Please Note: Apprenticeship Training and Curriculum Standards were developed by the Ministry of Training, Colleges and Universities (MTCU). As of April 8th, 2013, the Ontario College of Trades (College) has become responsible for the development and maintenance of these standards. The College is carrying over existing standards without any changes.

However, because the Apprenticeship Training and Curriculum Standards documents were developed under either the Trades Qualification and Apprenticeship Act (TQAA) or the Apprenticeship and Certification Act, 1998 (ACA), the definitions contained in these documents may no longer be accurate and may not be reflective of the Ontario College of Trades and Apprenticeship Act, 2009 (OCTAA) as the new trades legislation in the province. The College will update these definitions in the future.

Meanwhile, please refer to the College’s website (http://www.collegeoftrades.ca) for the most accurate and up-to-date information about the College. For information on OCTAA and its regulations, please visit: http://www.collegeoftrades.ca/about/legislation-and-regulations
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SKILL SETS

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APPRENTICESHIP PROGRAM SUMMARY/GUIDELINES

1. **Program Definition:** **General Machinist** is defined as a person who,
   - reads and interprets complex engineering drawings and work-process documentation;
   - cuts, shapes, and finishes metal to make machine precision machining parts and components;
   - sets up and operates conventional and numerically controlled metal-cutting machines and equipment including saws, drills, grinders, lathes, and mills;
   - performs work-in-process measuring or checking using specialized and precision tools and equipment

**GENERAL MACHINIST** is an approved apprenticeship program for the purposes of the Apprenticeship and Certification Act, 1998 (ACA).

2. **Program Guidelines**
   - **On-The-Job Train Duration (for apprentices)**
     The Industry Committee has identified 7,280 hours as the duration generally necessary for any apprentice to become competent in the skills required. There may be individual circumstances where the duration varies from this guideline.

   - **In-School Training Duration**
     The Industry Committee has identified 720 hours of in-school training as the duration generally necessary for an apprentice to complete the in-school curriculum for this program, except where an apprentice has been exempted from any level of that curriculum.

   - **Ratio**
     The Industry Committee has identified a journeyperson-to-apprentice ratio of one journeyperson or individuals who are deemed equivalent to a journeyperson status to one apprentice as the ratio generally necessary for an apprentice to be properly trained on the job in this program. There may be individual circumstances where the ratio varies from this guideline.
3. **Program Requirements**

- **Restricted Skill Sets**
  This program does not contain any restricted skill sets as per Ontario Regulation 565/99, Restricted Skill Sets. Therefore, an individual is not required to be registered apprentice or possess certification in order to perform skills contained in the program.

- **Academic Standard**
  The Industry Committee has identified the minimum academic standard for entry to this program as completion of Grade 12 or ministry-approved equivalent.
  
  (See ACA Policy 102, Confirming Academic Requirements)

- **Eligibility for Exam Challenge (for Non-apprentice C of Q Applicants)**
  The challenger must:
  - provide proof of competency in all mandatory (unshaded) skills as identified in the Training Standard or Schedule of Training; and
  - demonstrate that he/she has acquired 8,000 hours of on-the-job training.
  
  (See ACA Policy 150, Assessing Applicants for the Certificate of Qualification)

- **Eligibility for Program Completion (for Apprentices)**
  The apprentice must:
  - achieve competency in all mandatory (unshaded) skills as identified in the Training Standard or Schedule of Training.
  - complete the in-school training as outlined in the industry and ministry-approved Curriculum Standard.
  
  (ACA Policy 309, Completion of an Apprenticeship Program)

- **Other Information**

- **Other Resources**
  Complete program requirements, policies, and standards can be obtained by referring to the following resources:
  - *Apprenticeship and Certification Act, 1998 (ACA)*;
  - ACA General Regulation 573/99;
  - ACA Exemption Regulation 566/99;
  - Program-specific Apprenticeship Training Standards or Schedules of Training; and
  - ACA Program and Policy Manual
- **Other Required Certification**
  N/A

- **Academic Background**
  Industry has identified relevant secondary school course(s) likely to increase an individual’s chances of success if completed prior to program entry. For details, see the document Apprenticeship Subject Pathways.
## COMPETENCY ANALYSIS PROFILE

**GENERAL MACHINIST – 429A**

*(All unshaded skill sets must be demonstrated/completed)*

<table>
<thead>
<tr>
<th>SKILL SETS</th>
<th>SKILLS</th>
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</thead>
<tbody>
<tr>
<td><strong>PROTECT SELF AND</strong></td>
<td><strong>SKILLS</strong></td>
</tr>
<tr>
<td><strong>OTHERS</strong></td>
<td>Identify health and safety hazards.</td>
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<tr>
<td>5230.0</td>
<td>Wear, adjust, and maintain personal</td>
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<td>protective equipment.</td>
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<td></td>
<td>Wear, adjust, and maintain respiratory</td>
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<td>protectors.</td>
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<td>5230.02</td>
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<td>Practise safe work habits.</td>
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<td>5230.03</td>
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<td>Follow fire procedures.</td>
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<td>5230.04</td>
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<td>Operate emergency safety equipment.</td>
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<td>5230.05</td>
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<td>Practise industrial hygiene.</td>
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<td>5230.06</td>
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<td>Practise good housekeeping in the workplace.</td>
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<td>5230.07</td>
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<td>Conduct pre-operational check of</td>
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<tr>
<td></td>
<td>equipment.</td>
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<td>5230.08</td>
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<td>Report injuries.</td>
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<td>5230.09</td>
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<td>Follow procedures for applying first aid.</td>
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<td>5230.10</td>
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<td>Lock out mechanical equipment.</td>
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<td>5230.11</td>
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<td>Handle designated substances.</td>
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<td>Operate lifting equipment.</td>
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<td>5230.14</td>
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</tbody>
</table>
## GENERAL MACHINIST

### PLAN AND PREPARE FOR MACHINING JOB

<table>
<thead>
<tr>
<th>5231.0</th>
<th>Read and interpret engineering drawings.</th>
<th>Perform calculations for machining operations.</th>
<th>Read and interpret work-process documentation.</th>
<th>Verify workpiece material.</th>
<th>Identify and select cutting fluids.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5231.01</td>
<td>5231.02</td>
<td>5231.03</td>
<td>5231.04</td>
<td>5231.05</td>
<td></td>
</tr>
<tr>
<td>Identify and select machines.</td>
<td>Identify and check machine controls and systems.</td>
<td>Identify and select tooling.</td>
<td>Identify and prepare cutting tools.</td>
<td>Identify and select measuring instruments and checking devices.</td>
<td></td>
</tr>
<tr>
<td>5231.06</td>
<td>5231.07</td>
<td>5231.08</td>
<td>5231.09</td>
<td>5231.10</td>
<td></td>
</tr>
<tr>
<td>Select machine speeds and feeds.</td>
<td>Lay out features of engineering drawings.</td>
<td>Identify and select work-holding devices.</td>
<td>Pick up datum/starting position.</td>
<td>Identify and select lifting and rigging equipment.</td>
<td></td>
</tr>
<tr>
<td>5231.11</td>
<td>5231.12</td>
<td>5231.13</td>
<td>5231.14</td>
<td>5231.15</td>
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</tr>
<tr>
<td>Communicate with co-workers.</td>
<td></td>
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<tr>
<td>5231.16</td>
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### PERFORM WORK-IN-PROCESS DIMENSIONAL OR SURFACE VERIFICATION

<table>
<thead>
<tr>
<th>5232.0</th>
<th>Check straight cuts.</th>
<th>Check shapes.</th>
<th>Check threads.</th>
<th>Check holes.</th>
<th>Check tapers.</th>
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<tbody>
<tr>
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<td>5232.02</td>
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<td>5232.08</td>
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<tr>
<td>Complete work documentation.</td>
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<tr>
<td>5232.11</td>
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### GENERAL MACHINIST

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<td>5234.12</td>
<td>5234.13</td>
<td>5234.14</td>
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</tr>
<tr>
<td>PERFORM DRILLING USING DRILL PRESS/MACHINE</td>
<td>5235.0</td>
<td>Select drill tooling.</td>
<td>Identify and prepare cutting tools for drills.</td>
<td>Locate and position workpiece in drill.</td>
<td>Set up tooling in drills.</td>
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<td>5235.07</td>
<td>5235.09</td>
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</tr>
<tr>
<td>Spot-face a hole.</td>
<td>Counter-bore a hole.</td>
<td>Counter-sink a hole.</td>
<td>Maintain material identification.</td>
<td>Deburr workpiece.</td>
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<tr>
<td>5235.11</td>
<td>5235.12</td>
<td>5235.13</td>
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<td>5235.16</td>
<td>5235.17</td>
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<td>5235.19</td>
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<thead>
<tr>
<th>PERFORM MACHINE GRINDING</th>
<th>5236.0</th>
<th>Select grinding wheel.</th>
<th>Check condition of grinding wheel.</th>
<th>Install grinding wheel.</th>
<th>Locate and position workpiece in grinder.</th>
<th>Surface grind workpiece.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5236.01</td>
<td>5236.02</td>
<td>5236.03</td>
<td>5236.04</td>
<td>5236.04</td>
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<tr>
<td>Hone holes</td>
<td>Lap workpiece</td>
<td>Grind inside and outside diameters, (ID/OD)</td>
<td>Grind tools and cutters.</td>
<td>Check ground surfaces.</td>
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<tr>
<td>5236.05</td>
<td>5236.06</td>
<td>5236.07</td>
<td>5236.08</td>
<td>5236.10</td>
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<tr>
<td>Perform final inspection.</td>
<td>Move workpiece.</td>
<td>Complete work documentation.</td>
<td>Practise good housekeeping</td>
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<tr>
<td>5236.11</td>
<td>5236.13</td>
<td>5236.14</td>
<td>5236.15</td>
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<tr>
<td><strong>PERFORM LATHE WORK</strong></td>
<td>5237.0</td>
<td>5237.01</td>
<td>5237.02</td>
<td>5237.03</td>
<td>5237.04</td>
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<tr>
<td>Select lathe cutting tools.</td>
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<tr>
<td>Identify and prepare lathe cutting tools.</td>
<td>5237.06</td>
<td>5237.07</td>
<td>5237.08</td>
<td>5237.09</td>
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<tr>
<td>Locate and position workpiece in lathe.</td>
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<td>Set up lathe cutting tools.</td>
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<tr>
<td>Select speeds and feeds of lathe.</td>
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<tr>
<td>Take a sizing (preliminary) cut.</td>
<td>5237.11</td>
<td>5237.12</td>
<td>5237.13</td>
<td>5237.14</td>
<td>5237.15</td>
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<td>Establish a reference or starting point (datum)</td>
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<td>Face a surface.</td>
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<tr>
<td>Turn an external diameter.</td>
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<tr>
<td>Drill a hole.</td>
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<tr>
<td>Bore an internal diameter.</td>
<td>5237.16</td>
<td>5237.17</td>
<td>5237.18</td>
<td>5237.19</td>
<td>5237.20</td>
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<tr>
<td>Ream a hole.</td>
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<tr>
<td>Tap a hole.</td>
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<tr>
<td>Turn an internal or external thread.</td>
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<tr>
<td>Produce a taper.</td>
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<tr>
<td>Knurl cylindrical surface patterns.</td>
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<tr>
<td>Groove and part-off.</td>
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<tr>
<td>Maintain material identification.</td>
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<tr>
<td>Deburr workpiece.</td>
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<tr>
<td>Perform final inspection.</td>
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<tr>
<td>Complete work documentation.</td>
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<tr>
<td>Move workpiece.</td>
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<tr>
<td>Practise good housekeeping.</td>
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<tr>
<td>Deburn workpiece.</td>
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<tr>
<td>Perform final inspection.</td>
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<tr>
<td>Complete work documentation.</td>
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<tr>
<td>PERFORM MILLING</td>
<td>5238.0</td>
<td>Select milling cutting tools.</td>
<td>5238.01</td>
<td>Identify and prepare milling cutting tools.</td>
<td>5238.02</td>
<td>Set-up and maintain milling adjustable support tools.</td>
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<td></td>
<td>5238.06</td>
<td>Perform fly-cutting.</td>
<td></td>
<td>Face-mill.</td>
<td>5238.07</td>
<td>Machine steps, cut-outs, angles, and open slots.</td>
</tr>
<tr>
<td></td>
<td>5238.11</td>
<td>Bore holes.</td>
<td></td>
<td>Maintain material identification.</td>
<td>5238.12</td>
<td>Deburr workpiece.</td>
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<tr>
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<td>5238.16</td>
<td>Complete work documentation.</td>
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<td>Practise good housekeeping.</td>
<td>5238.17</td>
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<table>
<thead>
<tr>
<th>5239.0</th>
<th>Identify and select numerically controlled machining process.</th>
<th>5239.01</th>
<th>Identify, select, and set machine parameters.</th>
<th>5239.02</th>
<th>Position and align workpiece in NC/CNC machine.</th>
<th>5239.03</th>
<th>Input and process tool path and calculate coordinates.</th>
<th>5239.04</th>
<th>Determine tooling and set up NC/CNC cutting tools and tooling.</th>
<th>5239.05</th>
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<tbody>
<tr>
<td>5239.06</td>
<td>Set up NC/CNC cutting tools.</td>
<td>5239.07</td>
<td>Prepare NC/CNC set-up sheet.</td>
<td>5239.11</td>
<td>Monitor NC/CNC machining process.</td>
<td>5239.12</td>
<td>Complete work documentation.</td>
<td>5239.13</td>
<td>Practise good housekeeping.</td>
<td>5239.14</td>
</tr>
<tr>
<td>5239.11</td>
<td>Verify tool sequence, tool path, and collision avoidance program.</td>
<td>5239.11</td>
<td>Identify, select, and set machine parameters.</td>
<td>5239.15</td>
<td>Maintain material identification.</td>
<td>5239.16</td>
<td>Complete work documentation.</td>
<td>5239.17</td>
<td>Practise good housekeeping.</td>
<td>5239.18</td>
</tr>
<tr>
<td>5239.16</td>
<td>Move workpiece.</td>
<td>5239.17</td>
<td>Input and process program data to machine memory.</td>
<td>5239.18</td>
<td>Make adjustments to tooling and offsets.</td>
<td>5239.19</td>
<td>Identify, select, and set up NC/CNC cutting tools and tooling.</td>
<td>5239.19</td>
<td>Maintain material identification.</td>
<td>5239.20</td>
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</tbody>
</table>
PREFACE

This training standard was developed by the Workplace Training Branch of the Ministry of Training, Colleges, and Universities (MTCU), in partnership with the Industry Committees and in consultation with representatives from the industry. This document is intended to be used by apprentice, supervisor/trainer and sponsor/employer as a "blueprint" for training and as a prerequisite for completion and certification.

This training document becomes the apprentice’s only record of workplace training performance.

Supervisor/trainer and apprentice are required to sign off and date the skills following each successful acquisition, unless a skill is marked shaded (optional).

The care and maintenance of this training document are the joint responsibility of the apprentice and the sponsor/employer. By signing off the skill, the supervisor/trainer and the apprentice are indicating that the apprentice has demonstrated competence of the skill. This training standard has been developed specifically for documenting the apprentice’s acquisition of skills of the trade.
DEFINITIONS

ACA
Apprenticeship and Certification Act, 1998

Certificate of Apprenticeship (CofA)
Certification issued to individuals who have demonstrated that they have completed an apprenticeship in Ontario.

Certificate of Qualification (CofQ)
Certification issued to C of Q applicants who have achieved a passing grade on the certification exam for their trade.

Competency Analysis Profile
A document that identifies the training needs of an individual trade and details the skills/skill sets that must be demonstrated.

Competence
The ability of an individual to perform a skill repeatedly and without assistance in the workplace to the standard set out in the Training Standard or Schedule of Training.

General Performance Objective (On-the-job Skill Set)
Describes set of skills which include all performance objectives under that skill set.

Industry Committee (IC) - under the ACA and Provincial Advisory Committee (PAC) under the TQAA
Under the ACA and TQAA, the Minister may appoint a provincial committee in any trade or group of trades to advise the Minister in matters relating to the establishment and operation of apprenticeship training programs and trades qualifications.

Journeyperson or Equivalent
A person who has acquired the knowledge and skills in a trade, occupation or craft as attested to by a provincial or territorial authority.

Mandatory
Status assigned to unshaded individual skills, skill sets or general performance objective which must be signed off for the apprentice to complete their program.

Optional
Status assigned to shaded individual skills, skills sets or general performance objective for which sign-off is not required for the apprentice to complete the program.

Sign-off
Signature of the sponsor/employer of record or an individual to whom that sponsor or employer has delegated signing authority, indicating an apprentice’s achievement of competence.
Skill
Individual skill described in the Training Standard (note: does not mean the larger skill groups referred to in the Training Standard as Skill Sets, Training Units, or General Performance Objective, but the individual skills that make up those groups).

Skill Sets
Group of individual skills found in the Training Standard (may also be called Training Unit or General Performance Objective)

Skill Set Completion Form
Lists all skill sets and includes space for sign-off by sponsor/employer of record.

Sponsor/Employer
Means a person that has entered into a registered training agreement under which the person is required to ensure that an individual is provided with workplace-based training in a trade, other occupation or skill set as part of an apprenticeship program approved by the Director.

Sponsor/Employer of Record
Refers to the sponsor or employer documented as the signatory to the current training agreement or contract. In order for a sponsor/employer to be considered for the training of apprentices, they must identify that the workplace has qualified journeypersons or equivalent on site and can identify that the workplace has the tools, equipment, materials, and processes which have been identified by Provincial Advisory Committees (PACs) or Industry Committees (ICs) to be required for the trade.

Supervisor
An individual who oversees the execution of a task; oversees the actions or work of others.

Trainer
A qualified trainer in a compulsory trade is a journeyperson with a Certificate of Qualification or in a voluntary trade is an individual who is considered equivalent to a journeyperson with a Certificate of Qualification.

TQAA
Trades Qualification and Apprenticeship Act.

Training Standard
A document that has been written in concise statements, which describe how well an apprentice must perform each skill in order to become competent. In using the document, trainers will be able to ensure that the apprentice is developing skills detailed for the occupation.
IMPORTANT DIRECTIONS

Apprentice

1. All complete skills or skill sets must be signed and dated by both the apprentice and sponsor/employer when either all terms of the contract have been completed or the apprentice leaves the employ of the employer.

2. It is the responsibility of the apprentice to inform the local Apprenticeship Client Services Office regarding the following changes:
   - change of sponsor/employer address;
   - change of apprentice name or address;
   - transfer to a new sponsor/employer.

3. The Skill Set Completion Form must be completed and signed by the current sponsor/employer and presented to the local Apprenticeship Client Services Office at the fulfillment of all terms of a Contract of Apprenticeship/Training Agreement.

4. The apprentice completion form with the Completed and Authorized Training Standard must be presented to the local Apprenticeship Client Services Unit.

Sponsors/Employers and Supervisors/Trainees

The Training Standard identifies skills required for this trade/occupation and its related training program.

This Training Standard has been written in concise statements which describe how an apprentice must perform each skill in order to become competent. Competence means being able to perform the task to the required standard.

In using this Training Standard, supervisors/trainers will be able to ensure that the apprentice is developing the skills detailed for the trade/occupation.

Supervisors/Trainees and apprentices are required to sign off and date the skills following each successful acquisition.

Sponsors/Employers participating in this training program will be designated as the Signing Authority and are required to attest to successful achievement by signing the appropriate box included at the end of each skill set.
NOTICE OF COLLECTION OF PERSONAL INFORMATION

1. At any time during your apprenticeship training, you may be required to show this training standard to the Ministry of Training, Colleges and Universities (the Ministry). You will be required to disclose the signed Apprenticeship Completion form to the Ministry in order to complete your program. The Ministry will use your personal information to administer and finance Ontario’s apprenticeship training system, including confirming your completion and issuing your certificate of apprenticeship.

2. The Ministry will disclose information about your program completion and your certificate of apprenticeship to the Ontario College of Trades, as it is necessary for the College to carry out its responsibilities.

3. Your personal information is collected, used and disclosed by the Ministry under the authority of the Ontario College of Trades and Apprenticeship Act, 2009.

4. Questions about the collection, use and disclosure of your personal information by the Ministry may be addressed to the:

Manager, Employment Ontario Contact Centre
Ministry of Training, Colleges and Universities
33 Bloor St. E, 2nd floor, Toronto, Ontario M7A 2S3
Toll-free: 1-800-387-5656; Toronto: 416-326-5656
ROLES & RESPONSIBILITIES OF APPRENTICE, SPONSOR/EMPLOYER AND SUPERVISOR/TRAINER

Apprentice  “Apprenticeship is Learning On-the-job”

- Practice safe work habits.
- Use your apprenticeship training standard as a journal to keep track of which skills you have achieved.
- Talk over your training plan with your Training Consultant, Employer, Union, or Sponsor.
- Know what tools are required for your trade and how to use them.
- Ask questions and keep asking.
- Talk to your employer about your training needs.
- Demonstrate enthusiasm and good work habits.
- Ensure that you and your supervisor/trainer sign off skill/skill sets upon demonstration of competency.

Sponsor/Employer  “Training is an Investment”

- Demonstrate safe work habits.
- Attest to successful achievement by signing the skill/skills sets.
- Provide opportunities and time for the apprentice to learn the trade.
- Offer practical trade training experiences that cover all of the skill sets.
- Foster work ethics that support training while minimizing productivity losses.
- Set out clear expectations, then recognize or reward performance excellence.
- Involve both the apprentice and supervisor/trainer in developing the training plan.
- Use the Training Standard as a monitoring tool and part of regular performance evaluations.
- Select supervisors/trainers with good communication skills and who work well with others.
- Encourage supervisors/trainers to take upgrading courses - (e.g. Train the Trainer, Mentor Coach, etc).
- Complete the Skill Set Completion Form once the apprentice has demonstrated competency in the training.
- Ensure that the apprentice always works under the direction of or has access to a qualified supervisor/trainer.
- Vary the apprentice’s exposure to all the skills set out in the training standard.
Supervisor/Trainer

- Demonstrate safe work habits.
- Treat apprentices fairly and with respect.
- Use the Training Standard as a guide to evaluating competence in each skill area. In using the Training Standard, supervisors/trainers will be able to ensure that the apprentice is developing skills detailed for the trade/occupation.
- Review the Training Standard with the apprentice and develop a training plan.
- Respond fully to all questions.
- Be patient. Explain what is to be done then, show how it is done, and then let the apprentice demonstrate the task.
- Provide continuous feedback.
- Sign off individual skills/skill sets once the apprentice demonstrates competence in the skill.

Suggestions for Assessing the Progress of the Apprentice in the Workplace

- Use informal daily observation.
- Provide constructive feedback to build confidence.
- Allow the supervisor/trainer time to teach and demonstrate the skills.
- Take prompt action wherever problems occur.
- Conduct regular performance reviews involving the apprentice, supervisor/trainer and sponsor/employer.
- Use the Training Standard as the reference for establishing the competency of the apprentice.
### SKILL SET COMPLETION FORM

<table>
<thead>
<tr>
<th>SKILLS SETS</th>
<th>TITLE</th>
<th>SIGNING AUTHORITY</th>
</tr>
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<tbody>
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<td>5230.0</td>
<td>PROTECT SELF AND OTHERS</td>
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<tr>
<td>5231.0</td>
<td>PLAN AND PREPARE FOR MACHINING JOB</td>
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<tr>
<td>5232.0</td>
<td>PERFORM WORK-IN-PROCESS DIMENSIONAL OR SURFACE VERIFICATION</td>
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<td>5233.0</td>
<td>PERFORM BENCHWORK</td>
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<td>5234.0</td>
<td>PERFORM SAWING</td>
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<tr>
<td>5235.0</td>
<td>PERFORM DRILLING USING DRILL PRESS/MACHINE</td>
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<td>5236.0</td>
<td>PERFORM MACHINE GRINDING</td>
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<td>5237.0</td>
<td>PERFORM LATHE WORK</td>
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<td>5238.0</td>
<td>PERFORM MILLING</td>
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<tr>
<td>5239.0</td>
<td>PERFORM NUMERICALLY CONTROLLED (NC)/COMPUTERIZED NUMERICALLY CONTROLLED (CNC) MACHINING</td>
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</table>

### NOTE ON SHADED PERFORMANCE OBJECTIVES AND SKILLS:

- Shaded performance objectives and skill sets are optional. The shaded skills do not have to be demonstrated or signed-off for completion of the on-the-job component of the apprenticeship.
- The in-school curriculum learning outcomes will cover all of the skill sets, both shaded and unshaded.
- The Certificate of Qualification examination will test the whole of the trade and may test both shaded and unshaded performance skill sets.
U5230.0  PROTECT SELF AND OTHERS

GENERAL PERFORMANCE OBJECTIVE

Protect Self and Others by: identifying health and safety hazards; wearing, adjusting, and maintaining protective clothing, equipment, and respiratory protectors; practising safe work habits, industrial hygiene, and good housekeeping; handling designated substances; following fire procedures and first aid procedures; operating safety equipment, lifting devices, and material handling equipment; reporting injuries; conducting pre-operational check of equipment; and, locking out equipment.

SKILLS

PERFORMANCE OBJECTIVES

U5230.01  Identify health and safety hazards in the workplace, so that the potential for personal injury, damage to equipment or the environment is prevented, and corrective action is taken as defined in Safety Legislation or company standards/procedures and hazards are reported.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5230.02  Wear, adjust, and maintain personal protective equipment including eye, ear, hand, and foot protectors to ensure correct fit and optimum protection for the wearer and the task being performed, in compliance with company standards/procedures and Safety Legislation.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5230.03  Wear, adjust, and maintain respiratory protectors to ensure correct fit and optimum protection in compliance with company standards/procedures and Safety Legislation.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date
U5230.04  **Practise safe work habits** by staying outside guards and barricades, wearing required clothing (not loose or torn), confining long hair, and removing jewellery in accordance with company standards/procedures and Safety Legislation.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5230.05  **Follow fire procedures** including (not limited to) locating and assessing the severity of the fire, taking appropriate action, suppressing minor fire, activating alarm, and reporting, in compliance with company standards/procedures and Safety Legislation.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5230.06  **Operate emergency safety equipment** including (not limited to) fire extinguishers, respirators, barrier creams, and fire blankets, ensuring that procedures are carried out in a safe and efficient manner in accordance with company standards/procedures and Safety Legislation.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5230.07  **Practise industrial hygiene** by wearing required clothing and using eye wash or showering to avoid contamination or injury, in compliance with company standards/procedures and Safety Legislation.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date
U5230.00 PROTECT SELF AND OTHERS ...cont'd

U5230.08 Practise good housekeeping in the workplace by cleaning up spills or leaks, keeping work area clean and clear of obstructions, and storing tools or equipment, so that the potential for accident or injury is prevented and tools or equipment are in place and available in compliance with company standards/procedures and Safety Legislation.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5230.09 Conduct pre-operational check of equipment by checking that guards and safety devices are in place, secured, and not damaged in compliance with company standards/procedures and Safety Legislation.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5230.10 Report injuries to supervisor or first aid personnel promptly and clearly, ensuring that the injured person is attended to and information is reported precisely and accurately describing how incident occurred, so that future recurrence of similar accidents is prevented in compliance with company standards/procedures and Safety Legislation.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5230.11 Follow procedures for applying first aid to treat conditions including (not limited to) sudden illness, burns, cuts, abrasions, sprains, chemical inhalations, falls, and contaminants in eyes, so that the condition of the victim is stabilized and prepared for further first aid treatment in compliance with company standards/procedures and Safety Legislation.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date
<table>
<thead>
<tr>
<th>U5230.00</th>
<th><strong>PROTECT SELF AND OTHERS ...cont'd</strong></th>
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</thead>
<tbody>
<tr>
<td><strong>U5230.12</strong></td>
<td><strong>Lock out mechanical equipment</strong> for repair or maintenance by shutting down and tagging machine or manufacturing process to ensure that no materials can enter the equipment being repaired or maintained, no damage is caused to the machine, and accidents are prevented in compliance with company standards/procedures and Safety Legislation.</td>
</tr>
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</table>

Apprentice’s Signature and Date  
Supervisor’s/Trainer’s Signature and Date

| **U5230.13** | **Handle designated substances** using specified handling and storage equipment, so that the operator is protected from injury, the environment from contamination, and safe procedures are followed in compliance with Safety Legislation and company standards/procedures. |

Apprentice’s Signature and Date  
Supervisor’s/Trainer’s Signature and Date

| **U5230.14** | **Operate lifting equipment** including (not limited to) hoists, overhead cranes, chain falls, lift pins, eye bolts, slings, cables, and chains, to remove, transport, and store materials, parts, or equipment in compliance with Safety Legislation and company standards/procedures. |

Apprentice’s Signature and Date  
Supervisor’s/Trainer’s Signature and Date

Sponsor’s/Employer’s Name  
Sponsor’s/Employer’s Signature
PLAN AND PREPARE FOR MACHINING JOB

GENERAL PERFORMANCE OBJECTIVE

Plan and prepare for machining job by: reading and interpreting engineering drawings; performing calculations; reading and interpreting work-process documentation; verifying workpiece material; identifying and selecting cutting fluids, machines, machine controls and systems, tooling, measuring or checking devices, work-holding devices, and lifting or rigging equipment; identifying and preparing cutting tools; selecting speeds and feeds; laying out features of the engineering drawing; picking up datum/starting position; and, communicating with co-workers.

PERFORMANCE OBJECTIVES

SKILLS

U5231.01 Read and interpret engineering drawings to identify dimensions and tolerances, machine surface designations and allowances, type and features of workpiece material, and any other information needed to plan the machining job in accordance with company standards/procedures and job documentation.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5231.02 Perform calculations for machining operations including determining speeds and feeds, calculating cutting tool positions, checking workpiece alignments, and calculating dimensions to be measured and verified, using both System International (S.I.) and Imperial System, so that all required specifications and parameters are correctly determined to machine the workpiece in accordance with engineering drawings and job specifications.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5231.03 Read and interpret work-process documentation to identify required machines, job operation, sequencing of job, method of machining and set-ups, and any other information needed to plan the machining job.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date
U5231.00 PLAN AND PREPARE FOR MACHINING JOB ...cont’d

U5231.04 **Verify workpiece material** for correct size and type by checking colour codes, lettering, or numerical stamps to ensure that the workpiece selected conforms to engineering drawings and job instruction sheets.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5231.05 **Identify and select cutting fluids** using manuals, charts, engineering drawings, and material safety data sheets, ensuring that the cutting fluid selected is the correct one to maximize machining without damage to workpiece, cutting tool, or machine.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5231.06 **Identify and select machines** including conventional and numerically controlled saws, drills, lathes, grinders, and vertical or horizontal mills, using information from engineering drawings and work process documentation, to ensure that the machine selected is the correct one for the application and available to perform the job.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5231.07 **Identify and check machine controls and systems** including locating and identifying switches, buttons, levers, controls, and safety devices, to ensure that all controls are operational and functioning in accordance with manufacturer’s specifications and company standards/procedures.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date
GENERAL MACHINIST

U5231.00 PLAN AND PREPARE FOR MACHINING JOB ...cont’d

U5231.08 **Identify and select tooling** required to cut the workpiece by using information in engineering drawings and job instructions, to ensure that tooling selected is the correct size and type for the application and available to perform the job.

Apprentice’s Signature and Date    Supervisor’s/Trainer’s Signature and Date

U5231.09 **Identify and prepare cutting tools** by sharpening or replacing tools so that the cutting shape and angle are prepared for optimum cutting and personal safety in accordance with manufacturer’s specifications, engineering drawings, and company standards/procedures.

Apprentice’s Signature and Date    Supervisor’s/Trainer’s Signature and Date

U5231.10 **Identify and select measuring instruments and checking devices**, ensuring that instruments and devices selected are capable of measuring to obtain the dimensions and tolerances specified in the engineering drawings, job specifications, and process layout.

Apprentice’s Signature and Date    Supervisor’s/Trainer’s Signature and Date

U5231.11 **Select machine speeds and feeds** using speed and feed charts and in accordance with size, type, and hardness of workpiece materials, so that the machines perform optimum cutting without damage to workpiece, cutting tools, or machines and ensures personal safety.

Apprentice’s Signature and Date    Supervisor’s/Trainer’s Signature and Date
U5231.00 PLAN AND PREPARE FOR MACHINING JOB ...cont’d

U5231.12 Lay out features of engineering drawings on to the workpiece using precision measuring instruments and layout equipment including (not limited to) scribe, center punch, vernier height gauge, surface plate, combination set, and layout medium or dyes, so that the completed layout conforms to engineering drawings and job specifications.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5231.13 Identify and select work-holding devices including (not limited to) vises, clamps, jigs, chucks, face plates, centers, catch plates, steady rest, tailstocks, and mandrels, ensuring that the work-holding device selected is the correct one to safely and securely position and locate the workpiece in the machine in accordance with Safety Legislation, job specifications, and company standards/procedures.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5231.14 Pick up datum/starting position using layout lines, tooling balls, or edge of the part and required tools including (not limited to) pointer, wiggler, indicator, and edge finder to identify and locate the datum/starting position as specified in engineering drawings and job specifications.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5231.15 Identify and select lifting and rigging equipment including (not limited to) hoists, overhead cranes, chain falls, lift pins, cables, eye bolts, and chains, ensuring that equipment is selected in compliance with Safety Legislation and company standards/procedures for the safe handling and moving of materials.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date
U5231.00  PLAN AND PREPARE FOR MACHINING JOB  ...cont’ed

U5231.16  **Communicate with co-workers** to identify previous job operations, availability of tools, parts, and machinery, scheduling requirements, and any other information needed to plan and prepare for the machining job, ensuring that the information communicated is clear, concise, and accurate.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

Sponsor’s/Employer’s Name  Sponsor’s/Employer’s Signature
GENERAL PERFORMANCE OBJECTIVE

Perform work-in-process dimensional or surface verification by: checking straight cuts, shapes, threads, holes, tapers, and hardness; maintaining material identification; deburring workpiece; checking surfaces; performing final inspection; completing work documentation.

PERFORMANCE OBJECTIVES

SKILLS

U5232.01 Check straight cuts by using precision measuring instruments including (not limited to) micrometer, verniers, callipers, squares, straight edge, dial indicator, and surface comparator, to ensure that the accurate size, finish, parallelism, and squareness of straight cuts conform with engineering drawings and job specifications.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5232.02 Check shapes by using precision measuring instruments and checking devices including (not limited to) radius gauges, surface comparator, and verniers, to ensure that the profile and finish of the cut shape conform to engineering drawing and job specifications.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5232.03 Check threads by using precision measuring instruments, checking devices, and various checking methods including (not limited to) 3-wire method, thread micrometer, thread gauge, and plug or ring gauges, to ensure that the accuracy of pitch, thread geometry, and size of cut threads conform to the engineering drawings and job specifications.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date
U5232.04  **Check holes** by using precision measuring instruments and checking devices including (not limited to) dial indicators, bore gauges, plug gauges, telescopic gauges, surface comparators, and verniers, to ensure that the accuracy of the diameter, depth, concentricity, position, and finish of cut holes conform with engineering drawings and job specifications.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5232.05  **Check tapers** using precision measuring instruments and checking devices including (not limited to) taper gauge, sine bar, micrometer, and vernier to ensure that the accuracy of the angle, taper/foot, and diameter of the cut tapers conform with engineering drawings and job specifications.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5232.06  **Check hardness** using various types of hardness testers and comparison charts to ensure that the hardness level of the workpiece materials conforms with engineering drawings and job specifications.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date
**U5232.00**  **PERFORM WORK-IN-PROCESS DIMENSIONAL OR SURFACE VERIFICATION** ...cont’d

**U5232.07**  **Maintain material identification** by marking or stamping workpiece and completing shop documentation, to facilitate traceability of the final product or work-in-process and to maintain inventory control in accordance with company standards/procedures.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

**U5232.08**  **Deburr workpiece** using files, scrapers, emery cloth, sanders, and hand or pedestal grinders to remove excess material and to ensure safe handling in accordance with Safety Legislation, engineering drawings, and job specifications.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

**U5232.09**  **Check surfaces** using surface comparators to ensure that surface is finished in micro-inches or microns as specified in the engineering drawings and job specifications.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

**U5232.10**  **Perform final inspection** using precision measuring instruments and checking devices including (not limited to) inside and outside micrometers, vernier height gauges or indicators, gauge blocks, and pin gauges to ensure that the tolerances and dimensions of the workpiece conform to the engineering drawings and job specifications.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date
U5232.00  PERFORM WORK-IN-PROCESS DIMENSIONAL OR SURFACE VERIFICATION ...cont’d

U5232.11  Complete work documentation including (not limited to) tracking sheets, sign-off sheets, inspection reports, or procedure sheets, to record the finalization of jobs and to facilitate traceability of work-in-process, ensuring that all data is recorded accurately and clearly in accordance with engineering drawings, job specifications, and company standards/procedures.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

Sponsor’s/Employer’s Name  Sponsor’s/Employer’s Signature
PERFORM BENCHWORK

GENERAL PERFORMANCE OBJECTIVE

Perform benchwork by: hand-filing; hand-sawing; hand-drilling holes; hand-tapping threaded holes; hand-reaming; chasing threads; hand-grinding; and, practising good housekeeping.

PERFORMANCE OBJECTIVES

SKILLS

U5233.01 **Hand-file** using files including (not limited to) flat, needle, bastard, rat-tail, lathe, and half-round files to remove excessive material so that workpiece is filed in accordance with engineering drawings and job specifications.

Apprentice’s Signature and Date  
Supervisor’s/Trainer’s Signature and Date

U5233.02 **Hand-saw** using cut-off saws to cut workpiece to specified lengths in accordance with engineering drawings and job specifications.

Apprentice’s Signature and Date  
Supervisor’s/Trainer’s Signature and Date

U5233.03 **Hand-drill holes** using power drill and drill bits so that the size of the drilled holes conform with engineering drawings and job specifications.

Apprentice’s Signature and Date  
Supervisor’s/Trainer’s Signature and Date

U5233.04 **Hand-tap threaded holes** using taps, T-handle, and tapping block, so that the depth and squareness of tapped threads conform to engineering drawings and job specifications.

Apprentice’s Signature and Date  
Supervisor’s/Trainer’s Signature and Date
U5233.00  **PERFORM BENCHWORK** ...cont’d

U5233.05  **Hand-ream** using straight or spiral-fluted reamers to remove excessive material, so that the diameter and depth of reamed hole conform to engineering drawings and job specifications.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5233.06  **Chase threads** using hand taps and dies to repair or clean damaged threads, so that the threads conform with engineering drawings and job specifications.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5233.07  **Hand-grind** using pneumatic or electric hand grinders to remove excess material, so that the workpiece is ground in accordance with engineering drawings and job specifications.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5233.08  **Practise good housekeeping** in the workplace by cleaning up spills or leaks, keeping work area clean and clear of obstructions, and storing tools or equipment, so that the potential for accident or injury is prevented and tools or equipment are in place and available in compliance with company standards/procedures and **Safety Legislation**.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

Sponsor’s/Employer’s Name  Sponsor’s/Employer’s Signature
U5234.0  PERFORM SAWING

GENERAL PERFORMANCE OBJECTIVE

Perform sawing by: checking fused/welded blade; laying out features of the engineering drawings; locating and positioning workpiece in saw; selecting speeds and feeds; installing and test-running blade; checking first cut-off; cutting shapes with vertical bandsaw; cutting squared and angled surfaces with a power cut-off saw; maintaining material identification; deburring workpiece; performing final inspection; completing work documentation; moving workpiece; and, practising good housekeeping.

PERFORMANCE OBJECTIVES

SKILLS

U5234.01  Check fused/welded blade to ensure that joined saw has a continuous cutting edge in accordance with manufacturer’s or job specifications, company standards/procedures, and Safety Legislation.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5234.02  Lay out features of engineering drawings on to the workpiece using precision measuring instruments and layout equipment including (not limited to) scribe, centre punch, vernier height gauge, surface plate, combination set, and layout medium or dyes, so that the completed layout conforms to engineering drawings and job specifications.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5234.03  Locate and position workpiece in saw to required operational clearances by setting up workholding devices including (not limited to) clamps, nesting fixtures, vises, or roller supports, so that the workpiece is aligned, secured, and stable during sawing operations in accordance with job specifications and Safety Legislation.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date
U5234.00  PERFORM SAWING …cont’d

U5234.04  Select speeds and feeds of saws using speed and feed charts and in accordance with the size, type, and hardness of workpiece material, so that the saw performs optimum cutting without damage to workpiece, cutting tools, or machines, and ensures personal safety.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5234.05  Install and test-run blade to check alignments and movements, so that the blade is installed to make the required cut, prevents machine or blade damage, and ensures personal safety in accordance with company standards/procedures and Safety Legislation.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5234.06  Check first cut-off by measuring and checking a cut-off piece, to ensure that the angles, squareness, and length of the sawed piece conform to the engineering drawings and job specifications.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5234.07  Cut shapes using a vertical bandsaw using required sawing sequences, speeds, feeds, and cutting fluids, so that the profile, size, and dimensions of the cut shapes conform to the engineering drawings, job specifications, and Safety Legislation.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date
U5234.00  PERFORM SAWING ...cont’d

U5234.08  Cut squared and angled surfaces using a power cut-off saw using required sawing sequences, speeds, feeds, and cutting fluids, so that the squareness, angles, and size of cut surfaces conform to engineering drawings, job specifications, and Safety Legislation.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5234.09  Maintain material identification by marking or stamping workpiece and completing shop documentation, to facilitate traceability of the final product or work-in-process and to maintain inventory control in accordance with company standards/procedures and job specifications.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5234.10  Deburr workpiece using files, scrapers, emery cloth, sanders, and hand or pedestal grinders, to remove excess material and to ensure safe handling in accordance with engineering drawings, job specifications, and Safety Legislation.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5234.11  Perform final inspection using precision measuring instruments and checking devices including (not limited to) inside and outside micrometers, vernier height gauges or indicators, gauge blocks, and pin gauges, to ensure that the tolerances and dimensions of the sawed workpiece conform to the engineering drawings and job specifications.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date
U5234.00 PERFORM SAWING ...cont’d

U5234.12 **Complete work documentation** including (not limited to) tracking sheets, sign-off sheets, inspection reports, or procedure sheets, to record the finalization of jobs and to facilitate traceability of work-in-process, ensuring that data is recorded accurately and clearly in accordance with engineering drawings, job specifications, and company standards/procedures.

Apprentice’s Signature and Date          Supervisor’s/Trainer’s Signature and Date

U5234.13 **Move workpiece** by operating lifting and rigging equipment including hoists, overhead cranes, chain falls, lift pins, eye bolts, slings, cables, and chains, to remove, transport, and store materials, parts, and equipment in compliance with Safety Legislation and company standards/procedures.

Apprentice’s Signature and Date          Supervisor’s/Trainer’s Signature and Date

U5234.14 **Practise good housekeeping** in the workplace by cleaning up spills or leaks, keeping work area clean and clear of obstructions, and storing tools or equipment so that the potential for accident or injury is prevented and tools or equipment are in place and available in compliance with company standards/procedures and Safety Legislation.

Apprentice’s Signature and Date          Supervisor’s/Trainer’s Signature and Date

Sponsor’s/Employer’s Name          Sponsor’s/Employer’s Signature
U5235.0 PERFORM DRILLING USING DRILL PRESS/MACHINES

GENERAL PERFORMANCE OBJECTIVE

Perform drilling using drill press/machine by: selecting drill tooling; identifying and preparing cutting tools; locating and positioning workpiece in drill; setting up tooling; selecting speeds and feeds; center-drilling a layout punch mark; drilling, chamfering, reaming, machine-threading, spot-facing, counter-boring, and counter-sinking a hole; maintaining material identification; deburring workpiece; performing final inspection; completing work documentation; moving workpiece; and, practising good housekeeping.

SKILLS

PERFORMANCE OBJECTIVES

U5235.01 Select drill tooling including drill bits, centre-drill, reamers, taps, counter-bores, counter-sinks, and spot-faces by using information in engineering drawings and job specifications to ensure that tooling is the correct size, shape, type, and grade for the application.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5235.02 Identify and prepare cutting tools for drills by sharpening or replacing tools, so that the cutting shape and angle is prepared for optimum cutting and personal safety in accordance with job or manufacturer's specifications and company standards/procedures.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5235.03 Locate and position workpiece in drill to required operational clearances by setting up and securing workpiece with workholding devices including (not limited to) drilling vises, clamps, jigs, angle plates, and chucks, so that the workpiece is aligned, secured, and stable during drilling in accordance with job specifications and Safety Legislation.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date
U5235.00 PERFORM DRILLING USING DRILL PRESS/MACHINE ...cont’d

U5235.04 Set up tooling in drills to required operational alignments using holding devices including (not limited to) drill chucks, taper sleeves, and tapping heads, to ensure that tooling is in position and held securely during drilling in accordance with job specifications and Safety Legislation.

Apprentice’s Signature and Date  
Supervisor’s/Trainer’s Signature and Date

U5235.05 Select speeds and feeds of drill using speed and feed charts and in accordance with the size, type, and hardness of workpiece material, so that the drill performs optimum cutting without damage to workpiece, cutting tools, or machines, and ensures personal safety.

Apprentice’s Signature and Date  
Supervisor’s/Trainer’s Signature and Date

U5235.06 Centre-drill a layout punch mark using a drill press/machine, chuck, centre-drill, and cutting fluid, so that the punch mark is drilled in accordance with engineering drawings and job specifications.

Apprentice’s Signature and Date  
Supervisor’s/Trainer’s Signature and Date

U5235.07 Drill a hole using a drilling machine, drill bits, and cutting fluids, so that the size and depth of drilled hole conform to engineering drawings and job specifications.

Apprentice’s Signature and Date  
Supervisor’s/Trainer’s Signature and Date

U5235.08 Chamfer a hole using a drilling machine, countersinks, and cutting fluids to break sharp edges, so that the chamfered hole conforms to engineering drawings and job specifications.

Apprentice’s Signature and Date  
Supervisor’s/Trainer’s Signature and Date
U5235.00 PERFORM DRILLING USING DRILL PRESS/MACHINE ... cont’d

U5235.09 **Ream a hole** using a drilling machine, reamers, and cutting fluids, so that the diameter of the reamed hole conforms to engineering drawing or job specifications.

Apprentice’s Signature and Date

Supervisor’s/Trainer’s Signature and Date

U5235.10 **Machine-thread a hole** using a drilling machine, tapping heads, taps, and cutting fluids, so that the depth, size, and pitch of the threaded depth of the hole conform with engineering drawings and job specifications.

Apprentice’s Signature and Date

Supervisor’s/Trainer’s Signature and Date

U5235.11 **Spot-face a hole** using a drilling machine, spot-facing tools, and cutting fluids so that the depth and diameter of the spot-faced hole conform to engineering drawings or job specifications.

Apprentice’s Signature and Date

Supervisor’s/Trainer’s Signature and Date

U5235.12 **Counter-bore a hole** using a drilling machine, counter-boring tools, and cutting fluids, so that the depth and diameter of the counter-bored hole conform to engineering drawings and job specifications.

Apprentice’s Signature and Date

Supervisor’s/Trainer’s Signature and Date

U5235.13 **Counter-sink a hole** using a drilling machine, countersinks, and cutting fluids, so that the depth and diameter of the counter-sunk hole conform to engineering drawings and job specifications.

Apprentice’s Signature and Date

Supervisor’s/Trainer’s Signature and Date
### U5235.00 PERFORM DRILLING USING DRILL PRESS/MACHINE ...cont’d

<table>
<thead>
<tr>
<th>U5235.14</th>
<th><strong>Maintain material identification</strong> by marking or stamping workpiece and completing shop documentation, to facilitate traceability of the final product or work-in-process and to maintain inventory control in accordance with company standards/procedures and job specifications.</th>
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<tbody>
<tr>
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<td>Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date</td>
</tr>
<tr>
<td>U5235.15</td>
<td><strong>Deburr workpiece</strong> using files, scrapers, emery cloth, sanders, and hand or pedestal grinders, to remove excess material and to ensure safe handling in accordance with engineering drawings, job specifications, and Safety Legislation.</td>
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<td>Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date</td>
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<tr>
<td>U5235.16</td>
<td><strong>Perform final inspection</strong> using precision measuring instruments and checking devices including (not limited to) inside and outside micrometers, vernier height gauges or indicators, gauge blocks, and pin gauges, to ensure that the tolerances and dimensions of the drilled workpiece conform to the engineering drawings and job specifications.</td>
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<td>Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date</td>
</tr>
<tr>
<td>U5235.17</td>
<td><strong>Move workpiece</strong> by operating lifting and rigging equipment including (not limited to) hoists, overhead cranes, chain falls, lift pins, eye bolts, slings, cables, and chains, to remove, transport, and store materials, parts, or equipment in compliance with Safety Legislation and company standards/procedures.</td>
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<td>Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date</td>
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</table>
U5235.00  **PERFORM DRILLING USING DRILL PRESS/MACHINE** ...cont’d

U5235.18  **Practise good housekeeping** in the workplace by cleaning up spills or leaks, keeping work area clean and clear of obstructions, and storing tools or equipment, so that the potential for accident or injury is prevented and tools or equipment are in place and available in compliance with company standards/procedures and Safety Legislation.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5235.19  **Complete work documentation** including (not limited to) tracking sheets, sign-off sheets, inspection reports, or procedure sheets to record the finalization of jobs and to facilitate traceability of work-in-process, ensuring that all data is recorded accurately and clearly in accordance with engineering drawings, job specifications, and company standards/procedures.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

Sponsor’s/Employer’s Name  Sponsor’s/Employer’s Signature
U5236.0 PERFORM MACHINE GRINDING

GENERAL PERFORMANCE OBJECTIVE

Perform machine grinding by: selecting grinding wheels; checking condition of grinding wheel; installing grinding wheel; locating and positioning workpiece; surface grinding workpiece; honing holes; lapping workpiece; grinding inside and outside diameters; grinding tools and cutters; checking ground surfaces; performing final inspection; completing work documentation; moving workpiece; and, practising good housekeeping.

SKILLS

PERFORMANCE OBJECTIVES

U5236.01 Select grinding wheel using information in engineering drawings, charts, and job specifications, to ensure that the wheel selected is the correct grade and size needed to finish, shape, and size workface in accordance with the hardness and finish of the workpiece and job specifications.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5236.02 Check condition of grinding wheel for defects, cracks, or chips, and by taking corrective action or replacing if required, to ensure personal safety and to perform optimum cutting in accordance with job specifications and Safety Legislation.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5236.03 Install grinding wheel to specified radii and tangents/angles using diamond or star-wheel dresser, to ensure personal safety and to perform optimum grinding in accordance with job specifications, Safety Legislation, and company standards/procedures.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date
U5236.00  PERFORM MACHINE GRINDING ...cont’d

U5236.04  **Locate and position workpiece in grinder** to required operational clearances by setting up workholding devices including (not limited to) angle plate, magnetic holders, vises, chucks, centres, jigs, V-block, or mandrels, so that the workpiece is aligned, secured, and stable during grinding operations in accordance with job specifications and Safety Legislation.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5236.05  **Surface grind workpiece** using surface grinders so that the finish, flatness, and size of ground surfaces conform to engineering drawings and job specifications.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5236.06  **Hone holes** using a honing machine and required attachments, so that the dimension and tolerance of honed hole conform to engineering drawings and job specifications.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5236.07  **Lap workpiece** by hand grinding or using a power lapping machine so that the finish and flatness of the lapped surface conform to engineering drawings and job specifications.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5236.08  **Grind inside and outside diameters (ID/OD)** using machine grinders, so that the dimensions and tolerances of ground ID/OD surfaces conform to engineering drawings and job specifications.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date
U5236.00  **PERFORM MACHINE GRINDING** ...cont’d

U5236.09  **Grind tools and cutters** using pedestal, surface, or tool and cutter grinders, so that the ground cutting edge of tools or cutters conforms to tool geometry standards to ensure optimum metal removal and finish.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5236.10  **Check ground surfaces** using surface comparators, to ensure that the surface is finished in microinches or microns as specified in the engineering drawings and job specifications.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5236.11  **Perform final inspection** using precision measuring instruments and checking devices including (not limited to) inside and outside micrometers, vernier height gauges or indicators, gauge blocks, and pin gauges, to ensure that the tolerances and dimensions of the ground workpiece conform to the engineering drawings and job specifications.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5236.12  **Move workpiece** by operating lifting and rigging equipment including (not limited to) hoists, overhead cranes, chain falls, lift pins, eye bolts, slings, cables, or chains, to remove, transport, and store materials, parts, or equipment in compliance with Safety Legislation and company standards/procedures.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date
U5236.00  PERFORM MACHINE GRINDING ...cont’d

U5236.13  Complete work documentation including (not limited to) tracking sheets, sign-off sheets, inspection reports, or procedure sheets, to record the finalization of jobs and to facilitate traceability of work-in-process, ensuring that all data is recorded accurately and clearly in accordance with engineering drawings, job specifications, and company standards/procedures.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5236.14  Practise good housekeeping in the workplace by cleaning up spills or leaks, keeping work area clean and clear of obstructions, and storing tools or equipment, so that the potential for accident or injury is prevented and tools or equipment are in place and available in compliance with company standards/procedures and Safety Legislation.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

Sponsor’s/Employer’s Name  Sponsor’s/Employer’s Signature
GENERAL PERFORMANCE OBJECTIVE

Perform lathe work by: selecting, identifying, and preparing cutting tools; locating and positioning workpiece; setting up lathe cutting tools; selecting speeds and feeds; taking a sizing (preliminary) cut; establishing a reference or starting point (datum); facing a surface; turning an external diameter; drilling, boring, reaming, and tapping a hole; turning an internal or external thread; producing a taper; knurling cylindrical surface patterns; grooving and parting-off; maintaining material identification; deburring workpiece; performing final inspection; moving workpiece; completing work documentation; and, practising good housekeeping.

PERFORMANCE OBJECTIVES

SKILLS

U5237.01 Select lathe cutting tools including (not limited to) drill bits, boring, parting, threading, facing, or turning tools, by using information from engineering drawings and job instructions to ensure that the tools selected are the correct ones needed to cut the workpiece material.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5237.02 Identify and prepare lathe cutting tools by sharpening or replacing, so that the cutting shape and angle is prepared for optimum cutting and personal safety, in accordance with manufacturer’s specifications and company standards/procedures.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5237.03 Locate and position workpiece in lathe to required operational clearances by setting up and securing workholding devices including (not limited to) chucks, face plates, centres, catch plates, steady rest, or tail stock, so that the workpiece is aligned, secured, and stable during machining in accordance with job specifications, Safety Legislation, and engineering drawings.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date
<table>
<thead>
<tr>
<th>U5237.00</th>
<th><strong>PERFORM LATHE WORK</strong> ...cont’d</th>
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<tbody>
<tr>
<td><strong>U5237.04</strong></td>
<td>Set up lathe cutting tools to required operational alignments using tool posts and tail stocks, to ensure that tools are in position and held securely during machining in accordance with job specifications and engineering drawings.</td>
</tr>
<tr>
<td></td>
<td>Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date</td>
</tr>
<tr>
<td><strong>U5237.05</strong></td>
<td>Select speeds and feeds of lathe using speed and feed charts and in accordance with the size, type, and hardness of workpiece material, so that the lathe performs optimum cutting without damage to workpiece, cutting tools, or machine and ensures personal safety in accordance with job specifications.</td>
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<td></td>
<td>Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date</td>
</tr>
<tr>
<td><strong>U5237.06</strong></td>
<td>Take a sizing (preliminary) cut to determine reference workface and to check speeds and feeds to ensure that lathe is set up in accordance with engineering drawings and job specifications.</td>
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<td>Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date</td>
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<tr>
<td><strong>U5237.07</strong></td>
<td>Establish a reference or starting point (datum) by zeroing out machine and ensuring that the datum is correctly located in accordance with job specifications, engineering drawings, and company standards/procedures</td>
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<td></td>
<td>Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date</td>
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</table>
U5237.00  **PERFORM LATHE WORK** ...cont’d

U5237.08  **Face a surface** using a lathe and single-point tool bit and by measuring or checking with vernier, straight edge, or micrometer, so that the surface flatness and finished edge conform to engineering drawings and job specifications.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5237.09  **Turn an external diameter** using a lathe and single-point tool and by measuring or checking with a vernier or micrometer, so that the turned diameter conforms to engineering drawings and job specifications.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5237.10  **Drill a hole** using a lathe, centre-drill, drills, and tailstock, so that the diameter and depth of the drilled hole conform to engineering drawings and job specifications.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5237.11  **Bore an internal diameter** using a lathe and boring bars mounted in a toolpost, so that the close-toleranced internal diameters conform to engineering drawings and job specifications.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5237.12  **Ream a hole** using a lathe, centre-drill, drills, reamers, and tail-stock, and by measuring or checking with vernier, micrometer, and gauges, so that the depth and diameter of the reamed hole conform to engineering drawings and job specifications.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date
PERFORM LATHE WORK

U5237.00

...cont’d

U5237.13  **Tap a hole** using on lathe, taps, tapping head, and tailstock, so that the depth, diameter, and thread pitch of the tapped hole conform to engineering drawings and job specifications.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5237.14  **Turn an internal or external thread** using a lathe and single-point tool bit and by measuring or checking with thread micrometers and thread plug gauge (go-no-go), so that the pitch, geometrical form, and dimensional tolerance of the turned thread conform to engineering drawings and thread standards.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5237.15  **Produce a taper** using a lathe, offset tailstock, taper-turning attachment, and compound rest, and by measuring or checking with protractors, micrometers, vernier height gauges, or templates, so that the size and angle of turned taper conform to engineering drawings and job specifications.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5237.16  **Knurl cylindrical surface patterns** using a lathe and knurling tools, so that the diameter, form, depth, and finish of knurled surface patterns conform to engineering drawings and job specifications.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5237.17  **Groove and part-off** using a lathe and grooving or parting tools, so that the width, length, depth, and square of cut-offs conform to engineering drawings and job specifications.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date
U5237.00 REW LATHE WORK ...cont’d

U5237.18 Maintain material identification by marking or stamping workpiece and completing shop documentation, to facilitate traceability of the final product or work-in-process and to maintain inventory control in accordance with company standards/procedures.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5237.19 Deburr workpiece using files, scrapers, emery cloth, sanders, and hand or pedestal grinders to remove excess material and to ensure safe handling in accordance with engineering drawings, job specifications, and Safety Legislation.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5237.20 Perform final Inspection using precision measuring instruments and checking devices including (not limited to) inside and outside micrometers, vernier height gauges or indicators, gauge blocks, and pin gauges, to ensure that the tolerances and dimensions of the turned workpiece conform to the engineering drawings and job specifications.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5237.21 Complete work documentation including (not limited to) tracking sheets, sign-off sheets, inspection reports, or procedure sheets to record the finalization of jobs and to facilitate traceability of work-in-process, ensuring that all data is recorded accurately and clearly in accordance with engineering drawings, job specifications, and company standards/procedures.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date
GENERAL MACHINIST

U5237.00 PERFORM LATHE WORK ...cont’d

U5237.22 Move workpiece by operating lifting and rigging equipment including (not limited to) hoists, overhead cranes, chain falls, lift pins, eye bolts, slings, cables, and chains, to remove, transport, and store materials, parts, and equipment in compliance with Safety Legislation and company standards/procedures.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5237.23 Practise good housekeeping in the workplace by cleaning up spills or leaks, keeping work area clean and clear of obstructions, and storing tools or equipment, so that the potential for accident or injury is prevented and tools or equipment are in place and available in compliance with company standards/procedures and Safety Legislation.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

Sponsor’s/Employer’s Name  Sponsor’s/Employer’s Signature
GENERAL MACHINIST

U5238.0 PERFORM MILLING

GENERAL PERFORMANCE OBJECTIVE

Perform milling by: selecting milling cutter tools; identifying and preparing cutting tools; setting up and maintaining adjustable support tools; setting up milling cutting tools; selecting speeds and feeds; fly-cutting; face-milling; machining steps, cut-outs, angles, and open slots; machining a pocket or slot; machining and boring holes; maintaining material identification; deburring workpiece; performing final inspection; moving workpiece; completing work documentation, and, practising good housekeeping.

SKILLS

PERFORMANCE OBJECTIVES

U5238.01 Select milling cutting tools including (not limited to) end mills, face mills, shell cutters, slot drills, boring bars, slitting saws, and boring head, by using information from engineering drawings and job instructions to ensure that the tools selected are the correct ones needed to mill the workpiece to specifications.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5238.02 Identify and prepare milling cutting tools by sharpening or replacing tools so that the cutting shape and angle is prepared for optimum cutting and personal safety in accordance with manufacturer’s specifications and company standards/procedures.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5238.03 Set-up and maintain milling adjustable support tools including (not limited to) indexing heads, vises, angle plates, sine bars, and tables, ensuring that the support tool is the correct one for the application and the workpiece is located and secured during machining in accordance with job specifications and Safety Legislation.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date
U5238.00  PERFORM MILLING ...cont’d

U5238.04  **Set-up milling cutting tools** to required operational alignments using arbours, collets, and drill chucks, to ensure the tools are in position and held securely during machining in accordance with job specifications and manufacturer’s specifications.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5238.05  **Select speeds and feeds of mill** using speed and feed charts and in accordance with the size, type, and hardness of workpiece material, so that the mill performs optimum cutting without damage to workpiece, cutting tools, or machine and ensures personal safety.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5238.06  **Perform fly-cutting** using a milling machine, single-point tool bit, and required cutting fluid, so that the size, shape, squareness, and flatness of the fly-cut workpiece conform to engineering drawings and job specifications.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5238.07  **Face-mill** using a milling machine, multi-point tool bit, face mill, and required cutting fluids, so that the size, shape, squareness, and flatness of the faced workpiece conform to engineering drawings and job specifications.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5238.08  **Machine steps, cut-outs, angles, and open slots** using a milling machine, end mill, and required cutting fluid, so that the size, shape, and angle of the end-milled workpiece conform to engineering drawings and job specifications.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date
U5238.00 PERFORM MILLING ...cont’d

U5238.09 **Machine a pocket or slot** using a milling machine, slot drill, center cutting end mill, and required cutting fluid, so that the size, shape, and angle of milled pockets or slots conform to engineering drawings and job specifications.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5238.10 **Machine a hole** using a milling machine, drill bits, reamers, slot drills, and required cutting fluid, so that the diameter, depth, and tolerance of the milled hole conform to engineering drawings and job specifications.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5238.11 **Bore holes** using a milling machine, boring bar, boring head, and required cutting fluid, so that the diameter, finish, depth and location of the bored hole conform to engineering drawings and job specifications.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5238.12 **Maintain material identification** by marking or stamping workpiece and completing shop documentation, to facilitate traceability of the final product or work-in-process and to maintain inventory control in accordance with company standards/procedures.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

U5238.13 **Deburr workpiece** using files, scrapers, emery cloth, sanders, and hand or pedestal grinders to remove excess material and to ensure safe handling in accordance with engineering drawings, job specifications, and **Safety Legislation**.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date
**GENERAL MACHINIST**

**U5238.00**  **PERFORM MILLING** ...cont’d

**U5238.14**  **Perform final inspection** using precision measuring instruments and checking device instruments including (not limited to) inside and outside micrometers, vernier height gauges or indicators, gauge blocks, and pin gauges, to ensure that the tolerances and dimensions of the milled workpiece conform to the engineering drawings and job specifications.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

**U5238.15**  **Move workpiece** by operating lifting and rigging equipment including (not limited to) hoists, overhead cranes, chain falls, lift pins, eye bolts, slings, cables, and chains to remove, transport, and store materials, parts, and equipment in compliance with Safety Legislation and company standards/procedures.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

**U5238.16**  **Complete work documentation** including (not limited to) tracking sheets, sign-off sheets, inspection reports or procedure sheets to record the finalization of jobs and to facilitate traceability of work-in-process, ensuring that all data is recorded accurately and clearly in accordance with engineering drawings, job specifications, and company standards/procedures.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

**U5238.17**  **Practise good housekeeping** in the workplace by cleaning up spills or leaks, keeping work area clean and clear of obstructions, and storing tools or equipment, so that the potential for accident or injury is prevented and tools or equipment are in place and available in compliance with company standards/procedures and Safety Legislation.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date

Sponsor’s/Employer’s Name  Sponsor’s/Employer’s Signature
U5239.0 PERFORM NUMERICALLY CONTROLLED (NC)/COMPUTERIZED NUMERICALLY CONTROLLED (CNC) MACHINING

GENERAL PERFORMANCE OBJECTIVE

Perform NC/CNC machining by: identify and selecting NC/CNC machining process; preparing NC/CNC set-up sheet; inputting and processing program data; determining tool path and calculating coordinates; generating or modifying a program; verifying computer program; storing and recording verified NC/CNC program; reading and interpreting part program; selecting NC/CNC cutting tools and tooling; positioning and aligning workpiece in NC/CNC machine; setting up cutting tools; verifying tool sequence, tool path, and collision avoidance; monitoring NC/CNC machining process; adjusting tooling/offsets; performing final inspection; complete work documentation; and, practising good housekeeping.

PERFORMANCE OBJECTIVES

SKILLS

| U5239.01 | Identify and select numerically controlled machining process including Numerically Controlled (NC) and Computerized Numerically Controlled (CNC) machines, using information from the engineering drawings and job specifications to ensure that machining process selected is the correct one to make the parts or components.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date |

| U5239.02 | Prepare NC/CNC set-up sheet to identify and describe all pertinent information needed for set up of machine tools in accordance with engineering drawings and job specifications.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date |

| U5239.03 | Input and process program data to the machine memory using information from machine-tool manual and programming data, so that the data is input correctly to machine the part in accordance with engineering drawings and job process sheet.

Apprentice’s Signature and Date  Supervisor’s/Trainer’s Signature and Date |
U5239.00 **PERFORM NUMERICALLY CONTROLLED (NC)/COMPUTERIZED**
**NUMERICALLY CONTROLLED (CNC) MACHINING** ...cont’d

U5239.04 **Determine tool path and calculate coordinates** to establish cutter start-point, cutter finish-point, and geometry of path in accordance with set-up sheet, engineering drawings, and job specifications.

Apprentice’s Signature and Date  
Supervisor’s/Trainer’s Signature and Date

U5239.05 **Identify, select, and set up NC/CNC cutting tools and tooling** including (not limited to) tool holders, end and face mills, carbide insert tools, centre-drill, drill, taps, reamers, counter bores, and boring head to pre-determined reference points and by using information from the engineering drawings, prepared sequence sheets, and tool lists, to ensure that the tools and tooling selected are the correct ones to machine the workpiece efficiently and safely.

Apprentice’s Signature and Date  
Supervisor’s/Trainer’s Signature and Date

U5239.06 **Set up NC/CNC cutting tools** relative to pre-determined reference points and the tool sequencing as defined in the program, ensuring that tools are correctly set up to machine the workpiece in accordance with the CAD data, job sheets, engineering drawings, and job specifications.

Apprentice’s Signature and Date  
Supervisor’s/Trainer’s Signature and Date

U5239.07 **Identify, select, and set machine parameters** including (not limited to) spindle feeds, table feeds, and power settings using speed and feed charts and according to the type, size, grade, and hardness of the material to be cut, so that the workpiece is machined efficiently and safely without damage to tooling, machine, or workpiece and ensures personal safety in accordance with CAD data, engineering drawings and job specifications.

Apprentice’s Signature and Date  
Supervisor’s/Trainer’s Signature and Date
<table>
<thead>
<tr>
<th>Code</th>
<th>Task Description</th>
<th>Apprentice’s Signature and Date</th>
<th>Supervisor’s/Trainer’s Signature and Date</th>
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<tbody>
<tr>
<td>U5239.00</td>
<td><strong>PERFORM NUMERICALLY CONTROLLED (NC)/COMPUTERIZED NUMERICALLY CONTROLLED (CNC) MACHINING</strong> ...cont’d</td>
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<tr>
<td>U5539.08</td>
<td><strong>Position and align workpiece in NC/CNC machine</strong> to specified datums and required alignments, using chucks, face plates, collets, vises, clamps, stops, and fixtures to locate and position the workpiece, avoid collisions, and, ensure maximum stability during machining in accordance with Safety Legislation, manufacturer’s and job specifications.</td>
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<td>U5239.09</td>
<td><strong>Input and verify part program at NC/CNC machine controls</strong> by: performing a dry run; taking a test cut; interrupting machining; measuring and checking dimensions; making adjustments to machine feeds, speeds, and offsets; editing the program; taking a final cut; and, performing an inspection prior to the production run; to ensure that the dimensions, shape, and tolerances of the machined part conforms to CAD data, engineering drawings and job specifications.</td>
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<tr>
<td>U5239.10</td>
<td><strong>Store and record verified program</strong> on storage media including disks, hard copy, or tapes for future use, so that programs can be retrieved and available for repeat machining jobs in accordance with CAD data, engineering drawings and job specifications.</td>
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<td>U5239.11</td>
<td><strong>Verify tool sequence, tool path, and collision avoidance program</strong> by performing a dry run and editing program as required, to ensure that workpiece is machined in accordance with CAD data, engineering drawings, and job specifications.</td>
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<td>U5239.12</td>
<td><strong>Monitor NC/CNC machining process</strong></td>
<td>by interrupting machining, measuring or checking dimensions, and making adjustments to machine feeds, speeds, and offsets, so that the dimensions, shape, and tolerances of the machined workpiece are maintained during machining in conformance with CAD data, engineering drawings, and job specifications.</td>
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<td><strong>Make adjustments to tooling and offsets</strong></td>
<td>so that the displayed or modified offsets and tooling conform with CAD data, engineering drawings and job specifications.</td>
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<td><strong>Maintain material identification</strong></td>
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| U5239.17 | **Complete work documentation** including CAD data, tracking sheets, sign-off sheets, inspection reports or procedure sheets to record the finalization of jobs and to facilitate traceability of work-in-process, ensuring that all data is recorded accurately and clearly in accordance with engineering drawings, job specifications, and company standards/procedures. |

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| U5239.18 | **Practise good housekeeping** in the workplace by cleaning up spills or leaks, keeping work area clean and clear of obstructions, and storing tools or equipment, so that the potential for accident or injury is prevented and tools or equipment are in place and available in compliance with company standards/procedures and Safety Legislation. |

| Apprentice’s Signature and Date | Supervisor’s/Trainer’s Signature and Date |

Sponsor’s/Employer’s Name

Sponsor’s/Employer’s Signature
# GENERAL MACHINIST

## APPRENTICE RECORD

### APPRENTICE NAME (Print):

### SPONSOR/EMPLOYER INFORMATION

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### SUMMARY OF TRAINING

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Employer/Sponsor ___________________________ Date __________

Apprentices ___________________________ Date __________
### GENERAL MACHINIST

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Signatures of:

Employer/Sponsor  
Date

Apprentices  
Date
APPRENTICE COMPLETION FORM

APPRENTICE NAME

Print

Signature

Social Insurance Number

Skill Sets when completed should be signed by the Supervisor/Trainer and presented with this completion form to your local Apprenticeship Client Services Office. Any supporting documentation should also be attached.

_In-school Completed (Proof to be Provided)_
Yes (  ) No (  ) Not applicable (  )

Hours completed as Per Contract:
Yes (  ) No (  ) Not applicable (  )

SPONSOR/EMPLOYER INFORMATION

Name

Address

Telephone

E-mail Address

Signature of Signing Authority

You will be required to disclose this signed form to the Ministry of Training, Colleges and Universities in order to complete your program. The Ministry will use your personal information to administer and finance Ontario’s apprenticeship training system. For further information please see the notice/declaration for collection of personal information that is referenced in the table of contents of this training standard.