Mechanical Techniques - Industrial Maintenance (Millwright)

Section B.146
9/22/2020

Ontario College Certificate (1 Year - 2 Semesters) (5082)

705.759.6700 : 1.800.461.2260 : www.saultcollege.ca : Sault Ste. Marie, ON, Canada

PROGRAM OVERVIEW

The Mechanical Techniques - Industrial Maintenance (Millwright) program is designed for individuals interested in pursuing a career in mechanical trades. It provides you with a solid foundation in mechanical skills and the hands-on aspects of the trade, including such things as blueprint reading, operating hoisting and lifting devices, and installing and troubleshooting various systems. As a graduate of this program, you will also gain practical skills in the use of shop equipment and precision-measuring instruments to support the production and repair of components in a mechanical environment. Industrial mechanics (millwrights) are often sought-after to work in manufacturing plants, with utilities, and other industrial organizations maintaining, repairing, and installing equipment.

PROGRAM OUTCOMES

A graduate of the Mechanical Techniques Program at Sault College will reliably demonstrate the ability to:

1. complete all work in compliance with current legislation, standards, regulations and guidelines.
2. contribute to the application of quality control and quality assurance procedures to meet organizational standards and requirements.
3. comply with current health and safety legislation, as well as organizational practices and procedures.
4. support sustainability best practices in workplaces.
5. use current and emerging technologies to support the implementation of mechanical and manufacturing projects.
6. troubleshoot and solve standard mechanical problems by applying mathematics and fundamentals of mechanics.
7. contribute to the interpretation and preparation of mechanical drawings and other related technical documents.
8. perform routine technical measurements accurately using appropriate instruments and equipment.
9. assist in manufacturing, assembling, maintaining and repairing mechanical components according to required specifications.
10. select, use and maintain machinery, tools and equipment for the installation, manufacturing and repair of basic mechanical components.

Reference

Ministry of Training, Colleges and Universities Mechanical Techniques Program Standards (MTCU 41007), September 2010.

ADMISSIONS

MINIMUM ACADEMIC REQUIREMENTS

Ontario Secondary School Diploma with Grade 12 English (C) ENG4C, and Grade 12 Foundations for College Math (C) MAP4C, or equivalent, or mature student status.

CAREER PATHS

As a graduate of this certificate program, you can work in entry-level positions in a broad range of employment settings in the manufacturing industry, in both large and small organizations. Industrial mechanics/millwrights work in manufacturing plants, utilities, and other industrial organizations maintaining, repairing and installing equipment.

You may also pursue further education or apprenticeship training. If you wish to pursue an apprenticeship, you should contact the local office of the Ministry of Colleges & Universities, Apprenticeship Branch at 705.945.6815.

Industrial Mechanic/Millwrights perform some or all of the following duties:

- Read blueprints, diagrams and schematic drawings.
- Install, align, dismantle and move stationary industrial machinery and mechanical equipment.
- Operate hoisting and lifting devices.
- Inspect and examine machinery and equipment to detect and investigate irregularities and malfunctions.
- Install, troubleshoot and maintain power transmission, vacuum, hydraulic and pneumatic systems.
- Adjust machinery and repair or replace defective parts.
- Operate machine tools such as lathes andmilling machinesto fabricate parts required during overhaul, maintenance or set-up of machinery.
- Clean, lubricate and perform other routine maintenance work on machinery.
- Assemble machinery and equipment prior to installation using hand and power tools and welding equipment.

MANDATORY FEES

Domestic		International	
Tuition	Ancillary	Tuition	Ancillary
$2,716.50	$1,017.00	$15,180.80	$1,477.00

These fees are for the 2020-2021 academic year (year 1 of study) and are subject to change. Please visit your Student Portal to view your Schedule of Fees.

OTHER INFORMATION

For more information contact Donovan Kennedy at 705.759.2554 ext. 2581 or email Donovan.Kennedy@saultcollege.ca.

PROGRAM OF STUDY

SEMESTER 1

CMM115-3 Communications I
DRF105-3 Drafting and Blueprint Reading
ENV102-3 Industrial Health and Safety
MCH121-3 Machine Shop Theory and Measurement
MCH134-2 Materials and Fasteners
MCH144-4 Machine Shop Practical I
MTH151-3 Mathematics
WLD121-2 Welding

SEMESTER 2
ELR111-1 Electric and Electronic Controls
GEN100-3 Global Citizenship
MCH141-3 Power Transmission Systems
MCH142-3 Pumps, Valves, Piping and Compressors
MCH145-4 Machine Shop Practical II
MCH244-4 Manufacturing Process
MCH253-2 Bearings, Seals and Lubrication
RIG101-2 Rigging and Hoisting

Course Descriptions

Semester 1

Communications I (CMM115) (3 credits)

This course is designed to help students develop the skills necessary to communicate effectively in their programs and at the college level. Students will think critically to capture the meaning messages and respond appropriately; produce coherent, clear paragraphs; and purposively research and responsibly integrate credible sources into their own writing. Emphasis is placed on the writing process, from planning to revising, while providing opportunities to explore various modes of communication.

Drafting and Blueprint Reading (DRF105) (3 credits)
In a hands-on environment students will learn blueprint reading, geometric dimensioning and tolerancing (G.D. & T.) and be introduced to AutoCAD. The course will commence with skill development in blueprint reading. These skills shall be applied to the machinist`s trade and related areas. New information has been added to explain computer-aided design, new dimensioning practices, and assembly drawing interpretation. Using common shop terminology, industrial prints will be interpreted. G.D. & T. includes reading dimensional drawings in fractions, decimals and in metric units. AutoCAD is taught so that upon completion students can create computerized, mechanical drawings.

Industrial Health and Safety (ENV102) (3 credits)
This is an introductory course for all those interested in industrial practices from the standpoint of industrial hygiene and industrial health and safety. Students will become familiar with pertinent legislation, industry and workers rights and responsibilities, recognition, evaluation and control methods and safe working practices.

Machine Shop Theory and Measurement (MCH121) (3 credits)

This course is designed to give the students an understanding of the theoretical aspects of machining and manufacturing including feeds, speeds, threading and gear cutting formulas. This course is also designed to strengthen the student`s ability to measure and inspect to precise tolerances. Tools using micrometer and vernier scales for linear and angular measurement will be used. There will be a basic introduction to Statistical Process Control (SPC), including interpretation and recording of data.

Materials and Fasteners (MCH134) (2 credits)

To provide students with a working knowledge of the theory behind the procedures that are used in the heat treating and machining of carbon steels, aluminum and its alloys. Practical lab/shop activities will be used to enhance and/or demonstrate theoretical concepts where possible.

Machine Shop Practical I (MCH144) (4 credits)
A study of shop machines, safety, and tool care, measurements and layout, bench work and hard tools, material identification, heat treatment and testing, basic lathe, saws, drill presses, shapers, grinder, and milling machine, theory and practices, speeds, feeds, tapers, threads.

Mathematics (MTH151) (3 credits)
In this course, emphasis will be placed on teaching mathematics at a level that will help the student in the Machining trade. Some theoretical concepts and topics in algebra, geometry and trigonometry will be covered. These concepts and topics will be reinforced by the use of practical problems to make the current topic relevant to the students` needs.

Welding (WLD121) (2 credits)
A trades curriculum that has been designed to provide students with a combination of theoretical knowledge and hands-on skill in relation to the safe use and operation of both OFG/SMA welding, cutting and heating equipment.

Semester 2

Electric and Electronic Controls (ELR111) (1 credits)
This course will provide students with the basic knowledge of electric and electronic theory. Students will learn about the purpose, scope of electrical codes, purpose and function of electrical components, selection and safe use of electrical instruments and electric and electron principles. They will also understand and be able to apply OHM`s law including units and relationships.

Global Citizenship (GEN100) (3 credits)
The world we are living in is one in which local, national and international issues are interwoven, and the need for us to understand the impact these issues can have on our lives has never been greater! Using a socio-cultural, political and environmental lens, students will view how the world is changing and how to become active agents of change from the local to international level. Important issues such as social injustice, poverty, environmental protection, resource scarcity, sustainability, and health will be addressed. Global citizenship is an opportunity to `Be the Change`. This course meets the Civic Life and Social and Cultural Understanding General Education themes.

Power Transmission Systems (MCH141) (3 credits)
A trades course designed to provide students with knowledge of power transmission systems such as belt drives, chains, gears, shafts and couplings.

Pumps, Valves, Piping and Compressors (MCH142) (3 credits)
In this course, the student will learn about the different applications, installation, maintenance and types of pumps, valves, piping, compressors and ancillary equipment.

Machine Shop Practical II (MCH145) (4 credits)
This course will continue to build on the study of shop machines, safety, and tool care, measurements and layout, bench work and hard tools, material identification, heat treatment and testing, basic lathe, saws, drill presses, grinder, and milling machine, theory and practices, speeds, feeds, tapers, and threads.

Manufacturing Process (MCH244) (4 credits)
A job planning course to cover shop organization costing, routing and scheduling, various processes as to viability and methods including foundry processes, hard mould casting, die casting, plastics and rubbers, primary metal working, welding, forging and comparisons as to quality, economics and feasibility.

Bearings, Seals and Lubrication (MCH253) (2 credits)
Students will learn about selecting, installing and maintaining friction/plain and rolling element bearings and static and dynamic seals. They will learn to interpret ISO charts and bearing catalogues. Students will also learn about bearing lubricants and their proper application.

Rigging and Hoisting (RIG101) (2 credits)
This course is designed to provide the student with the knowledge and understanding of correct lifting and hoisting procedures and the safe use of all equipment.