Hours: 54This course examines both preventive and predictive maintenance concepts as they apply to mechanical drive systems on industrial machines. Students will develop skills related to assessing machine conditions and equipment breakdowns using correct troubleshooting procedures. Students will also explore the electrical safety practices necessary to safely troubleshoot and perform preventative maintenance practices with a thermal image camera. Prerequisite: Mechanics and Materials (10-620-121) |
| 10-620-148 | Intro to Motor Controls | 2 |
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| Credits: 2 Lecture Hours: 18 Lab Hours: 36Students operate, install, and troubleshoot relay and variable frequency drive control of A/C electric motors found in industrial and commercial applications. Students will learn to develop and read schematics, including ladder logic, wire typical relay applications, test and monitor A/C electrical equipment and troubleshoot equipment as necessary. Prerequisite: DC and AC Fundamentals (10-620-101) |
| 10-620-149 | Intro to Programmable Controls | 2 |
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| Credits: 2 Lecture Hours: 18 Lab Hours: 36Students design, program, operate, and troubleshoot discrete input/ output PLC functions utilizing Allen Bradley Control Logix programming software. Students will develop ladder logic programs on a PC, transfer them to and from a PLC, and monitor PLC operations. Co-requisites: Machine Control I-A (10-620-127)or Intro to Motor Controls (10-620-148) |
| 10-804-114 | College Technical Math 1B | 2 |
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| Credits: 2 Lecture Hours: 36This course is a continuation of College Technical Mathematics 1A. Topics include: performing operations on polynomials; solving quadratic and rational equations; formula rearrangement; solving systems of equations; and oblique triangle trigonometry. Emphasis will be on the application of skills to technical problems. Successful completion of College Technical Mathematics 1A and College Technical Mathematics 1B is the equivalent of College Technical Mathematics 1. |
|  |  | **16** |
| **Total Credits: 33** |
| **Estimated Total Tuition: $5,430** |
| **Tools/Equipment: $200** |