



Value Added Wood Manufacturing

SKILLED PRODUCTION WORKER CURRICULUM FRAMEWORK and TRAINING OUTLINE

Approved by Industry

Developed by
North Pacific Metrics Inc.
Burnaby, B.C.

Table of Contents

Contents

How to Use this Document..... 1

Skilled Production Worker Credentialing Model 2

Skilled Production Worker Curriculum Modules 5

 Module 1: WOOD AS A MANUFACTURING MATERIAL – Solid Wood 5

 Module 2: VAW PRODUCTION PROCESSES 7

 Module 3: VAW QUALITY CONTROL SYSTEMS..... 9

 Module 4: VAW PRODUCTION BEST PRACTICES..... 11

 Module 5: VAW MANUFACTURING MACHINE MAINTENANCE..... 13

 Module 6: VAW MACHINE ADJUSTMENT FOR PRODUCTION 15

 Module 7: VAW SPECIALIZED SURFACE FINISHING 17

 Module 8: INSTALL VAW PRODUCTS AND COMPONENTS..... 19

 Module 9: ADVANCED VAW CUTTING MACHINE OPERATION 21

 Module 10: VAW COMPONENT DESIGN..... 23

 Module 11: VAW COMPOSITES AND ENGINEERED MATERIALS 25

 Module 12: ADVANCED VAW PLANER MACHINE OPERATION 27

 Module 13: GRIND AND SHARPEN VAW MACHINE TOOLS 29

 Module 14: VAW COMPONENT FABRICATION AND ASSEMBLY PROCESSES 31

 Module 15: ADVANCED VAW CNC ROUTING MACHINE OPERATION 33

 Module 16: CNC PROGRAMMING FOR VAW COMPONENT FABRICATION..... 35

How to Use this Document

This Curriculum Framework and Training Outline has been developed for the use of individuals from several different audiences. The table below describes how each section can be used by each intended audience.

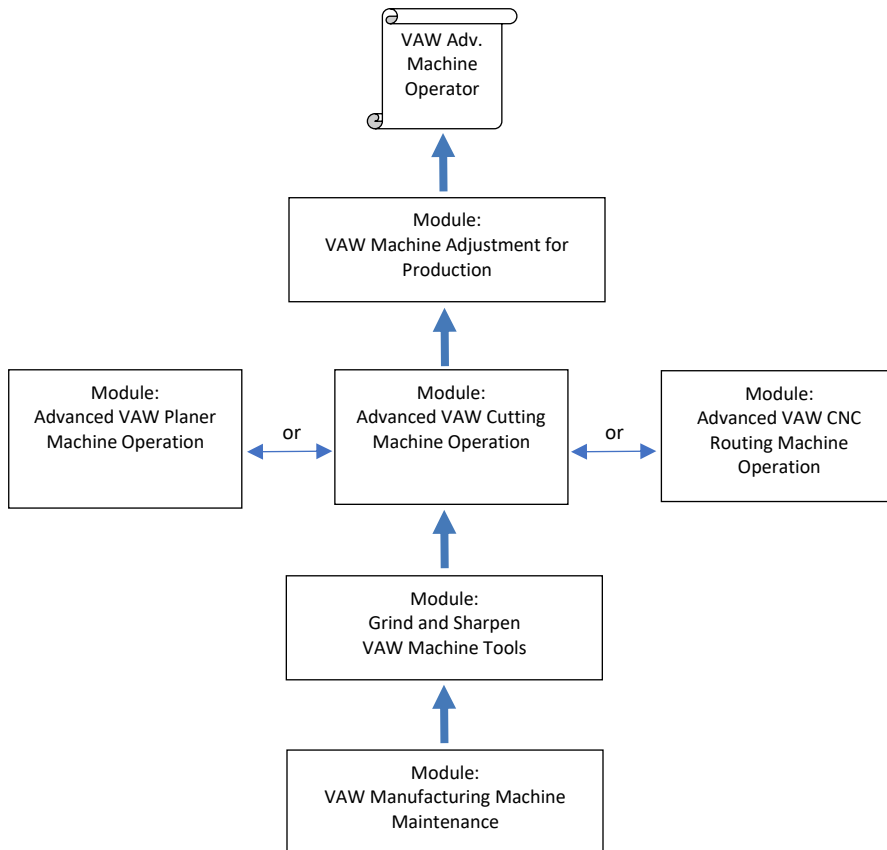
Section	Employers	Assessors / Trainers	VAW Workers
Program Credentialing Model	<p>Understand the structure of the SPW Program.</p> <p>Understand the SPW competencies that may be expected for each VAW Credential.</p>	<p>Understand the structure of the SPW Program.</p> <p>Understand the Competency Standards that underlie the SPW Program and the various pathways to credential recognition.</p>	<p>Understand the Competency Standards that underlie the SPW Program and the various pathways to credential recognition.</p>
Module Content	<p>Identifies the structure and content of the SPW Modules that are available to improve and recognize the competency of individual SPWs.</p>	<p>Identifies the SPW Competencies that are central to the content of each SPW Module.</p> <p>Defines the learning objectives and generic instructional design for each SPW Module. Identifies suggested learning resources related to the SPW Module content.</p>	<p>Provides detailed information on the content and expectations for each SPW Module.</p> <p>Identifies the learning outcomes that an SPW can expect to accomplish through participation in the Module.</p>

Skilled Production Worker Credentialing Model

The following graphics provide an overview of the Micro-credentialing Pathways for the Skilled Production Worker (SPW) occupation in British Columbia.

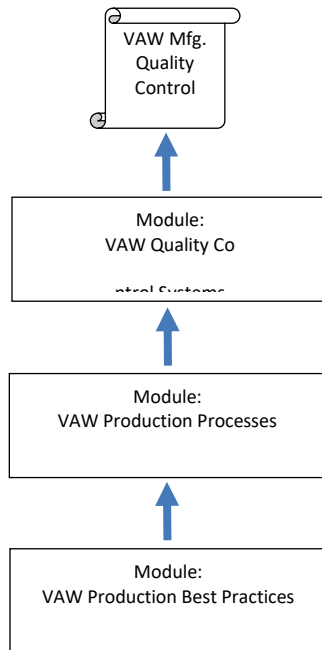
Credentialing Pathway #1:

Advanced VAW Machine Operator



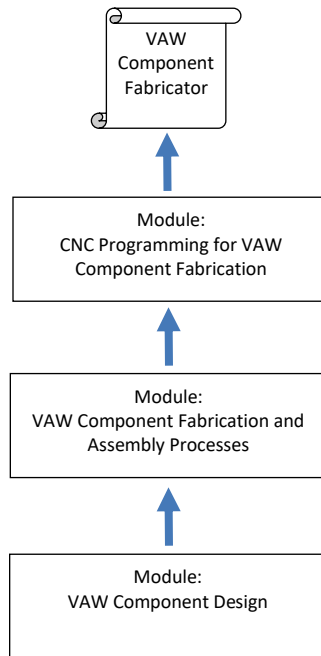
Credentialing Pathway #2:

VAW Production and Quality Control



Credentialing Pathway #3:

VAW Component Fabricator



Skilled Production Worker Curriculum Modules

Module 1: WOOD AS A MANUFACTURING MATERIAL – Solid Wood

Competency Area(s): ADVANCED MATERIALS (GAC – A)

Competencies:

- A1. Describe different types of wood
- A2. Identify different quality grades of wood
- A3. Describe various machining centres and processes

Relative Priority: 64.42% of Employer Survey respondents

SPW Learning Need Segmentation:

B.C. Regions	Value-Added Wood Sub-Sectors	
<input checked="" type="checkbox"/> Vancouver Island <input checked="" type="checkbox"/> Kootenays <input checked="" type="checkbox"/> Okanagan <input type="checkbox"/> Lower Mainland <input type="checkbox"/> North	<input type="checkbox"/> Cabinetry <input checked="" type="checkbox"/> Log & Timber <input type="checkbox"/> Pre-Built Housing <input checked="" type="checkbox"/> Millwork	<input checked="" type="checkbox"/> Remanufactured Wood Products <input type="checkbox"/> Furniture Manufacturing <input checked="" type="checkbox"/> Engineered Wood Products

Key Learning Objectives:

- Identify different types of wood based on visual characteristics – A1(1-2)
- Describe qualities, characteristics and common applications of different woods – A1(3-4)
- Describe different grades of wood – A2(1)
- Identify variations of wood within grades - A2(2)
- Describe the importance of moisture content - A2(3)
- Describe various wood machining centres and processes – A3(1-5)

Recommended Design (with estimated timing):

Assessor / Trainer consults with learners and employers in advance to identify specific materials and machining processes employed to aid in focusing the Module on specific learning needs.

- 1) Self-study / reading / preparation – 2 - 3 hours
- 2) Online synchronous webinar – 4 hours
 - (a) Could be recorded for additional cohorts

Suggested Pre-Requisite(s):

- None

Resources:

- Canadian Wood Council
- National Lumber Grades Authority - Lumber Grading Standards
- [The Wood Manufacturing Process: From Forest To Finish \(duffieldtimber.com\)](http://duffieldtimber.com)
- [Wood Defects - Forestry.queensu.ca](http://forestry.queensu.ca/forestry/wooddefects/)
- [Common Wood Defects: Types of Lumber Issues | Decks.com](http://decks.com/wood-defects/)
- [Wood Defects and How To Prevent Them - Bessemer](http://bessemer.com/wood-defects/)

Module 2: VAW PRODUCTION PROCESSES

Competency Area(s): PRODUCTION SYSTEMS (GAC – B)

PROCESS OPTIMIZATION (GAC – I)

- Competencies:**
- B1. Describe production processes
 - I2. Design production processes
 - I3. Optimize processes that incorporate automation

Relative Priority: 56.73% of Employer Survey respondents

SPW Learning Need Segmentation:

B.C. Regions	Value-Added Wood Sub-Sectors	
<input checked="" type="checkbox"/> Vancouver Island <input checked="" type="checkbox"/> Kootenays <input checked="" type="checkbox"/> Okanagan <input type="checkbox"/> Lower Mainland <input checked="" type="checkbox"/> North	<input checked="" type="checkbox"/> Cabinetry <input type="checkbox"/> Log & Timber <input checked="" type="checkbox"/> Pre-Built Housing <input checked="" type="checkbox"/> Millwork	<input checked="" type="checkbox"/> Remanufactured Wood Products <input type="checkbox"/> Furniture Manufacturing <input type="checkbox"/> Engineered Wood Products

Key Learning Objectives:

- Describe production inputs and outputs – B1(1)
- Describe precision measurement – B1(2)
- Describe fabrication and assembly processes – B1(3-4)
- Describe continuous process flow – B1(5)
- Design plant layout and production flow – I2(1)
- Develop inventory management system – I2(2)
- Optimize equipment usage and capacity – I2(3)
- Develop strategies to minimize waste – I2(4)
- Describe automation technologies – I3(1)
- Identify opportunities for automation in production processes – I3(2)
- Perform automation cost / benefit analysis – I3(3)

Recommended Design (with estimated timing):

Assessor / Trainer consults with learners and employers in advance to identify particular production and automation processes to aid in focusing the Module on specific learning needs.

- 1) Self-study / reading / preparation – 2 - 3 hours
- 2) Online synchronous webinar – 3.5 hours
 - (a) Could be recorded for additional cohorts
- 3) Independent research / planning exercise – variable
- 4) Individual coaching session – 1 hour
- 5) Self-study / reading / preparation – 2 - 3 hours
- 6) Online synchronous webinar – 3.5 hours
- 7) Community of practice – on-going

Suggested Pre-Requisite(s):

- VAW Production Best Practices

Resources:

- National Occupational Standard for Supervisor – Wood Manufacturing Council
- [Wood Manufacturing Process: A Complete Guide \(deskera.com\)](http://deskera.com)

Module 3: VAW QUALITY CONTROL SYSTEMS

Competency Area(s): PRODUCTION SYSTEMS (GAC – B)

PROCESS OPTIMIZATION (GAC – I)

Competencies: B2. Describe quality control systems

I4. Plan and implement quality control systems

Relative Priority: 54.81% of Employer Survey respondents

SPW Learning Need Segmentation:

B.C. Regions	Value-Added Wood Sub-Sectors	
<input checked="" type="checkbox"/> Vancouver Island <input checked="" type="checkbox"/> Kootenays <input type="checkbox"/> Okanagan <input type="checkbox"/> Lower Mainland <input checked="" type="checkbox"/> North	<input checked="" type="checkbox"/> Cabinetry <input checked="" type="checkbox"/> Log & Timber <input type="checkbox"/> Pre-Built Housing <input type="checkbox"/> Millwork	<input type="checkbox"/> Remanufactured Wood Products <input type="checkbox"/> Furniture Manufacturing <input checked="" type="checkbox"/> Engineered Wood Products

Key Learning Objectives:

- Describe quality control management – B2(1)
- Describe variance analysis techniques – B2(2)
- Describe control charting – B2(3)
- Describe continuous improvement – B2(4)
- Design and implement quality control systems – I4(1)
- Implement control charting – I4(2)
- Implement continuous improvement processes – I4(3)
- Apply variance analysis techniques – I4(4)

Recommended Design (with estimated timing):

Assessor / Trainer consults with learners and employers in advance to identify and prioritize specific quality problems and challenges to aid in focusing the Module on specific learning needs.

- 1) Self-study / reading / preparation – 2 - 3 hours
- 2) Online synchronous webinar – 3.5 hours
 - (a) Could be recorded for additional cohorts
- 3) Independent research / planning exercise – variable
- 4) Individual coaching session – 1 hour
- 5) Self-study / reading / preparation – 2 - 3 hours
- 6) Online synchronous webinar – 3.5 hours
- 7) Community of practice – on-going

Suggested Pre-Requisite(s):

- VAW Production Processes, and
- VAW Production Best Practices

Resources:

- National Occupational Standard for Supervisor – Wood Manufacturing Council
- [7 Basic Quality Tools: Quality Management Tools | ASQ](#)
- [Quality Control in Manufacturing | Basics and Best Practices \(machinometrics.com\)](#)
- [Best Practices for Wood Manufacturing Quality Control \(deskera.com\)](#)

Module 4: VAW PRODUCTION BEST PRACTICES

Competency Area(s): PRODUCTION SYSTEMS (GAC – B)

- Competencies:**
- B3. Identify production best practices
 - B4. Apply LEAN manufacturing principles

Relative Priority: 48.08% of Employer Survey respondents)

SPW Learning Need Segmentation:

B.C. Regions	Value-Added Wood Sub-Sectors	
<input type="checkbox"/> Vancouver Island <input type="checkbox"/> Kootenays <input checked="" type="checkbox"/> Okanagan <input type="checkbox"/> Lower Mainland <input checked="" type="checkbox"/> North	<input type="checkbox"/> Cabinetry <input checked="" type="checkbox"/> Log & Timber <input checked="" type="checkbox"/> Pre-Built Housing <input type="checkbox"/> Millwork	<input type="checkbox"/> Remanufactured Wood Products <input type="checkbox"/> Furniture Manufacturing <input type="checkbox"/> Engineered Wood Products

Key Learning Objectives:

- Describe plant layout and design considerations – B3(1)
- Describe inventory management – B3(2)
- Describe methods to optimize equipment usage and capacity – B3(3)
- Describe strategies to minimize waste – B3(4)
- Describe principles of LEAN manufacturing – B4(1)
- Identify opportunities for process improvement in operations – B4(2)
- Describe continuous improvement processes – B4(3)

Recommended Design (with estimated timing):

Assessor / Trainer consults with learners and employers in advance to identify specific production processes for emphasis to aid in focusing the Module on specific learning needs.

- 1) Self-study / reading / preparation – 2 - 3 hours
- 2) Online synchronous webinar – 3.5 hours
 - (a) Could be recorded for additional cohorts
- 3) Independent research / planning exercise – variable
- 4) Individual coaching session – 1 hour
- 5) Online synchronous webinar – 3.5 hours
- 6) Community of practice – on-going - based on shared challenges

Suggested Pre-Requisite(s):

- None

Resources:

- National Occupational Standard for Supervisor – Wood Manufacturing Council
- [Quality Management Practices Guide \(cdc.gov\)](#)
- [What is TIMWOODS? 8 Waste of Lean and How to Reduce Them - SixSigma.us \(6sigma.us\)](#)
- [Lean in the Wood Furniture Industry — ISSSP for Lean Six Sigma](#)

Module 5: VAW MANUFACTURING MACHINE MAINTENANCE

Competency Area(s): MANUFACTURING MACHINE MAINTENANCE (GAC – G)

- Competencies:**
- G1. Clean manufacturing machine
 - G2. Lubricate manufacturing machine
 - G5. Identify and apply relevant information from OEM documents

Relative Priority: 48.08% of Employer Survey respondents

SPW Learning Need Segmentation:

B.C. Regions	Value-Added Wood Sub-Sectors	
<input checked="" type="checkbox"/> Vancouver Island <input checked="" type="checkbox"/> Kootenays <input type="checkbox"/> Okanagan <input checked="" type="checkbox"/> Lower Mainland <input type="checkbox"/> North	<input checked="" type="checkbox"/> Cabinetry <input type="checkbox"/> Log & Timber <input type="checkbox"/> Pre-Built Housing <input checked="" type="checkbox"/> Millwork	<input type="checkbox"/> Remanufactured Wood Products <input type="checkbox"/> Furniture Manufacturing <input checked="" type="checkbox"/> Engineered Wood Products

Key Learning Objectives:

- Describe manufacturer’s recommended cleaning procedures of specific manufacturing machines – G1(1)
- Choose appropriate cleaning methods – G1(2)
- Disassemble parts to clean, as required – G1(3)
- Develop a regular cleaning plan – G1(4)
- Describe manufacturer’s recommended lubrication protocols for specific manufacturing machines – G2(1)
- Choose appropriate lubricants for specific manufacturing machines – G2(2)
- Identify appropriate lubrication frequency for specific manufacturing machines – G2(3)
- Employ lubrication best practices – G2(4)
- Access information in OEM documentation – G5(1)
- Identify critical spare parts to maintain on inventory – G5(2)
- Identify specifics of manufacturer’s warranty coverage – G5(3)

Recommended Design (with estimated timing):

Assessor / Trainer consults with learners and employers in advance to identify specific production machines for inclusion to aid in focusing the Module on specific learning needs.

- Self-study / reading / preparation – 2 - 3 hours
- Hands-on workshop in production / training facility with focus machine(s) – 7 hours
- Community of practice – on-going – based on focus machine(s)

Suggested Pre-Requisite(s):

- None

Resources:

- National Occupational Standard for Machine Operator – Wood Manufacturing Council
- Machine manufacturer(s) operator manual(s) and recommended maintenance procedures
- [Preventative Maintenance Tips for Woodworking Machines | Woodworking Network](#)
- [What Are The Care And Maintenance Of Woodwork Machines? - The Habit of Woodworking](#)

Module 6: VAW MACHINE ADJUSTMENT FOR PRODUCTION

Competency Area(s): MANUFACTURING MACHINE MAINTENANCE (GAC – G)

Competencies: G4. Adjust machining centre for optimum production

Relative Priority: 46.15% of Employer Survey respondents

SPW Learning Need Segmentation:

B.C. Regions	Value-Added Wood Sub-Sectors	
<input checked="" type="checkbox"/> Vancouver Island <input checked="" type="checkbox"/> Kootenays <input type="checkbox"/> Okanagan <input checked="" type="checkbox"/> Lower Mainland <input type="checkbox"/> North	<input checked="" type="checkbox"/> Cabinetry <input type="checkbox"/> Log & Timber <input type="checkbox"/> Pre-Built Housing <input checked="" type="checkbox"/> Millwork	<input checked="" type="checkbox"/> Remanufactured Wood Products <input type="checkbox"/> Furniture Manufacturing <input checked="" type="checkbox"/> Engineered Wood Products

Key Learning Objectives:

- Describe testing and QA procedures – G4(1)
- Calibrate machine for optimal performance – G4(2)
- Describe relationships between production output and quality control systems – G4(3)

Recommended Design (with estimated timing):

Assessor / Trainer consults with learners and employers in advance to identify specific manufacturing machine(s) to aid in focusing the Module on specific learning needs.

- Self-study / reading / preparation – 2 - 3 hours
- Hands-on workshop in production / training facility with focus machine(s) – 7 hours
- Community of practice – on-going – based on focus machine(s)

Suggested Pre-Requisite(s):

- Grind and Sharpen VAW Machine Tools, and
- VAW Manufacturing Machine Maintenance.
- Advanced VAW Planer Machine Operation, or
- Advanced VAW Cutting Machine Operation, or
- Advanced VAW CNC Routing Machine Operation.

Resources:

- National Occupational Standard for Machine Operator – Wood Manufacturing Council
- Machine manufacturer(s) operator manual(s)
- [The Wood Innovation Group \(TWIG\) Meetup | Centre for Advanced Wood Processing \(ubc.ca\)](#)

Module 7: VAW SPECIALIZED SURFACE FINISHING

Competency Area(s): SPECIALIZED FINISHING (GAC – D)

- Competencies:**
- D1. Identify specialized surface finishing requirements
 - D2. Select appropriate coating product
 - D3. Apply coating product
 - D4. Apply other surface treatments

Relative Priority: 41.35% of Employer Survey respondents

SPW Learning Need Segmentation:

B.C. Regions	Value-Added Wood Sub-Sectors	
<input type="checkbox"/> Vancouver Island <input type="checkbox"/> Kootenays <input checked="" type="checkbox"/> Okanagan <input checked="" type="checkbox"/> Lower Mainland <input checked="" type="checkbox"/> North	<input type="checkbox"/> Cabinetry <input checked="" type="checkbox"/> Log & Timber <input type="checkbox"/> Pre-Built Housing <input checked="" type="checkbox"/> Millwork	<input type="checkbox"/> Remanufactured Wood Products <input type="checkbox"/> Furniture Manufacturing <input checked="" type="checkbox"/> Engineered Wood Products

Key Learning Objectives:

- Describe wood finishing - D1(1)
- Describe colour theory and wood colour – D1(2)
- Describe surface preparation – D1(3)
- Select coating parameters and different coating products – D2(1&2)
- Handle coating products appropriately – D2(3)
- Spray coating products - D3(1)
- Describe conditions impacting application of coating product - D3(2)
- Control drying and curing processes - D3(3)
- Select and apply specialty wood finishes – D4(1&2)
- Implement quality control and finish testing – D4(3)

Recommended Design (with estimated timing):

Assessor / Trainer consults with learners and employers in advance to identify specific materials and surface finishing challenges to aid in focusing the Module on specific learning needs.

- Self-study / reading / preparation – 2 - 3 hours
- Hands-on workshop in production / training facility – 7 hours
- Community of practice – on-going – based on shared challenges

Suggested Pre-Requisite(s):

- Wood as a Manufacturing Material – Solid Wood, and / or
- VAW Composites and Engineered Products.

Resources:

- Centre for Advanced Wood Processing (UBC) Refinishing Program
- National Occupational Standard for Finisher – Wood Manufacturing Council

Module 8: INSTALL VAW PRODUCTS AND COMPONENTS

Competency Area(s): INSTALLATION (GAC – F)

- Competencies:**
- F1. Install interior products and components
 - F2. Install exterior products and components

Relative Priority: 41.35% of Employer Survey respondents

SPW Learning Need Segmentation:

B.C. Regions	Value-Added Wood Sub-Sectors	
<input type="checkbox"/> Vancouver Island <input type="checkbox"/> Kootenays <input checked="" type="checkbox"/> Okanagan <input checked="" type="checkbox"/> Lower Mainland <input checked="" type="checkbox"/> North	<input checked="" type="checkbox"/> Cabinetry <input checked="" type="checkbox"/> Log & Timber <input checked="" type="checkbox"/> Pre-Built Housing <input type="checkbox"/> Millwork	<input type="checkbox"/> Remanufactured Wood Products <input type="checkbox"/> Furniture Manufacturing <input type="checkbox"/> Engineered Wood Products

Key Learning Objectives:

- Read blueprints and technical drawings - F1(1) & F2(1)
- Describe relevant building codes and enactments – F1(2) & F2(2)
- Plan and install according to specifications – F1(4)
- Practice project site safety – F2(3)
- Determine site readiness for installation – F2(4)
- Inspect product upon arrival at site – F2(5)
- Describe building structure components – F2(6)

Recommended Design (with estimated timing):

Assessor / Trainer consults with learners and employers in advance to identify and prioritize specific installation problems and challenges to aid in focusing the Module on specific learning needs.

- 1) Self-study / reading / preparation – 3 - 4 hours
- 2) Online synchronous webinar – 3 - 4 hours
 - (a) Could be recorded for additional cohorts
- 3) Hands-on workshop at installation site or in training facility – 4 - 6 hours
- 4) Community of practice – on-going – based on shared challenges

Suggested Pre-Requisite(s):

- None

Resources:

- None identified

Module 9: ADVANCED VAW CUTTING MACHINE OPERATION

Competency Area(s): WORK CENTRE OPERATIONS (GAC – C)

Competencies: C6. Operate cutting machine for component fabrication

Relative Priority: 40.38% of Employer Survey respondents

SPW Learning Need Segmentation:

B.C. Regions	Value-Added Wood Sub-Sectors	
<input type="checkbox"/> Vancouver Island <input type="checkbox"/> Kootenays <input checked="" type="checkbox"/> Okanagan <input checked="" type="checkbox"/> Lower Mainland <input type="checkbox"/> North	<input type="checkbox"/> Cabinetry <input type="checkbox"/> Log & Timber <input checked="" type="checkbox"/> Pre-Built Housing <input type="checkbox"/> Millwork	<input checked="" type="checkbox"/> Remanufactured Wood Products <input type="checkbox"/> Furniture Manufacturing <input type="checkbox"/> Engineered Wood Products

Key Learning Objectives:

- Operate rip saws – C6(1)
- Operate resaws – C6(2)
- Operate chop saws – C6(3)
- Operate panel saws – C6(4)

Recommended Design (with estimated timing):

Assessor / Trainer consults with learners and employers in advance to identify specific cutting machine / materials challenges to aid in focusing the Module on specific learning needs.

1. Self-study / reading / preparation – 2 - 3 hours
2. Hands-on workshop in a production or training facility – 7 hours
3. Community of practice – on-going based on shared challenges

Suggested Pre-Requisite(s):

- Wood as a Manufacturing Material – Solid Wood, and / or
- Composites and Engineered Materials
- VAW Manufacturing Machine Maintenance
- Grind and Sharpen VAW Machine Tools

Resources:

- None identified

Module 10: VAW COMPONENT DESIGN

Competency Area(s): DESIGN TOOLS AND SYTEMS (GAC – H)

Competencies: H1. Prepare shop sketches and component designs
 H2. Use CAD/CAM system to design components

Relative Priority: 35.58% of Employer Survey respondents

SPW Learning Need Segmentation:

B.C. Regions	Value-Added Wood Sub-Sectors	
<input type="checkbox"/> Vancouver Island <input type="checkbox"/> Kootenays <input type="checkbox"/> Okanagan <input checked="" type="checkbox"/> Lower Mainland <input checked="" type="checkbox"/> North	<input type="checkbox"/> Cabinetry <input checked="" type="checkbox"/> Log & Timber <input checked="" type="checkbox"/> Pre-Built Housing <input checked="" type="checkbox"/> Millwork	<input type="checkbox"/> Remanufactured Wood Products <input type="checkbox"/> Furniture Manufacturing <input type="checkbox"/> Engineered Wood Products

Key Learning Objectives:

- Describe considerations for component design and sketches – H1(1)
- Enter drafting sketches into CAD program – H1(2)
- View and revise sketches and designs – H1(3)
- Create CAD drawings – H2(1)
- Program CAM for component fabrication based on CAD drawings – H2(2)

Recommended Design (with estimated timing):

Assessor / Trainer consults with learners and employers in advance to identify and prioritize specific component types and CAD/CAM systems to aid in focusing the Module on specific learning needs.

- 1) Self-study / reading / preparation – 2 - 3 hours
- 2) Online synchronous webinar – 3.5 hours
 - (a) Could be recorded for additional cohorts
- 3) Independent design / planning exercise – variable
- 4) Online synchronous webinar – 3.5 hours
- 5) Community of practice – on-going

Suggested Pre-Requisite(s):

- None

Resources:

- None identified

Module 11: VAW COMPOSITES AND ENGINEERED MATERIALS

Competency Area: ADVANCED MATERIALS (GAC – A)

Competencies: A4. Describe composites and other engineered materials
 A5. Describe machining processes for composites and other engineered materials

Relative Priority: 34.62% of Employer Survey respondents

SPW Learning Need Segmentation:

Regional Priority	Sub-Sector Priority	
<input type="checkbox"/> North <input checked="" type="checkbox"/> Kootenays <input type="checkbox"/> Okanagan <input type="checkbox"/> Lower Mainland <input checked="" type="checkbox"/> Vancouver Island	<input checked="" type="checkbox"/> Cabinetry <input type="checkbox"/> Log & Timber <input checked="" type="checkbox"/> Pre-Built Housing <input type="checkbox"/> Millwork	<input type="checkbox"/> Remanufactured Wood Products <input type="checkbox"/> Furniture Manufacturing <input checked="" type="checkbox"/> Engineered Wood Products

Key Learning Objectives:

- Describe structure and composition of engineered materials – A4(1)
- Identify different panel products – A4(2)
- Describe adhesives used in composites – A4(3)
- Describe laminating methods and products – A4(4)
- Describe veneer products – A4(5)
- Describe considerations in machining composites and engineered products – A5(1-4)

Recommended Design (with estimated timing):

Assessor / Trainer consults with learners and employers in advance to identify specific materials and machining processes to aid in focusing the Module on specific learning needs..

- 1) Self study / reading / preparation – 3 - 4 hours
- 2) Online synchronous webinar – 2 x 4 hours
 - (a) Could be recorded for additional cohorts

Suggested Pre-Requisite(s):

- None

Resources:

- WMC – Wood Manufacturing Council
- UBC – Centre for Advanced Wood Processing

Module 12: ADVANCED VAW PLANER MACHINE OPERATION

Competency Area: WORK CENTRE OPERATION (GAC – C)

Competency Topics: C1. Operate planing machine for component fabrication

Relative Priority: 34.62% of Employer Survey respondents

SPW Learning Need Segmentation:

Regional Priority	Sub-Sector Priority	
<input checked="" type="checkbox"/> North <input type="checkbox"/> Kootenays <input checked="" type="checkbox"/> Okanagan <input type="checkbox"/> Lower Mainland <input type="checkbox"/> Vancouver Island	<input type="checkbox"/> Cabinetry <input checked="" type="checkbox"/> Log & Timber <input checked="" type="checkbox"/> Pre-Built Housing <input type="checkbox"/> Millwork	<input checked="" type="checkbox"/> Remanufactured Wood Products <input type="checkbox"/> Furniture Manufacturing <input checked="" type="checkbox"/> Engineered Wood Products

Key Learning Objectives:

- Perform basic planing operations – C1(1)
- Adjust planer to perform planing tasks – C1(2)
- Perform basic preventive maintenance – C1(3)

Recommended Design (with estimated timing):

Assessor / Trainer consults with learners and employers in advance to identify specific planer machine / materials challenges to aid in focusing the Module on specific learning needs.

1. Self-study / reading / preparation – 2 - 3 hours
2. Hands-on workshop in a production or training facility – 7 hours
3. Community of practice – on-going based on shared challenges

Suggested Pre-Requisite(s):

- Wood as a Manufacturing Material – Solid Wood, and / or
- Composites and Engineered Materials.
- Grind and Sharpen VAW Machine Tools, and
- VAW Manufacturing Machine Maintenance.

Resources:

- None identified

Module 13: GRIND AND SHARPEN VAW MACHINE TOOLS

Competency Area: MANUFACTURING MACHINE MAINTENANCE (GAC – G)

Competency Topics: G3. Grind and sharpen machine tools

Relative Priority: 28.85% of Employer Survey respondents

SPW Learning Need Segmentation:

Regional Priority	Sub-Sector Priority	
<input type="checkbox"/> North <input checked="" type="checkbox"/> Kootenays <input checked="" type="checkbox"/> Okanagan <input type="checkbox"/> Lower Mainland <input checked="" type="checkbox"/> Vancouver Island	<input checked="" type="checkbox"/> Cabinetry <input type="checkbox"/> Log & Timber <input checked="" type="checkbox"/> Pre-Built Housing <input checked="" type="checkbox"/> Millwork	<input type="checkbox"/> Remanufactured Wood Products <input type="checkbox"/> Furniture Manufacturing <input type="checkbox"/> Engineered Wood Products

Key Learning Objectives:

- Disassemble cutting tools – G3(1)
- Describe sharpening requirements for cutting edges and cutting angles – G3(2)
- Grind and sharpen tools using a bench grinder – G3(3)
- Grind and sharpen tools using a profile grinder – G3(4)
- Grind and sharpen tools using a slow speed water wheel – G3(5)

Recommended Design (with estimated timing):

Assessor / Trainer consults with learners and employers in advance to identify specific planer machine / materials challenges to aid in focusing the Module on specific learning needs.

1. Self-study / reading / preparation – 2 - 3 hours
2. Hands-on workshop in a production or training facility – 7 hours
3. Community of practice – on-going based on shared challenges

Suggested Pre-Requisite(s):

- VAW Manufacturing Machine Maintenance

Resources:

- None identified

Module 14: VAW COMPONENT FABRICATION AND ASSEMBLY PROCESSES

Competency Area: DESIGN TOOLS AND SYSTEMS (GAC – H)

Competency Topics: H3. Design component fabrication and assembly processes

Relative Priority: 27.88% of Employer Survey respondents

SPW Learning Need Segmentation:

Regional Priority	Sub-Sector Priority	
<input checked="" type="checkbox"/> North <input type="checkbox"/> Kootenays <input checked="" type="checkbox"/> Okanagan <input type="checkbox"/> Lower Mainland <input type="checkbox"/> Vancouver Island	<input type="checkbox"/> Cabinetry <input checked="" type="checkbox"/> Log & Timber <input checked="" type="checkbox"/> Pre-Built Housing <input checked="" type="checkbox"/> Millwork	<input type="checkbox"/> Remanufactured Wood Products <input type="checkbox"/> Furniture Manufacturing <input type="checkbox"/> Engineered Wood Products

Key Learning Objectives:

- Translate component designs into fabrication and assembly processes – H3(1)
- Gather customer requirements and maintain engagement throughout process – H3(2)
- Perform 3D modeling – H3(3)
- Perform assembly modeling – H3(4)

Recommended Design (with estimated timing):

Assessor / Trainer consults with learners and employers in advance to identify and prioritize specific component types and assembly challenges to aid in focusing the Module on specific learning needs.

- 1) Self-study / reading / preparation – 2 - 3 hours
- 2) Online synchronous webinar – 3.5 hours
 - (a) Could be recorded for additional cohorts
- 3) Independent design / planning exercise – variable
- 4) Individual coaching session – 1 hour
- 5) Online synchronous webinar – 3.5 hours
- 6) Community of practice – on-going

Suggested Pre-Requisite(s):

- VAW Component Design

Resources:

- None identified

Module 15: ADVANCED VAW CNC ROUTING MACHINE OPERATION

Competency Area: WORK CENTRE OPERATION (GAC – C)

Competency Topics: C5. Operate CNC routing machine for component fabrication

Relative Priority: 26.92% of Employer Survey respondents

SPW Learning Need Segmentation:

Regional Priority	Sub-Sector Priority	
<input type="checkbox"/> North <input checked="" type="checkbox"/> Kootenays <input type="checkbox"/> Okanagan <input type="checkbox"/> Lower Mainland <input checked="" type="checkbox"/> Vancouver Island	<input type="checkbox"/> Cabinetry <input type="checkbox"/> Log & Timber <input checked="" type="checkbox"/> Pre-Built Housing <input checked="" type="checkbox"/> Millwork	<input type="checkbox"/> Remanufactured Wood Products <input type="checkbox"/> Furniture Manufacturing <input checked="" type="checkbox"/> Engineered Wood Products

Key Learning Objectives:

- Operate CNC 3-axis vacuum pod – C5(1)
- Operate CNC nested machine – C5(2)
- Operate CNC beam saw – C5(3)
- Operate CNC aggregate head machine – C5(4)
- Operate double end tenoner machine – C5(5)

Recommended Design (with estimated timing):

Assessor / Trainer consults with learners and employers in advance to identify specific CNC routing machine(s) to aid in focusing the Module on specific learning needs.

- 1) Self-study / reading / preparation – 2 - 3 hours
- 2) Online synchronous webinar – 3.5 hours
 - (a) Could be recorded for additional cohorts
- 3) Hands-on workshop in a production or training facility – 7 hours
- 4) Community of practice – on-going based on shared challenges

Suggested Pre-Requisite(s):

- Wood as a Manufacturing Material – Solid Wood, and / or
- Composites and Engineered Materials.
- VAW Manufacturing Machine Maintenance, and
- Grind and Sharpen VAW Machine Tools.

Resources:

- None identified

Module 16: CNC PROGRAMMING FOR VAW COMPONENT FABRICATION

Competency Area: PROCESS OPTIMIZATION (GAC – I)

Competency Topics: I1. Program CNC work centre for component fabrication

Overall Priority: 25.96% of Employer Survey respondents

SPW Learning Need Segmentation:

Regional Priority	Sub-Sector Priority	
<input checked="" type="checkbox"/> North <input checked="" type="checkbox"/> Kootenays <input type="checkbox"/> Okanagan <input type="checkbox"/> Lower Mainland <input checked="" type="checkbox"/> Vancouver Island	<input type="checkbox"/> Cabinetry <input type="checkbox"/> Log & Timber <input checked="" type="checkbox"/> Pre-Built Housing <input checked="" type="checkbox"/> Millwork	<input type="checkbox"/> Remanufactured Wood Products <input type="checkbox"/> Furniture Manufacturing <input type="checkbox"/> Engineered Wood Products

Key Learning Objectives:

- Generate CNC control file – I1(1)
- Edit and revise CNC program files – I1(2)
- Adjust and calibrate CNC machining processes – I1(3)

Key Learning Objectives:

- Generate CNC control file – I1(1)
- Edit and revise CNC program files – I1(2)
- Adjust and calibrate CNC machining processes – I1(3)

Recommended Design (with estimated timing):

Assessor / Trainer consults with learners and employers in advance to identify specific CNC work centre(s) to aid in focusing the Module on specific learning needs.

- 1) Self study / reading / preparation – 2 hours
- 2) Online synchronous webinar – 4 hours
 - (a) Could be recorded for additional cohorts
- 3) Community of practice – on-going based on shared challenges

Suggested Pre-Requisite(s):

- VAW Component Design, and
- VAW Component Fabrication and Assembly Processes

Resources:

- None identified