



**ONTARIO COLLEGE OF TRADES**  

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**ORDRE DES MÉTIERS DE L'ONTARIO**

Apprenticeship  
Training Standard

Schedule of Training

Process Operator  
Wood Products

Trade Code: 246W

Development Date: 2011

## PROCESS OPERATOR: WOOD PRODUCTS

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**PREFACE**

This Schedule of Training was developed by the Workplace Training Branch of 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 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.**

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>

**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 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 or 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 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**

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**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**

<b>SKILL SET</b>	<b>TITLE</b>	<b>SIGNING AUTHORITY</b>
<b>U6691.0</b>	Work Safely	
<b>U6692.0</b>	Employ job information resources	
<b>U6693.0</b>	Use and Maintain Tools and Equipment for Measuring, Testing, and Assessment	
<b>U6694.0</b>	Operate a Central Control Room	
<b>U6695.0</b>	Control Process Operations	
<b>U6696.0</b>	Monitor Process Equipment	
<b>U6697.0</b>	Control Process Materials	
<b>U6698.0</b>	Maintain Processing Equipment and Components	
<b>U6699.0</b>	Maintain Vessels	
<b>U6700.0</b>	Control Chemical Composition	
<b>U6701.0</b>	Maintain Equipment	
<b>U6702.0</b>	Carry Out Product Quality and Statistical Process Control	

**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**

<b>Date of Completion</b>	<b>Organization Name(s)</b>	<b>SIGNING AUTHORITY</b>

**APPRENTICE COMPLETION FORM**

<b>APPRENTICE NAME</b>	
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 ( )

<b>SPONSOR/EMPLOYER INFORMATION</b>	
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 **Process Operator: Wood Products** operates, monitors, adjusts and maintain wood processing systems and equipment. They are employed primarily by wood products and pulp & paper processing industries.

A **Process Operator: Wood Products** performs the following:

- Work Safely
- Employ job information resources
- Use and maintain tools and equipment for measuring, testing and assessment
- Operate a central control room
- Control process operations
- Monitor process equipment
- Control process materials
- Maintain processing equipment and components
- Maintain vessels
- Control chemical composition
- Maintain Equipment
- Carry out product quality and statistical process control

A **Process Operator: Wood Products** is knowledgeable in:

Mathematics	Valves
Instrumentation Control	Introduction to Equipment and Systems
Plant Science	Introduction to Processes and Operations
Piping and Auxiliaries	Compressors
Chemistry	Electrical Equipment
Process Operations	Environmental Protection
Troubleshooting	Heat Exchangers
Pumps	Operator Responsibilities
Reading Diagrams	Overhead Crane Operation

**BENCHMARK/GUIDELINE TOTAL TRAINING TIMEFRAMES: (ON-THE-JOB AND OFF-THE-JOB): 6000 - 7200 hours**

Includes a minimum of 720 hours of in-school or equivalent correspondence training.



**U6691.0      WORK SAFELY (cont'd):**

**U6691.05      Practice good housekeeping in the workplace** by ensuring that the workplace is clean, organized and free of obstructions, spills or fire hazards; that materials and equipment are cleaned and stored in designated areas after use and that protective barriers, ultraviolet shields and guards are erected so that accident or injury potential is minimized.

\_\_\_\_\_  
Date Completed

\_\_\_\_\_  
Apprentice

\_\_\_\_\_  
Supervisor/Trainer

**U6691.06      Apply lockout and tag procedures** and de-energizing procedures to electrical, mechanical, hydraulic and pneumatic equipment before commencing maintenance and overhaul, in accordance with the Canadian Electrical Code, Boiler Pressure Vessels Ontario Regulation 220/01, OHSA, manufacturers' instructions, and company policies and procedures.

\_\_\_\_\_  
Date Completed

\_\_\_\_\_  
Apprentice

\_\_\_\_\_  
Supervisor/Trainer

**U6692.0 EMPLOY JOB INFORMATION RESOURCES**

**U6692.01 Determine operation and maintenance requirements** by researching codes, manuals, manufacturers' specifications and recommendations, warranties, preventive maintenance schedule sheets and government regulations; identifying system and component types, capacities, tolerances and limitations, safety procedures, replacement procedures and in-house maintenance and licensing limitations; updating maintenance inspection routines and locating any other necessary information to complete the job in accordance with all regulations and company procedures.

\_\_\_\_\_  
Date Completed

\_\_\_\_\_  
Apprentice

\_\_\_\_\_  
Supervisor/Trainer

**U6692.02 Communicate with co-workers**, supervisors, company representatives and other tradespersons by personal communication, telephone, postal service/letter and e-mail, ensuring that information delivered is concise, clear and accurate and is in accordance with company procedures or practices.

\_\_\_\_\_  
Date Completed

\_\_\_\_\_  
Apprentice

\_\_\_\_\_  
Supervisor/Trainer

**U6692.03 Write work reports** including standard work documentation as well as safety reports, injury reports, environmental reports and maintenance charts by completing them manually or using a computer system, ensuring that written reports are concise, detailed, clear, accurate, and timely in accordance with company practices or procedures.

\_\_\_\_\_  
Date Completed

\_\_\_\_\_  
Apprentice

\_\_\_\_\_  
Supervisor/Trainer

**U6692.04 Maintain service documents** including service call sheets, work orders, work performance sheets, and log books, ensuring that all procedures and maintenance tasks are documented and recorded in accordance with employer's specifications and company procedures or practices.

\_\_\_\_\_  
Date Completed

\_\_\_\_\_  
Apprentice

\_\_\_\_\_  
Supervisor/Trainer

**U6693.0. USE AND MAINTAIN TOOLS AND EQUIPMENT FOR MEASURING, TESTING, AND ASSESSMENT**

**U6693.01** Use and maintain tools and equipment for measuring, testing, and assessment in accordance with manufacturers' specifications, government regulations, and company standards.

\_\_\_\_\_  
Date Completed

\_\_\_\_\_  
Apprentice

\_\_\_\_\_  
Supervisor/Trainer



**U6694.0 OPERATE A CENTRAL CONTROL ROOM**

**U6694.01 Run and monitor electronic or computerized control panels** in accordance with company standards and manufacturer's specifications.

\_\_\_\_\_  
Date Completed

\_\_\_\_\_  
Apprentice

\_\_\_\_\_  
Supervisor/Trainer

**U6694.02 Optimize physical and chemical processes** for several processing units in accordance with company standards and process requirements.

\_\_\_\_\_  
Date Completed

\_\_\_\_\_  
Apprentice

\_\_\_\_\_  
Supervisor/Trainer

**U6695.0 CONTROL PROCESS OPERATIONS**

**U6695.01 Start up and shut down process operations** in accordance with government and company procedures and standards.

\_\_\_\_\_  
Date Completed

\_\_\_\_\_  
Apprentice

\_\_\_\_\_  
Supervisor/Trainer

**U6695.02 Perform troubleshooting procedures on process operations** in accordance with company procedures.

\_\_\_\_\_  
Date Completed

\_\_\_\_\_  
Apprentice

\_\_\_\_\_  
Supervisor/Trainer

**U6696.0 MONITOR PROCESS EQUIPMENT**

**U6696.01 Monitor process equipment** including identifying poor equipment performance requiring corrective maintenance and identifying equipment instrument anomalies in accordance with government regulations and company procedures.

\_\_\_\_\_  
Date Completed

\_\_\_\_\_  
Apprentice

\_\_\_\_\_  
Supervisor/Trainer

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**PROCESS OPERATOR: WOOD PRODUCTS**

**U6697.0 CONTROL PROCESS MATERIALS**

**U6697.01 Unload raw materials** from tank trucks, railcars, and other containers by starting and stopping pumps and opening and closing valves in accordance with company procedures and standards.

\_\_\_\_\_  
Date Completed

\_\_\_\_\_  
Apprentice

\_\_\_\_\_  
Supervisor/Trainer

**U6697.02 Control transfer of component materials** from locations within the manufacturing operation to processing or manufacturing lines or from one line to another in accordance with company procedures and standards.

\_\_\_\_\_  
Date Completed

\_\_\_\_\_  
Apprentice

\_\_\_\_\_  
Supervisor/Trainer

**U6697.03 Load finished products** into appropriate transportation or to storage sites in accordance with company procedures and standards.

\_\_\_\_\_  
Date Completed

\_\_\_\_\_  
Apprentice

\_\_\_\_\_  
Supervisor/Trainer

**U6698.0 MAINTAIN PROCESSING EQUIPMENT AND COMPONENTS**

**U6698.01** **Maintain processing equipment and components**, such as distillation units, valves, pumps and controls, heat exchangers, piping systems, electrical systems, vacuum systems, evaporation units, and related field instrumentation, in accordance with manufacturer's specifications and company standards and specifications.

\_\_\_\_\_  
Date Completed

\_\_\_\_\_  
Apprentice

\_\_\_\_\_  
Supervisor/Trainer

**U6699.0      MAINTAIN VESSELS**

**U6699.01**      **Inspect** storage, mixing, blending, decanting, oxidation, hydrogenation, pressure, and vacuum vessels in accordance equipment maintenance requirements and company standards and specifications.

\_\_\_\_\_  
Date Completed

\_\_\_\_\_  
Apprentice

\_\_\_\_\_  
Supervisor/Trainer

**U6699.02**      **Clean and repair** storage, mixing, blending, decanting, oxidation, hydrogenation, pressure, and vacuum vessels in accordance with equipment maintenance requirements and company standards and specifications.

\_\_\_\_\_  
Date Completed

\_\_\_\_\_  
Apprentice

\_\_\_\_\_  
Supervisor/Trainer

**U6700.0 CONTROL CHEMICAL COMPOSITION**

**U6700.01 Identify chemical properties and chemical analyses** in accordance with required procedures and methods and company procedures and standards

\_\_\_\_\_  
Date Completed

\_\_\_\_\_  
Apprentice

\_\_\_\_\_  
Supervisor/Trainer

**U6700.02 Handle, store, and transfer chemicals** in accordance with government regulations and company procedures.

\_\_\_\_\_  
Date Completed

\_\_\_\_\_  
Apprentice

\_\_\_\_\_  
Supervisor/Trainer

**U6700.03 Prepare chemicals** through mixing, blending, and balancing them in accordance with standard procedures and company methods.

\_\_\_\_\_  
Date Completed

\_\_\_\_\_  
Apprentice

\_\_\_\_\_  
Supervisor/Trainer

**U6700.04 Monitor yields and balances** of chemical mixtures in accordance with standard procedures and methods.

\_\_\_\_\_  
Date Completed

\_\_\_\_\_  
Apprentice

\_\_\_\_\_  
Supervisor/Trainer

**U6701.0      MAINTAIN EQUIPMENT**

**U6701.1**      **Prepare for scheduled preventive maintenance** by identifying and scheduling time, date, and location; ensuring that all required material is on-site and verifying that all equipment controls and components are operational and functioning within design tolerances prior to sign-off of the on-site inspection in accordance with the preventive maintenance program and company procedures and practices.

\_\_\_\_\_  
Date Completed

\_\_\_\_\_  
Apprentice

\_\_\_\_\_  
Supervisor/Trainer



**PROCESS OPERATOR: WOOD PRODUCTS**

**U6702.0      CARRY OUT PRODUCT QUALITY AND STATISTICAL PROCESS CONTROL**

**U6702.01      Carry out product quality control** by sampling products, performing tests, recording data, and completing required documentation in accordance with company quality control and process control procedures and standards.

\_\_\_\_\_  
Date Completed

\_\_\_\_\_  
Apprentice

\_\_\_\_\_  
Supervisor/Trainer

**U6702.02      Carry out statistical process control** on process operations by completing control charts, analyzing operational variances and completing required documentation in accordance with company procedures and standards.

\_\_\_\_\_  
Date Completed

\_\_\_\_\_  
Apprentice

\_\_\_\_\_  
Supervisor/Trainer

**PROCESS OPERATOR: WOOD PRODUCTS**

**B. Learning Outcomes**

**PROCESS OPERATOR: WOOD PRODUCTS**

<b>BASIC LEVEL</b>		<b>HOURS</b>
S1681	Trades Calculations	32
S1682	Applied Science	32
S1683	Introduction to Chemistry	16
S1684	Electrical Fundamentals	24
S1685	Fundamentals of Process Control	32
S1686	Wood Products Technology	24
S1687	Industrial Drawings	24
S1688	Process Operations	56
<b>8 weeks</b>	<b>TOTAL</b>	<b>240</b>
<b>INTERMEDIATE LEVEL</b>		
S1689	Process Operations and Equipment	160
S1690	Electrical/Electronics	24
S1691	Chemistry	16
S1692	Communications	16
S1693	Machine Technology I	24
<b>8 weeks</b>	<b>TOTAL</b>	<b>240</b>
<b>ADVANCED LEVEL</b>		
S1694	Advanced Process Operations and Equipment	136
S1695	Advanced Electrical/Instrumentation	24
S1696	Environmental	16
S1697	Machine Technology II	32
S1698	Troubleshooting	32
<b>8 weeks</b>	<b>TOTAL</b>	<b>240</b>
<b>TOTAL (IN SCHOOL) PROGRAM HOURS</b>		<b>720</b>

**LEVEL ONE (BASIC)**

**8 Weeks - 240 Hours**

**S1681 - Trades Calculations – 32 hours**

1. Add, subtract, multiply, and divide whole numbers and apply these operations to trade related problems such as perimeter
2. Define proper and improper fractions, mixed numbers, lowest common denominator, brackets, and add, subtract, multiply and divide fractions
3. Measurement Concepts and the Metric Systems
4. Basic Algebraic Operations
5. Operations on Monomial and Binomial Expressions
6. Formula Rearrangement and Applications
7. Ratio, Proportion and Percent
8. Graphics of Simple Functions
9. Measurement of Angles
10. Trigonometric Functions
11. Solutions of Right Angles
12. Graph of Sine and Cosine Functions

**S1682 - Applied Science – 32 hours**

1. Atoms and Molecules
2. Properties of Solids
3. Properties of Liquids
4. Properties of Gases and Flowing Liquids
5. Internal (Thermal energy)
6. Force and Motion
7. Energy Work and Power
8. Simple Machines
9. Electricity and Magnetism
10. Wood Science
  - a. Structure and property of wood
  - b. Strength and testing

**S1683 - Introduction to Chemistry – 16 hours**

1. Chemistry Fundamentals
  - a. Define each term and explain the relationship between atoms, ions, elements, molecules, compounds and mixtures
  - b. Using the Periodic Table of elements determine the atomic numbers and the atomic masses of elements
2. Metallurgy and Materials
3. Corrosion Principles

**S1684 - Electrical Fundamentals – 24 hours**

1. Electrical Fundamentals: terms, properties, measurements and calculations
2. Electrical Test Equipment
3. Electrical Control Devices
4. Electrical Circuits
5. Power and Work
6. Conductors and insulators
7. Motors and Generators: AC and DC, operation
8. Electrical Distribution Circuits, Breakers, Switches and Fuses
9. Safe operation

**S1685 - Fundamentals of Process Control – 32 hours**

1. Process control concepts
2. Instrumentation terms and definitions
3. Introduction to digital control
4. Basic control loop components
5. Controls systems
6. Programmable logic computers (Programmable Logic Controls)
7. Input and output devices, data recording and storage
8. Methods of process measurement
  - a. Pressure, temperature, level and flow
  - b. Analytical
  - c. Basis weigh, brightness, opacity, moisture
9. Transmitters and transducers
10. Indicators and protective devices

**S1686 – Wood Products Technology – 24 hours**

1. Basic Hand and Power Tools
  - a. Identification
  - b. Tool selection
  - c. Safe Use and maintenance
2. Basic Measuring Devices
  - a. Identification
  - b. Tool selection
  - c. Safe use and accurate calibration
3. Basic Testing Devices for Processing Systems
  - a. Identification
  - b. Safe set up and testing
4. Introduction to Lumber Grading

**S1687 - Industrial Drawings – 24 hours**

1. Types of Technical Drawings
2. Reading Industrial Drawings
  - a. Assembly drawings
  - b. Schematics (Electrical/Instrumentation)
  - c. Piping Drawings
  - d. Symbols

**S1688 – Process Operations – 56 hours**

1. Operators Acts and Codes
  - a. Occupational Health & Safety Act
  - b. applicable regulations
  - c. CSA codes
2. Workplace Hazardous Materials (WHMIS)
  - a. Classification of controlled products
  - b. Labelling of controlled products
  - c. Materials safety data sheets
3. Environmental Terms and Definitions
4. Plant Safety
  - a. Cost and effect of workplace injuries
  - b. Personal protective equipment
  - c. Isolation of mechanical and electrical equipment
  - d. Confined space entry
  - e. Handling of gases and hydrocarbon fluids
  - f. Hydrogen sulphide safety
  - g. First aid, cpr and artificial respiration
  - h. Safety committees
  - i. Lock-out/tag-out procedures
5. Plant Fire Protection
  - a. Fire fundamentals and procedures
  - b. Fires and extinguishing methods
  - c. Portable fire extinguishers; construction and operation
  - d. Electrical fires
6. Radiation Protection
7. Introduction to International Standards
8. Sawmill Fundamentals
9. Operator Responsibilities
  - a. Control Room Operator
  - b. Data Collections
  - c. Production
  - d. Safety
  - e. Interpersonal

**LEVEL TWO (INTERMEDIATE)**

**8 Weeks - 240 Hours**

**S1689 - Process Operations and Equipment – 160 hours**

1. Introduction to Processes
2. Value-added Wood Manufacturing Plant Layout
3. Material Handling Systems
4. Sawmill Operations
5. Lumber Finishing and Saw Technology
6. Kiln Drying Equipment and Operations
7. Energy Systems
8. Planer Equipment and Operations
9. Milling Equipment and Operations

**S1690 - Electrical/Electronics – 24 hours**

1. Principles of Magnetism and Electromagnetism
2. Magnetic Devices: metering devices, voltmeters, ammeters, wattmeters
3. Capacitors, Inductors and Resistive Devices
4. AC Motors and Generators
5. DC Motors and Generators
6. Drives and Control

**S1691 – Chemistry – 16 hours**

1. Explain the formation of chemical compounds, explain typical reactions and apply basic principles to the balancing of chemical reactions
2. Define acids, bases, and salts and explain their properties
3. Define organic chemistry and explain the structure and applications of hydrocarbons and hydrocarbon derivatives
4. Explain typical applications of chemistry in industry, including water treatment and testing, corrosion, combustion, hydrocarbon processing, petrochemical and pulp and paper processes

**S1692 – Communications – 16 hours**

1. Essential Writing Skills for Trades
  - a. Logs
  - b. Reports
  - c. Purchase Orders

**S1693 - Machine Technology I – 24 hours**

1. Application of Tools and Equipment
2. Pumps
3. Valves
  - a. Types
  - b. Actuators
4. Piping and Auxiliaries
  - a. Types
  - b. Inspection and Operation
  - c. Safe Start-up and Shut-down
5. Compressors



**LEVEL THREE (ADVANCED)**

**8 Weeks - 240 Hours**

**S1694 - Advanced Process Operations and Equipment – 136 hours**

1. Plant Operations
2. Kiln Drying Process
3. Condenser Operations
4. Reboiler Operations
5. Energy Process and Management
6. Planer and Milling Operations
7. Maintenance and Lubrication Systems
8. Preventative Maintenance Procedures
9. Statistical Process Control
10. Wood Products Distribution

**S1695 - Advanced Electrical/Instrumentation – 24 hours**

1. PLC and DCS Control Systems
2. DCS/PLC Control Problem Solving Techniques

**S1696 – Environmental – 16 hours)**

1. Procedures and Protocols
2. Gas and noise pollution
3. Solid and liquid pollution
4. Potential environmental impact of liquids
5. Potential environmental impact of vapours
6. Potential environmental impact of operating facilities

**S1697 - Machine Technology II – 32 hours**

1. Heat Exchangers
2. Cooling Towers
3. Compressors
4. Rigging, Hoisting and Overhead Crane

**S1698 – Troubleshooting – 32 hours**

1. Troubleshooting
  - a. Introduction to process operations and troubleshooting
  - b. Process of elimination
  - c. Troubleshooting examples and procedures
2. Troubleshooting Control Systems

**APPRENTICE RECORD**

<b>APPRENTICE NAME (Print):</b>
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<b>SPONSOR/EMPLOYER INFORMATION</b>	
Training Agreement #	
Name	
Address	
Telephone	
E-mail Address	

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

\_\_\_\_\_  
Date Completed

\_\_\_\_\_  
Apprentice

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Supervisor/Trainer

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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.