



CONESTOGA

Connect Life and Learning

## Mechanical Technician Co-op Diploma Apprenticeship Programs

General Machinist, Tool and Die, Machine Tool Builder Integrator  
and Industrial Mechanic Millwright

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### **About The Program**

The students/apprentices are registered to a consortium of industry on day one of the program as an apprentice and begin extensive training in this integrated apprenticeship model. The students/apprentice has met the in-school requirements of the common core level of apprenticeship upon completion of the first two semesters. At the end of semester two, the students/apprentices will begin to specialize in one of the trade streams and take a number of enhanced courses specific to the trade area they are registered in to prepare for their co-op placement. After their co-op term, students/apprentices return for their final 20 week in-school semester and will complete the final requirements of the in-school portion.

### **About Co-op**

With assistance from the co-op office students/apprentices work to secure a work term (August 2006-September 2007) for up to 56 weeks of employment, still as a registered apprentice to the consortium. This will allow the opportunity to gain the on-the-job competencies and have their employer sign them off in some of their competencies for their training standards (log book).

### **For More Information**

Visit our website for further information on the above co-op programs and to post an opportunity on-line <http://www.conestogac.on.ca/jsp/coop/contents.jsp>

Or call: Sonja Roy-Smith  
Conestoga College  
Institute of Technology and Advanced Learning  
Phone: (519) 748-5220 ext. 3624  
Email: [sroy-smith@conestogac.on.ca](mailto:sroy-smith@conestogac.on.ca)

## Academic and Co-op Work Term Schedule - School of Trades and Apprenticeship

# Mechanical Technician Apprenticeship – Co-op Diploma - Industrial Mechanic (Millwright)

This standardized Ontario program offers a unique experience to concurrently complete an apprenticeship in-school curriculum, an apprenticeship co-op experience and a Mechanical Technician Diploma, while offering the versatility of multiple entry and exit points.

The program presents an individual with opportunities to pursue highly skilled occupations in demand by maintenance industry industries. There are two in-school and one paid work placements sessions.

### Program Courses

#### Level One

Effective Technical Communications I  
Computer Applications  
Blueprint Reading I  
Electrical Phase I  
Millwright Theory I  
Millwright Practical I  
Welding I

#### Level Two

Electrical Phase II  
Workplace Preparation  
Applied Technical Mathematics I  
Millwright Theory II  
Millwright Practical II  
Science Fundamentals  
Welding II

#### Level Three

Blueprint Reading II  
Generic CAD (2D)  
Pneumatics  
Health and Safety  
Millwright Theory III  
Millwright Practical III

#### Level Four, Five & Six – Work Term 56 Weeks Entrepreneurship\*

Elective: Liberal Studies\*  
(\*Classes are completed by Distance through Continuing Education)

#### Level Seven

Electrical/PLC Phase III  
Hydraulics  
Applied Technical Mathematics II  
Millwright Theory IV  
Millwright Practical IV  
Trade Science  
Welding/Fabrication

### Mechanical Technician Apprenticeship – Industrial Mechanic (Millwright) Work/Study Sequence

	Fall (Sept. - Dec.)	Winter (Jan. - Apr.)	Spring/Summer (May- Aug.)
Year 1	Classes	Classes	Classes
Year 2	Workplace Based Co-op: 56 weeks		
Year 3	Classes (20 weeks)		

### Work Term Capabilities

Aug 2005 - Sept 2006

- Produce at rate comparable with a year 2 Apprentice in all aspects of machining including saws, hand tools, drilling machines, lathes, milling machines, surface grinders
- Identify the physical, chemical and mechanical properties and describe the identification systems and heat treatment process of ferrous, non-ferrous and non-metallic components
- Read and interpret engineering drawings and schematics. Sketch assembly and component parts
- Use applied technical math to solve shop related in both the Imperial system (Inch) and Systems International (Metric)
- Able to use both simple and complex measuring equipment to inspect, check and manufacture components in terms of size, surface quality, mechanical properties and conformance.
- Select cutting tool materials to meet required applications, analyze and optimize cutting conditions.
- Interpret reference materials charts and tables used in manufacturing environments.

- Familiar with Windows software including word processing, spreadsheets, presentation and research capabilities
- Produce detail / assembly drawings using AutoCAD
- In depth theoretical knowledge and practical experience to perform in a fast paced manufacturing or industrial environment
- Familiar with generic WHMIS, lock-out and tag-out, shop hazards and fire emergency procedures
- Complete welding and fabrication projects from drawings and instruction sheets
- Use the basic principles and applications of pneumatics and compressed air safety as it relates to pneumatic systems. Also identify, select and install pipe systems and valves for specific applications
- Knowledge of the basic hydraulic principles and the ability to perform pertinent hydraulic calculations

#### SAMPLE JOB TITLES:

- Apprentice Industrial Mechanic (Millwright)

## Academic and Co-op Work Term Schedule - School of Trades and Apprenticeship

# Mechanical Technician Apprenticeship – Tool and Die/Tool Maker, General Machinist or Machine Tool Builder Integrator

This standardized Ontario program offers a unique experience to concurrently complete an apprenticeship in-school curriculum, an apprenticeship co-op experience and a Mechanical Technician Diploma, while offering the versatility of multiple entry and exit points. The first two semesters are common to all trades; the student/apprentices are streamed in the 3rd semester for trade specific courses of study. The program presents an individual with opportunities to pursue highly skilled occupations in demand by the precision machining and tool industries. There are two in-school and one paid work placements sessions.

### Program Courses

#### Level One

Computer Applications  
 Mechanical Engineering Drawings I  
 Applied Metallurgy and Materials  
 Precision Machining Theory and Practice I  
 Metrology I  
 Applied Technical Mathematics I

#### Level Two

Mechanical Engineering Drawings II  
 Generic CAD (2D)  
 Workplace Preparation  
 Precision Machining Theory and Practice II  
 CNC Manual Programming I  
 Applied Technical Mathematics II

#### Level Three – All

Material Cutting Technology  
 CNC Manual Programming II  
 Health and Safety (CPR, First Aid)  
 Level Three - General Machinist  
 Precision Machining Theory and Practice III  
 Jig and Fixture Design Technology  
 Level Three - Machine Tool Builder Integrator  
 In-Process Tooling Technology: Theory & Practice I  
 Metrology II  
 Machine Tool Power Transmission Technology  
 Fluid Power  
 Machine Tool Electrical Basics  
 Level Three - Tool and Die/Tool Maker  
 Tool Making Techniques  
 Jig and Fixture Design Technology  
 Metrology II  
 Fluid Power

#### Level Four, Five & Six – Work Term

56 Weeks (August 2005)

Entrepreneurship\*  
 Elective: Liberal Studies\*  
 (\*Classes may be completed by Distance through Continuing Education)

#### Level Seven – All

CAD CAM Applications  
 CAD Solid Modeling I  
 Quality Control and Assurance  
 Level Seven - General Machinist  
 Precision Machining Theory and Practice IV  
 General Machinist Metrology  
 Level Seven - Machine Tool Builder Integrator  
 Machine Building Theory  
 PLC Fundamentals  
 In-Process Tooling Technology: Theory and Practice II  
 Level Seven - Tool and Die/Tool Maker  
 Die Design Techniques I  
 Die Making Techniques

### Mechanical Technician Apprenticeship – Industrial Mechanic (Millwright) Work/Study Sequence

	Fall (Sept. - Dec.)	Winter (Jan. - Apr.)	Spring/Summer (May- Aug.)
<b>Year 1</b>	Classes (15 wks)	Classes (15 wks)	Classes (15 wks)
<b>Year 2</b>	Workplace Based Co-op (56 weeks)		
<b>Year 3</b>	Classes (20 weeks)		

### Work Term Capabilities

Aug 2005 - Sept 2006

- Produce at rate comparable with a year 2 Apprentice in all aspects of machining including saws, hand tools, drilling machines, lathes, milling machines, surface and cylindrical grinders
- Identify the physical, chemical and mechanical properties and describe the identification systems and heat treatment processes of ferrous, non-ferrous and non-metallic components
- Interpret and work off of conventional and G.D. & T mechanical engineering drawings
- Use applied technical math to solve shop related problems in both the Imperial system (Inch) and Systems International (Metric)
- Able to use both simple and complex measuring equipment to inspect, check and manufacture components in terms of size, surface quality, mechanical properties and conformance
- Familiar with Windows software including word processing, spreadsheets, presentation and research capabilities
- Interpret reference materials charts and tables used in manufacturing environments

- Produce detail / assembly drawings using AutoCAD
- Set-up and operate CNC machining centres and CNC turning centres as well as basic programming using FANUC G-code programming
- Select cutting tool materials to meet required applications, analyze and optimize cutting conditions
- Understand capabilities and processes associated with Electrical Discharge Machining (EDM)
- Dependent on the trade stream, in depth theoretical knowledge and practical experience to perform in a fast paced manufacturing environment
- Certified in Emergency First Aid and certified in CPR
- Familiar with generic WHMIS, lock-out and tag-out, shop hazards and fire emergency procedures

Sample Job Titles:

- Apprentice Tool and Die/Tool Maker
- Apprentice General Machinist
- Apprentice Machine Tool Builder Integrator