Industrial Maintenance Technician

32-462-1 Technical Diploma

Financial Aid Eligible

Program Overview

The Industrial Maintenance Technician program will give the student practical, "hands-on" experience in welding, hydraulics, electricity, mechanical maintenance, maintenance machining, and PLC (programmable logic controller) equipment maintenance. Opportunities for advancement increase with further education.

Campus:

Superior

WISCONSIN INDIANHEAD TECHNICAL COLLEGE

Admission Requirements

Students in this program must:

- Complete application form and submit with fee (fee waiver may apply if previously submitted)
- Complete Accuplacer entrance assessment to determine placement (waiver may apply with acceptable alternative test scores and/or postsecondary degree completion)
- Complete admissions interview with a WITC counselor (above requirements should be completed prior to interview)

Student Profile

Industrial Maintenance Technician students should:

- Be able to apply mechanical principles and repair techniques
- Be able to use good judgment
- Be able to follow procedures carefully
- Be able to handle equipment skillfully
- Be able to assume responsibility
- Be able to work under pressure
- Be able to lift 50 pounds
- Be interested in mechanics
- Enjoy working with their hands
- Be able to organize tasks
- Be able to work well with others
- Be able to accept constructive criticism
- Be able to work well under supervision

Preparation for Admission

Students should strive to reach a comfort level in the following courses or skills:

- General mathematics
- Algebra
- Machine Shop
- Welding
- Science/Physics and Chemistry
- English/Communications
- Human Relations

Program Outcomes

Employers will expect Industrial Maintenance Technician graduates to be able to:

- Install, maintain, and troubleshoot industrial mechanical drive systems
- Install, maintain, and troubleshoot fluid power systems
- Install, maintain, and troubleshoot pumping sytems
- Install, maintain, and troubleshoot industrial electrical control systems
- Install, program, and troubleshoot process logic control systems
- Install, fabricate, and repair industrial equipment

Collegewide outcomes and indicators will also be addressed to develop personal awareness, career effectiveness, and professionalism. See page 5 for a list of collegewide outcomes and indicators.

Career Outlook

Maintenance mechanics are in demand in all types of industries. Pay rates for people in the equipment maintenance field are among the highest of all trades. Typical careers available after graduation include:

- Maintenance Technician Assistant
- Maintenance Technician Foreperson
- Maintenance Machinist
- Maintenance Technician
- Maintenance Welding

Graduates may also enter the trades of Machine Repair, Machine Rebuilder, and Millwright. Graduates may advance to such positions as Maintenance Leadperson, Maintenance or Millwright Apprentice, Foreperson, or Superintendent.

Curriculum

Number	Course Title	Credits
Occupational Specific Courses		
32414340	Basic Electrical Theory	2
32414341	Electrical Systems ▲	3
32414342	Electrical Motors ▲	2
32414343	Industrial Systems Control ▲	3
32419301	Hydraulics/Pneumatics	3
32420305	Maintenance Machining	3
32420310	Print Reading	2
32442341	Maintenance Welding	3
32462305	Rigging	2
32462306	Fabrication Processes	2
32462308	Piping Systems	2
32462309	Pump Applications	2
32462310	Valves, Gaskets, Seals	2
32462311	Fluid Systems Repair Lab (WBL) ▲	3
32462312	Bearings and Lubrication	2
32462313	Gears, Belts, and Chain Drives	2
32462314	Machine Leveling and Alignments	2
32462315	Conveyors (WBL)	3
32462316	Conveyor Systems Repair Lab ▲	3
32462317	Industrial Safety	1
32462318	Preventive Maintenance	2
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Occupational Supportive/ General Studies Courses ◗		
32801361	Applied Communications 1	2
32801363	Applied Communications 2 ▲	2
32804355	Math 355	3
32804364	Math 364 ▲	2
32806300	Applied Materials Science	2
32806351	Applied Science	2
32809371	Applied Human Relations	2
32890305	Applied Information Resources	2
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PROGRAM REQUIREMENTS		**66**

▲ Requires a prerequisite and/or corequisite that must be completed with a grade point of 2.0 or better.

◗ See page 40 for General Studies course descriptions.

Course Descriptions

(See page 40 for General Studies course descriptions)

32414340
Basic Electrical Theory - Credits: 2
This course is designed to introduce the student to the basic concepts of electricity. Students will be introduced to basic electrical components such as resistors, switches, indicators, relays, and basic testing equipment. Conduit bending, troubleshooting, and reading wiring or ladder diagrams will be introduced during this course.

32414341
Electrical Systems - Credits: 3
This course introduces the student to advanced interpretation of the various wiring and ladder diagrams used in electrical systems. The selection and application of interconnecting wiring and control devices used in industrial electrical control systems will be the focus of this course. COREQUISITE: 32414340 Basic Electrical Theory.

32414342
Electrical Motors - Credits: 2
This course is designed to introduce the student to single-phase, direct current, and three-phase motors. Motor selection, motor protection, and motor failure will also be covered in the course. Troubleshooting skills and wiring procedures will be demonstrated. COREQUISITE: 32414340 Basic Electrical Theory.

32414343
Industrial Systems Control - Credits: 3
This course is designed to introduce the student to the basics of the programmable logic controllers used in industry. Training in ladder logic, logic gates, Boolean equations, and truth tables will be given. Basic program and troubleshooting will be the focus of this course. COREQUISITE: 32414340 Basic Electrical Theory.

32419301
Hydraulics/Pneumatics - Credits: 3
This course is designed to introduce the student to the theory of fluid power. The common gas laws will be analyzed. The basic system of a hydraulic unit and pneumatic unit will be the focus of this laboratory-based course. Common applications of different circuits will be explored and constructed.

32420305
Maintenance Machining - Credits: 3
This course is designed to introduce the student to the basic machines and procedures of machines common to the industrial maintenance industry.

32420310
Print Reading - Credits: 2
This course will cover the basic principles of print reading. The emphasis will be on interpreting lines and symbols in single- and multiple-view working drawings. Topics include print reading procedures, sketching, drawing changes, and the reading of prints in maintenance areas of machining, fabrication, piping systems, and welding.

32442341
Maintenance Welding - Credits: 3
This course will introduce the student to the basic concepts of oxyfuel gas cutting principles, air carbon arc cutting, plasma arc cutting, shielded metal arc welding, and gas metal arc welding. This course is self-paced within the 16-week semester time frame; it is supported by DVD demonstrations, instructor demonstrations, and instructor-led theory.

32462305
Rigging - Credits: 2
During this course the student will be introduced to the safety procedures, the common hardware components, and the equipment used in industry for rigging to lift and move machines and equipment. The student will demonstrate industry standard rigging and lifting procedures in a laboratory-based environment.

32462306
Fabrication Processes - Credits: 2
This course is designed to introduce the student to the basics of fabrication processes that are common to the industrial maintenance field along with the tools and components used in these processes. This course is a theory-based course with hands-on lab applications.

32462308
Piping Systems - Credits: 2
This course is designed to introduce the student to basic plumbing of air, water, and other process systems found in industrial plants. Layout, cutting, threading, and installing these systems will be the focus of this course.

32462309
Pump Applications - Credits: 2
This course is designed to enable the student to explore the theory of fluid pumping applications common to industry. General troubleshooting and maintenance procedures will be stated and practiced during this competency lab-based course.

32462310
Valves, Gaskets, Seals - Credits: 2
This course is designed to introduce the student to the valves, gaskets, and seals that are common to industry. Basic theory and hands-on laboratory assignments will be the foundation of this course.

32462311
Fluid Systems Repair Lab (WBL) - Credits: 3
This course is designed to give the student a chance to apply fluid power system skills in a shop environment. Students will work on projects that will require troubleshooting of fluid systems and components, and construction of fluid systems common to industry. COREQUISITES: 32419301 Hydraulics/ Pneumatics, 32462308 Piping Systems, 32462309 Pump Applications, and 32462310 Valves, Gaskets, Seals.

32462312
Bearings and Lubrication - Credits: 2
This course is designed to introduce the student to the applications of bearings and lubrication processes used in industries. Instruction will be given in the basic principles of operations, preventive maintenance, and repair procedures of all bearing types common to industry.

32462313
Gears, Belts, and Chain Drives - Credits: 2
This course is designed to introduce the student to the applications of gears, belts, and chain drives used in industry. Instruction will be given in the basic principles of operation, installation, preventive maintenance, and repair procedures of these components to industry standards.

32462314
Machine Leveling and Alignments - Credits: 2
This course is designed to introduce the student to the standard applications of machine leveling and alignment of shafts, couplings, bearings, and machines common to industries. This course will cover several leveling and alignment procedures that meet industry standards.

32462315
Conveyors (WBL) - Credits: 3
This course is designed to introduce the student to bulk handling belt conveyor systems common to many industries. While examining the different systems used that make up an effective belt conveyor, the student will design a system of their own. Standard applications, preventive maintenance, repair, and installation of conveyors will be the focus of this course. The screw, flat belt, and roller conveyors will also be examined. A strong background in mechanical drive and fabrication is recommended.

32462316
Conveyor Systems Repair Lab - Credits: 3
This course is designed to provide a "real" work-like environment where the student is placed in a team environment to build a conveyor from the design that was created in the conveyors theory class. All welding, machining, and the fabrication of the conveyor will be done by the team. The ordering of parts and components, along with creating a journal of the project, will be a team function. COREQUISITE: 32462315 Conveyors (WBL).

32462317
Industrial Safety - Credits: 1
This course is designed to introduce the student to safety topics required by OSHA for general industries. Safety committees and their function in the workplace will also be discussed. The history of OSHA and the role it plays in industry, along with the roles of all workers and employers toward safety, will be the focus of this course.

32462318
Preventive Maintenance - Credits: 2
This course is designed to introduce the student to the theory of TPM and other preventive maintenance systems and software. In a team format, the students will design and create a preventive maintenance program for a given industry on real machinery. Basic knowledge of machine maintenance is recommended.

Gainful employment information is available at this link: **http://www.witc.edu/pgmpages/industmaint/career.htm**. This information is provided as a federal requirement in an effort to help students make informed decisions related to the costs and potential employment in a chosen field.

Graduate Employment Information

(WITC Graduate Survey Responses 2009-2010; for most recent data, go to **witc.edu**)

career vision

Number of graduates	10	Number employed	8	% employed in WITC district	14%
Number of responses	10	Percent employed	89%	Range of yearly salary	$31,198-$60,000
Number available for employment	9	Employed in related field	8	Average yearly salary	$48,064