ONTARIO COLLEGE OF TRADES

ORDRE DES MÉTIERS DE L'ONTARIO

Apprenticeship Training Standard

Schedule of Training

Draftsperson – Tool & Die Design

Trade Code: 614C

Development Date: March 2000

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
TTY: 1-866-533-6339 or 416-325-4084.

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

Ontario

SCHEDULE OF TRAINING
APPRENTICESHIP TRADE

DRAFTSPERSON - TOOLING & DIE DESIGN - 614C

A. DESCRIPTION/DUTIES:

A **Draftsperson - Tooling and Die Design** performs some or all of the following duties:

* Develops and prepares engineering designs and drawings.
* Operates computer-aided design and drafting stations.
* Develops and prepares design sketches.
* Completes documentation packages and produce drawing sets.
* Checks and verifies design drawings.
* Writes technical reports.
* Checks prepared contracts and tender documents.
* Designs and produces simple to complex templates and patterns
* Designs mechanical equipment for tool and die manufacturing.
* Designs tooling for tooling, dies, and modifications.
* Designs components parts and attachments.

2. **Is knowledgeable in**:

- Occupational Health and Safety Act.
- Fire Codes and Regulations.
- Accident prevention and safe practices.
- Bio/Chemical Hazards and Hazardous materials.
- First Aid/CPR.
- Government regulations and protocols.
- Environmental legislation and protocols.
- Computer drafting and design techniques.
- Tooling and Die Making Technology

Benchmark Guideline Total Training Time Frames: (Min//Max) (On-The-Job and In-School) **6,000 - 8,000 hours**	**Company/Sector/IC Name:**
Originating TC/IC/PDSU _____ **Date** _____	**District Manager/PDSU Manager** _____ **Date** _____

Program Standards Approval	**Director's Approval**	**Assigned Trade Code**
By _____ **Date** _____	**By** _____ **Date** _____	**614C**

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SCHEDULE OF TRAINING
APPRENTICESHIP TRADE

DRAFTSPERSON - TOOLING AND DIE DESIGN - 614C

B. ON-THE-JOB TRAINING:

Unit No	PERFORMANCE OBJECTIVES (ON-THE-JOB SKILL SETS)
614C -1	**Demonstrate Safe Working Practices and Techniques** Recognize and handle potential health and safety hazards and hazardous materials; comply with government safety standards, regulations, policies and procedures; wear personal protective equipment and clothing; operate emergency safety equipment; maintain good housekeeping; use and maintain tools and equipment; assure protection from fire hazards; and in accordance with OHSA and company procedures. Follow environmental procedures and regulations. **Date** **Apprentice's Signature** **Sponsor's Signature** _____ _____ _____
614C -2	**Communicate Orally and Write Reports** Prepare and deliver oral reports to fellow workers, clients, supervisors, and contractors; prepare written reports for supervisory personnel and other departments; complete inventory requisitions for replacement parts and supplies; and communicate effectively in accordance with customer and company requirements. **Date** **Apprentice's Signature** **Sponsor's Signature** _____ _____ _____

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DRAFTSPERSON - TOOLING AND DIE DESIGN - 614C

B. ON-THE-JOB TRAINING (cont'd)

Unit No	PERFORMANCE OBJECTIVES (ON-THE-JOB SKILL SETS)
614C -3	**Demonstrate Drafting Principles** Demonstrate drafting skills and principles by using lines, views, projections, sections, dimensions, lettering, symbols, and sketches, in accordance with company requirements. **Date** _____ **Apprentice's Signature** _____ **Sponsor's Signature** _____
614C -4	**Perform Precision Measurements** Perform precision measurements; including CSAE and ASME conventions and standards, materials, numbering, threads, tolerances, machine fits, and surface finishes; detail mechanical fasteners and locking devices; detail assembly and installation drawings; perform measurement using required measuring and checking tools, manuals, and charts; in accordance with government regulations and company procedures. **Date** _____ **Apprentice's Signature** _____ **Sponsor's Signature** _____

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B. ON-THE-JOB TRAINING (cont'd)

Unit No	PERFORMANCE OBJECTIVES (ON-THE-JOB SKILL SETS)
614C -5	**Develop, Design, and Prepare Engineering Tool & Die Designs** **Develop and prepare engineering designs and drawings** by: using preliminary concepts and sketches; performing engineering calculations; interpreting specifications sheets and other data; researching appropriate data for manufacturing processes, production techniques, material applications, tooling requirements, metallurgical processes, schematics, heat treating processes, jigs and fixtures; machine designs and operations; non-destructive testing; welding, brazing, and soldering applications and techniques; and determining plastic or synthetic material applications. **Date** **Apprentice's Signature** **Sponsor's Signature** _____ _____ _____
614C -6	**Develop and Prepare Tooling & Die Design Sketches and Component/Part Drawings** **Design and produce sketches and drawings** for: simple-to-complex templates and patterns; assembly and disassembly drawings for dies, tools, jigs, fixtures, and gauges; drawings for mechanical equipment for cutting and forming tools; sketches for blanking, piercing, and forming dies; in accordance with engineering drawings, customer and manufacturer's specifications, and job requirements. **Date** **Apprentice's Signature** **Sponsor's Signature** _____ _____ _____
614C -7	**Complete Documentation Packages** **Complete documentation packages** by: checking dimensions, materials to be used, and assembly and disassembly of various parts and checking and verifying conformity of design drawings to specifications and design data. Write technical reports. Produce drawing sets. **Date** **Apprentice's Signature** **Sponsor's Signature** _____ _____ _____

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B. ON-THE-JOB TRAINING (cont'd)

Unit No	PERFORMANCE OBJECTIVES (ON-THE-JOB SKILL SETS)
614C -8	**Operate Computer-Aided Design and Drafting Stations** Prepare layouts, designs, and detailed drawings from sketches, notes and specifications, for application in manufacturing or other fields, using graphics terminal of a computer system. Review sketches and other data with engineering staff and make changes using conventional drafting techniques. Load disk or tape-drive units with selected data files and required programs. Use keyboard to retrieve and display required drawings and other graphics. Manipulate displayed graphics to develop designs or modify drawings. Input dimensions, locations, and other digitized geometric or analytic information. Redraw details and edit text. Verify drawings and store on disk. Reproduce finalized drawings, specified elevations, cross-sections, projections or other details in hard copy for engineering use. Produce dimensional information, codes, files, part identification, job times, and other programmed data as required. **Date** **Apprentice's Signature** **Sponsor's Signature** _____ _____ _____
614C -9	**Check Prepared Contract and Tender Documents** Examine drawings to check for errors and take corrective action. Use installation drawings to check procedures, numbering systems, notes, bills of material, and drawing changes. **Date** **Apprentice's Signature** **Sponsor's Signature** _____ _____ _____

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C. Off-the-Job Learning Outcomes:

CONTENT: (To be written in learning outcomes and benchmark timeframes). On successful completion on off-the-job (in-school) training, the apprentice will demonstrate the ability to:

- Drafting I - Introduction to blueprint reading and drafting.
- Drafting II - Assembly and Detailed drawings.
- Drafting III - Pictorial Drawings to enable 3D visualization and interpretation.
- Drafting IV - Study and Application of true position tolerance and dimension.
- Drafting V - Drawing and Detailing of outlines and working tool assemblies.
- Math I - Intensive review of arithmetic which includes addition, subtraction, multiplication of whole and mixed numbers, common and decimal fractions, linear and square measure, square root, ratio and proportions, percentages, and checking calculation by excess of nines.
- Math II - Fundamental operations with positive and negative numbers, grouping symbols, algebraic axioms, addition, factoring, fractions, fractional and lateral equations, exponents and radicals, linear systems of equations and quadratic equations.
- Math III - Geometry, trigonometry, and logarithms.
- Math IV - Trigonometry and shop applications.
- Math V - Compound angles.
- Engineering materials - Structure of iron and steel in the solid state, heat treatment, iron carbide equilibrium diagram, classification of steels, properties of metal alloys.
- Fluid Power I - Basic components of hydraulic systems and the basic laws and formulates involved in simple fluid power calculations.
- Electricity 200.
- Basic and Advanced CNC.
- Micro-based CAD I - Utilize the basic design module to generate 2D and 3D wire frame geometric models.
- CAD Product Design.
- CAD Surface Creation - Generate surface models from which volumes may be extrapolated, as well as construction, curves of intersection, providing a foundation for a finite element mesh generation, multi-axis machine and visualization.
- Technical communications.
- Tooling and Die Making technologies.

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C. Off-the-Job Learning Outcomes:

Source & Type (Specify in detail: block or day release; night school; in-plant; correspondence). 600 hours, 2 nights per week, 3 hrs per night, 3 semesters per year
Benchmark/Guideline Time-Frames of Off-The-Job/In-School Learning Outcomes: 600 hours theory
Funding
Performance Objectives and Learning Outcomes reached: **Date:** _____ **Sponsor/Trainer/Employer signature:** _____ **Apprentice signature:** _____

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.