



ONTARIO COLLEGE OF TRADES

ORDRE DES MÉTIERS DE L'ONTARIO

Apprenticeship
Training Standard

Schedule of Training

Surface Mount Assembler

Trade Code: 630B

Development Date: November 2011

<u>CONTENTS</u>	<u>PAGE</u>
Preface	1
Definitions	2
Important Directions to the Apprentice	4
Important Directions for the Sponsor/Employer & Supervisor/Trainer	4
Notice/Declaration for Collection of Personal Information	5
Roles and Responsibilities of Apprentice, Sponsor/Employer and Supervisor/Trainer	6
Skill Set Completion Form	8
Learning Outcome Completion Form	8
Apprentice Completion Form	9
<u>TRAINING CONTENT</u>	
A. Description/Duties	10
B. On-the-Job Training Performance Objectives	12
1.0	
C. Learning Outcomes	16
Apprentice Record	17

PREFACE

This Schedule of Training was developed by the Ministry of Training, Colleges, and Universities (MTCU), in partnership with the Industry Advisory Committee 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 skill 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 apprentices' acquisition of skills of the trade.

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 (www.collegeoftrades.ca) for the most accurate and up-to-date information about the College. For information on OCTAA and its regulations, please visit: www.collegeoftrades.ca/about/legislation-and-regulations.

DEFINITIONS

ACA

Apprenticeship and Certification Act, 1998

Certificate of Apprenticeship (C of A)

Certification issued to individuals who have demonstrated that they have completed an apprenticeship in Ontario.

Certificate of Qualification (C of Q)

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

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.

Competency Analysis Profile

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

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.

Journeyman 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.

Schedule of Training

An apprenticeship training standard which includes the on-the-job performance objectives and off-the-job learning outcomes

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 (and Learning Outcome 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 an 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 apprenticeship staff at the local Ministry of Training, Colleges and Universities 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 and Learning Outcome 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 Training Agreement.
4. The apprentice completion form with the Completed and Authorized Schedule of Training must be presented to the local Apprenticeship Client Services Unit.

Sponsors/Employers and Supervisors/Trainers

The Schedule of Training identifies skills and supporting learning outcomes required for this trade/occupation and its related training program.

This Schedule of Training has been written in concise statements which describe how an apprentice must perform each skill/outcome 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/Trainers 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
TTY: 1-866-533-6339 or 416-325-4084.

**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.

SURFACE MOUNT ASSEMBLER

SKILL SET COMPLETION FORM

SKILLS SETS	TITLE	SIGNING AUTHORITY
1.0		
2.0		
3.0		
4.0		
5.0		
6.0		
7.0		
8.0		
9.0		
10.0		
11.0		
12.0		
13.0		
14.0		
15.0		
16.0		
17.0		
18.0		
19.0		
20.0		
21.0		
22.0		

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 learning outcomes will cover all of the skill sets, both shaded and unshaded.

LEARNING OUTCOMES COMPLETION FORM

Date of Completion	Organization Name(s)	SIGNING AUTHORITY

APPRENTICE COMPLETION FORM

APPRENTICE NAME	
Print	
Signature	
Client ID	

Skill Sets and Learning Outcomes 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 Yes () No () Not applicable ()
 (Proof to be provided)

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.

A. DESCRIPTION/DUTIES

A **SURFACE MOUNT ASSEMBLER** may perform some of all of the following:

- Solder and manually bond or assemble various electronic components such as transistors, diodes, capacitors, integrated circuits, wires and other electronic parts.
- Install mount, fasten, align and adjust parts, components, to subassemblies and assemblies.
- Set-up, operate and monitor automatic and semi-automatic machines to position, solder/bond and clean prescribed components on printed circuit boards.
- Operate and monitor process equipment including automatic and semi-automatic machines to fabricate electronic components, solder, clean, seal and stamp components and perform other process operations as specified.
- Set-up process equipment and adhere to clean room procedures as required.
- Perform some or all of the following operations:
 - Inspect electronic components and assemblies to ensure correct component selection and placement, wiring and soldering quality, location, breaks in circuitry and line spacing in printed circuit boards and other specified requirements while products are being assembled or fabricated.
 - Check final assembly for finish, labelling and packaging methods.
 - Check product and perform "go - no-go" electrical tests.
 - Identify and mark acceptable and defective assemblies and return faulty assemblies to production for repair or dispose of same as required.
 - Collect, record and summarize inspection results.
- Operator may perform some or all of the following duties:
 - Operate various test equipment and tools to perform electrical continuity testing of electronic components, parts and systems.
 - May set-up and operate automatic testing equipment to locate circuit and wiring faults, shorts and component defects.
 - Compare test results to specifications and set parts or products aside for rework or replace components or parts as indicated by test equipment.
 - Maintain test results reports.
- Equipment operation may include:

pick and place	wave solder	microscope
screen printer	wire-bonding (auto & manual)	reflow oven
glue dispenser	component taping machines	rework machine
programming	component shaping machine	testing machines
inspection machine	conveyors	

SURFACE MOUNT ASSEMBLER

A **SURFACE MOUNT ASSEMBLER** demonstrates knowledge of:

-
-

**BENCHMARK/GUIDELINE TOTAL TRAINING TIMEFRAMES:
(ON-THE-JOB AND OFF-THE-JOB):**

hours

Includes **323** hours of in-school training

B. ON-THE-JOB PERFORMANCE OBJECTIVES

1.0 Work safely in a production environment by: following company procedures, wearing, adjusting and maintaining safety protective equipment, referencing the occupational health and safety act, and by working around various types of operating and stationary equipment.

_____	_____	_____
Date Completed	Apprentice	Supervisor/Trainer

2.0 Identify, ensure proper labelling and handle hazardous materials and store or dispose of same by following government and company regulations and procedures.

_____	_____	_____
Date Completed	Apprentice	Supervisor/Trainer

3.0 Use, maintain and store hand, power and pneumatic tools (vacuum, callipers, tweezers, inspection tools etc.) In the performance of job duties.

_____	_____	_____
Date Completed	Apprentice	Supervisor/Trainer

4.0 Practise communication skills (telephone, electronic mail, memos, reports, logs, verbal etc.) to ensure clear, concise, and accurate communication in the workplace.

_____	_____	_____
Date Completed	Apprentice	Supervisor/Trainer

5.0 Use computer skills to enter/access data, load/download data, edit/manipulate data in the performance of job responsibilities.

_____	_____	_____
Date Completed	Apprentice	Supervisor/Trainer

6.0 Demonstrate teamwork skills (inter-personal skills, problem solving and conflict resolution skills etc.) In the development and maintenance of an effective teamwork concept in the workplace.

Date Completed

Apprentice

Supervisor/Trainer

7.0 Maintain a clean and safe work station(s).

Date Completed

Apprentice

Supervisor/Trainer

8.0 Gather and interpret data (charts, graphs, technical information) and apply statistical analysis to ensure control and improvement of process(es).

Date Completed

Apprentice

Supervisor/Trainer

9.0 Confirm/check production schedule documentation and ensure that the required tools and equipment are available.

Date Completed

Apprentice

Supervisor/Trainer

10.0 Confirm standard operating procedures to ensure required job preparation including verification of revisions, prints and schematics, and engineering change orders.

Date Completed

Apprentice

Supervisor/Trainer

11.0 Ensure optimum production conditions by monitoring environmental conditions (temperature, humidity etc.) and by reporting any abnormalities to appropriate personnel.

Date Completed

Apprentice

Supervisor/Trainer

12.0 Ensure availability of equipment tools and supplies prior to setting up the process.

_____ Date Completed	_____ Apprentice	_____ Supervisor/Trainer
-------------------------	---------------------	-----------------------------

13.0 Confirm process parameters set-up by referencing required documentation.

_____ Date Completed	_____ Apprentice	_____ Supervisor/Trainer
-------------------------	---------------------	-----------------------------

14.0 Confirm standard operating procedures to ensure required process set-up including verification of revisions, prints and schematics, and engineering change orders.

_____ Date Completed	_____ Apprentice	_____ Supervisor/Trainer
-------------------------	---------------------	-----------------------------

15.0 Set up materials/equipment/tooling, hardware, fixtures and equipment and load required software to ensure standard that process procedures are in use.

_____ Date Completed	_____ Apprentice	_____ Supervisor/Trainer
-------------------------	---------------------	-----------------------------

16.0 Perform standard verification run to confirm standard operating procedures, the run shall include testing (electro, mechanical, chemical, callipers, microscope, destruct) and take corrective action for off-standard product/equipment.

_____ Date Completed	_____ Apprentice	_____ Supervisor/Trainer
-------------------------	---------------------	-----------------------------

17.0 Load product following standard operating procedures.

Note: It is expected that a trainee/worker will have an appreciation of the appropriate production process(es).

_____ Date Completed	_____ Apprentice	_____ Supervisor/Trainer
-------------------------	---------------------	-----------------------------

SURFACE MOUNT ASSEMBLER

18.0 Monitor process and take appropriate action for off-standard conditions.

Date Completed

Apprentice

Supervisor/Trainer

19.0 Troubleshoot malfunctioning equipment and/or off-standard product/process/ materials and take appropriate action (e.g. Shut down process and record and or report status to appropriate personnel)

Date Completed

Apprentice

Supervisor/Trainer

20.0 Ensure process returned to normal operating standard.

Date Completed

Apprentice

Supervisor/Trainer

21.0 Resume process operations and ensure that standard operating procedures are implemented.

Date Completed

Apprentice

Supervisor/Trainer

22.0 Inspect and/or test product and rework, touch up, dispose of "out of spec." Product and/or forward product to next stage and follow standard operating procedures.

Date Completed

Apprentice

Supervisor/Trainer

C. LEARNING OUTCOMES

1. (To be written in learning outcomes with performance indicators and benchmark timeframes). On successful completion on in-school (off-the-job) training, the apprentice will be able to:

323 Hours at CAATS

2. Source & Type - Specify in detail block or day release; night school; in-plant; correspondence
Block Release, Day Release - In-Plant

3. Benchmark/Guideline Time-frames of In-School/Off-The-Job Learning Outcomes:

323 Hours as per approved curriculum

4. Funding

Learning Outcomes Completion:

Date: _____

Training Delivery Agency (TDA) representative: _____

Apprentice Signature: _____

On-The-Job Performance Objectives Completion:

Date: _____

Sponsor/Employer Signature: _____

APPRENTICE RECORD

APPRENTICE NAME (Print):

SPONSOR/EMPLOYER INFORMATION	
Training Agreement #	
Name	
Address	
Telephone	
E-mail Address	

SUMMARY OF TRAINING	
Employment Start Date	
Employment End Date	
Total hours of training & instruction between dates of employment.	

Date Completed

Apprentice

Supervisor/Trainer

APPRENTICE RECORD

APPRENTICE NAME (Print):

SPONSOR/EMPLOYER INFORMATION	
Training Agreement #	
Name	
Address	
Telephone	
E-mail Address	

SUMMARY OF TRAINING	
Employment Start Date	
Employment End Date	
Total hours of training & instruction between dates of employment.	

Date Completed

Apprentice

Supervisor/Trainer

APPRENTICE RECORD

APPRENTICE NAME (Print):

SPONSOR/EMPLOYER INFORMATION	
Training Agreement #	
Name	
Address	
Telephone	
E-mail Address	

SUMMARY OF TRAINING	
Employment Start Date	
Employment End Date	
Total hours of training & instruction between dates of employment.	

Date Completed

Apprentice

Supervisor/Trainer