SKILLEDTRADES BC

PROGRAM OUTLINE

Cabinetmaker
(Joiner)

SKILLED TRADES BC

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CABINETMAKER (JOINER)

PROGRAM OUTLINE

APPROVED BY INDUSTRY

JUNE 2013

BASED ON

NOA 2012

Developed by
SkilledTradesBC
Province of British Columbia

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Section 1

INTRODUCTION

Cabinetmaker (Joiner)

Foreword

The revised Joiner Program Outline is intended as a guide for instructors, apprentices and employers of apprentices as well as for the use of industry organizations, regulatory bodies and provincial and federal governments. It reflects updated standards based on the new Cabinetmaker Occupational Analysis (2012) and British Columbia industry and instructor subject matter experts.

Practical instruction by demonstration and student participation should be integrated with classroom sessions. Safe working practices, even though not always specified in each operation or topic, are an implied part of the program and should be stressed throughout the apprenticeship

The Joiner Program Outline includes a list of recommended reference textbooks that are available to support the learning objectives and the minimum shop requirements needed to support instruction.

The Joiner Program Outline was prepared with the advice and assistance of the Joiner Review Committee and will form the basis for further updating of the British Columbia Joiner Program and learning resources by the Construction Industry Training Organization on behalf of SkilledTradesBC.

Each competency is to be evaluated through the use of written examination in which the learner must achieve a minimum of 70% in order to receive a passing grade. The type of questions used on these exams must reflect the cognitive level indicated by the learning objectives and the learning tasks listed in the related competencies.

Achievement Criteria are included for those competencies that require a practical component. The intent of including Achievement Criteria in the Program Outline is to ensure consistency in training across the many training institutions in British Columbia. Their purpose is to reinforce the theory and to provide a mechanism for evaluation of the learner's ability to apply the theory to practice. It is important that these performances be observable and measurable and that they reflect the skills spelled out in the competency as those required of a competent journeyperson. The conditions under which these performances will be observed and measured must be clear to the learner as well as the criteria by which the learner will be evaluated. The learner must also be given the level of expectation of success.

The performance spelled out in the Achievement Criteria is a suggested performance and is not meant to stifle flexibility of delivery. Training providers are welcome to substitute other practical performances that measure similar skills and attainment of the competency. Multiple performance may also be used to replace individual performance where appropriate.

SAFETY ADVISORY

Be advised that references to the WorkSafeBC safety regulations contained within these materials do not/may not reflect the most recent Occupational Health and Safety Regulation (the current Standards and Regulation in BC can be obtained on the following website: http://www.worksafebc.com). Please note that it is always the responsibility of any person using these materials to inform him/herself about the Occupational Health and Safety Regulation pertaining to his/her work.

Acknowledgements

The Program Outline was prepared with the advice and direction of an industry steering committee convened initially by the Construction Industry Training Organization. Members include:

- Dave Nesmith
- Greg Hesketh
- Dave Dunn
- Kevin Siggs
- Eric Wolfe

Industry Subject Matter Experts retained to assist in the development of Program Outline content:

- Dave Nesmith
- Greg Hesketh
- Dave Dunn
- Kevin Siggs
- Eric Wolfe
- Carl Catt
- Dave Stimson

Facilitators:

- Dave Coleman
- Laura Chaston

SkilledTradesBC would like to acknowledge the dedication and hard work of all the industry representatives appointed to identify the training requirements of the Cabinetmaker (Joiner) occupation.

How to Use this Document

This Program 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	Training Providers	Employers/ Sponsors	Apprentices	Challengers
Program Credentialing Model	Communicate program length and structure, and all pathways to completion	Understand the length and structure of the program	Understand the length and structure of the program, and pathway to completion	Understand challenger pathway to Certificate of Qualification
OAC	Communicate the competencies that industry has defined as representing the scope of the occupation	Understand the competencies that an apprentice is expected to demonstrate in order to achieve certification	View the competencies they will achieve as a result of program completion	Understand the competencies they must demonstrate in order to challenge the program
Training Topics and Suggested Time Allocation	Shows proportionate representation of general areas of competency (GACs) at each program level, the suggested proportion of time spent on each GAC, and percentage of time spent on theory versus practical application	Understand the scope of competencies covered in the technical training, the suggested proportion of time spent on each GAC, and the percentage of that time spent on theory versus practical application	Understand the scope of competencies covered in the technical training, the suggested proportion of time spent on each GAC, and the percentage of that time spent on theory versus practical application	Understand the relative weightings of various competencies of the occupation on which assessment is based
Program Content	Defines the objectives, learning tasks, high level content that must be covered for each competency, as well as defining observable, measureable achievement criteria for objectives with a practical component	Identifies detailed program content and performance expectations for competencies with a practical component; may be used as a checklist prior to signing a recommendation for certification (RFC) for an apprentice	Provides detailed information on program content and performance expectations for demonstrating competency	Allows individual to check program content areas against their own knowledge and performance expectations against their own skill levels
Training Provider Standards	Defines the facility requirements, tools and equipment, reference materials (if any) and instructor requirements for the program	Identifies the tools and equipment an apprentice is expected to have access to; which are supplied by the training provider and which the student is expected to own	Provides information on the training facility, tools and equipment provided by the school and the student, reference materials they may be expected to acquire, and minimum qualification levels of program instructors	Identifies the tools and equipment a tradesperson is expected to be competent in using or operating; which may be used or provided in a practical assessment

Section 2

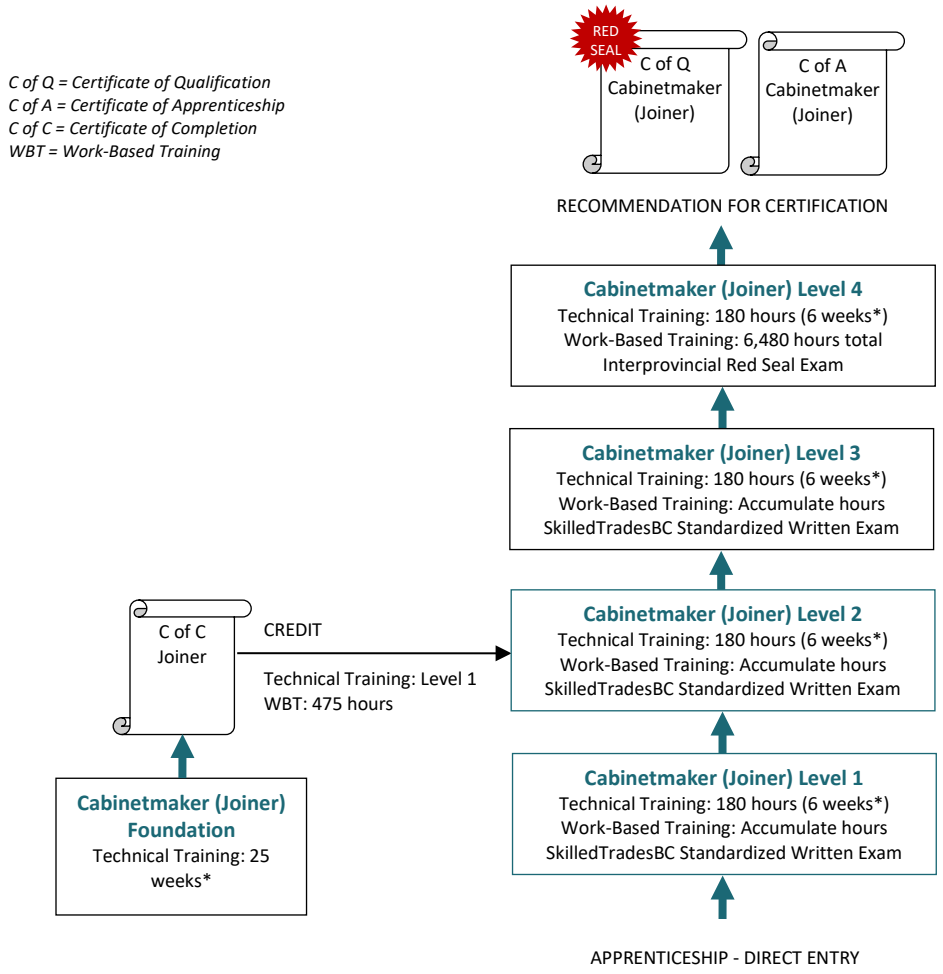
PROGRAM OVERVIEW

Cabinetmaker (Joiner)

Program Credentialing Model

Apprenticeship Pathway

This graphic provides an overview of the cabinetmaker (joiner) apprenticeship pathway



**Suggested duration based on 30-hour week*

CROSS-PROGRAM CREDITS

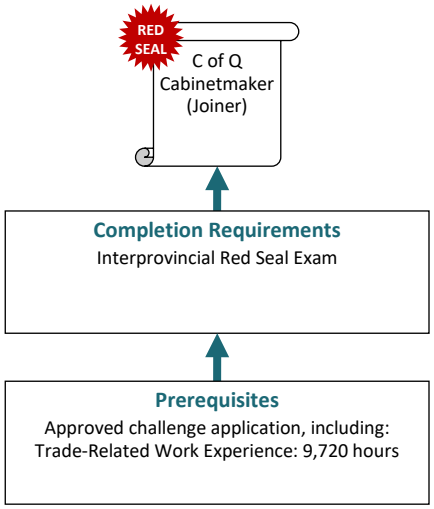
Individuals who hold the credentials listed below are entitled to receive partial credit toward the completion requirements of this program

None

Challenge Pathway

This graphic provides an overview of the Cabinetmaker (Joiner) challenge pathway.

C of Q = Certificate of Qualification



CREDIT FOR PRIOR LEARNING

Individuals who hold the credentials listed below are entitled to receive partial credit toward the completion requirements of this program

None

Occupational Analysis Chart

CABINETMAKER (JOINER)

Occupation Description: “Joiner” means a person who by manual and CAD layout or manual and CNC/CAM machines, assembles, installs and finishes articles that are fabricated with wood, plastic and other materials, and are intended to be used as architectural woodwork, millwork and furniture.

Competency	Task	Code	L1	L2	L3	L4	L5
USE SAFE WORK PRACTICES (A)	Apply Safe Work Practices	A1	1				
	Use WHMIS	A2	1				
USE ORGANIZATIONAL SKILLS (B)	Apply Standard Drafting Practices	B1	1				
	Apply Layout Techniques	B2	1	2	3	4	
	Prepare an Estimate	B3			3		
	Use Quality Standards	B4	1	2			
	Read Blueprints and Specifications	B5		2	3		
	Communicate with Others	B6	1				
	Apply Computer Skills	B7		2	3		
SELECT MATERIALS (C)	Describe the Structure and Properties of Wood	C1	1				
	Describe Lumber Production, Grading and Handling	C2	1				
	Select Solid Wood Species	C3	1	2	3		
	Select Types of Plywood	C4	1				
	Select Types of Composition Board	C5	1				
	Select Plastic Laminates	C6	1				
	Describe Specialty Materials	C7	1				
	Select Adhesives and Sealants	C8	1				
	Select Hardware	C9	1	2			
	Handle Materials	C10	1				

Program Overview

USE HAND TOOLS **D**	Use Basic Hand Tools D1	1	2		
	Use Specialized Hand Tools D2			3	
USE PORTABLE POWER TOOLS **E**	Use Power Sources E1	1			
	Use Portable Power Saws E2	1			
	Use Portable Power Drills and Screw Guns E3	1			
	Use Portable Edge-Cutting Tools E4	1			
	Use Portable Power Sanders E5	1			
	Use Portable Power Fastening Tools E6	1			
	Use Powder-Actuated Tools E7				4
USE WOODWORKING MACHINES **F**	Use Breakout Procedures F1	1			
	Use the Radial-Arm Saw F2	1			
	Use the Table Saw F3	1			
	Use the Jointer F4	1			
	Use the Thickness Planer F5	1			
	Use the Panel Saw F6		2		
	Use Band and Scroll Saws F7	1			
	Use Drilling and Boring Machines F8	1	2	3	
	Use Mortising and Tenoning Machines F9		2		
	Use Routing Machines F10	1	2	3	
	Use Sanding Machines F11	1		3	
	Use the Shaper and Power-Feed Attachment F12			3	4
	Use Edge-Banding Machines F13	1	2		
	Use the Lathe F14	1			
	Describe Production Machinery F15			3	

Program Overview

USE CNC MACHINES G	Use a CNC Machining Centre G1		4		
	Use a CNC Panel Saw G2		3		
	Use Optimization Software G3		3		
ASSEMBLE PRODUCTS H	Use Hand-Operated Clamps H1	1			
	Use Clamping and Pressing Machines H2		3	4	
	Use Assembly Techniques H3	1	2		
	Prepare Products for Shipping H4	1			
CONSTRUCT SPECIALTY ITEMS I	Construct Sashes, Doors and Frames I1		2		
	Construct a Staircase I2		3		
	Bend Wood and Composite Material I3		3		
	Fabricate a Veneered Panel I4			4	
	Describe Woodwork Restoration I5			4	
APPLY A FINISH J	Prepare Wood Surfaces for Finishing J1	1			
	Select Finishing Materials J2			4	
	Perform Finishing Operations J3			4	
INSTALL ARCHITECTURAL MILLWORK K	Install Cabinets and Countertops K1			4	
	Install Specialty Products K2			4	
APPLY JOINERY PRINCIPLES L	Apply Joinery Principles L1			4	

Training Topics and Suggested Time Allocation

Cabinetmaker (Joiner) – Level 1

			% of Time Allocated to:		
		% of Time	Theory	Practical	Total
Line A	**Use Safe Work Practices**	**5%**	**100%**	**0%**	**100%**
A1	Apply Safe Work Practices		✓		
A2	Use WHMIS		✓		
Line B	**Use Organizational Skills**	**19%**	**50%**	**50%**	**100%**
B1	Apply Standard Drafting Practices		✓		
B2	Apply Layout Techniques		✓	✓	
B4	Use Quality Standards		✓		
B6	Communicate with Others		✓		
Line C	**Select Materials**	**18%**	**60%**	**40%**	**100%**
C1	Describe the Structures and Properties of Wood		✓		
C2	Describe Lumber Production, Grading and Handling		✓		
C3	Select Solid Wood Species		✓	✓	
C4	Select Types of Plywood		✓		
C5	Select Types of Composition Board		✓		
C6	Select Plastic Laminates		✓		
C7	Describe Specialty Materials		✓		
C8	Select Adhesives and Sealants		✓		
C9	Select Hardware		✓		
C10	Handle Materials		✓		
Line D	**Use Hand Tools**	**7%**	**5%**	**95%**	**100%**
D1	Use Basic Hand Tools		✓	✓	
Line E	**Use Portable Power Tools**	**7%**	**30%**	**70%**	**100%**
E1	Use Power Sources		✓		
E2	Use Portable Power Saws		✓	✓	
E3	Use Portable Power Drills and Screw Guns		✓	✓	
E4	Use Portable Edge Cutting Tools		✓	✓	
E5	Use Portable Power Sanders		✓	✓	
E6	Use Portable Power Fastening Tools		✓	✓	
Line F	**Use Woodworking Machines**	**22%**	**20%**	**80%**	**100%**
F1	Use Breakout Procedures		✓	✓	
F2	Use the Radial-Arm Saw		✓	✓	
F3	Use the Table Saw		✓	✓	
F4	Use the Jointer		✓	✓	
F5	Use the Thickness Planer		✓	✓	
F7	Use Band and Scroll Saws		✓	✓	
F8	Use Drilling and Boring Machines			✓	
F10	Use Routing Machines		✓	✓	
F11	Use Sanding Machines		✓	✓	
F13	Use Edge-Banding Machines		✓	✓	

			% of Time Allocated to:		
		% of Time	Theory	Practical	Total
F14	Use the Lathe		✓	✓	
Line H	**Assemble Products**	**19%**	**10%**	**90%**	**100%**
H1	Use Hand-Operated Clamps		✓	✓	
H3	Use Assembly Techniques		✓	✓	
H4	Prepare Products for Shipping		✓		
Line J	**Apply a Finish**	**3%**	**20%**	**80%**	**100%**
J1	Prepare Wood Surfaces for Finishing		✓	✓	
	Total Percentage for Cabinetmaker (Joiner) Level 1	**100%**			

Training Topics and Suggested Time Allocation

Cabinetmaker (Joiner) – Level 2

			% of Time Allocated to:		
		% of Time	Theory	Practical	Total
Line B	**Use Organizational Skills**	**33%**	**50%**	**50%**	**100%**
B2	Apply Layout Techniques		✓	✓	
B4	Use Quality Standards		✓	✓	
B5	Read Blueprints and Specifications		✓		
B7	Apply Computer Skills		✓	✓	
Line C	**Select Materials**	**9%**	**60%**	**40%**	**100%**
C3	Select Solid Wood Species		✓	✓	
C9	Select Hardware		✓		
Line D	**Use Hand Tools**	**12%**	**10%**	**90%**	**100%**
D1	Use Basic Hand Tools		✓		
Line F	**Use Woodworking Machines**	**14%**	**20%**	**80%**	**100%**
F6	Use the Panel Saw		✓	✓	
F8	Use Drilling and Boring Machines		✓	✓	
F9	Use Mortising and Tenoning Machines		✓	✓	
F10	Use Routing Machines		✓	✓	
F13	Use Edge-Banding Machines		✓	✓	
Line H	**Assemble Products**	**21%**	**10%**	**90%**	**100%**
H3	Use Assembly Techniques		✓	✓	
Line I	**Construct Specialty Items**	**11%**	**55%**	**45%**	**100%**
I1	Construct Sashes, Doors and Frames		✓		
	Total Percentage for Cabinetmaker (Joiner) Level 2	**100%**			

Training Topics and Suggested Time Allocation

Cabinetmaker (Joiner) – Level 3

			% of Time Allocated to:		
		% of Time	Theory	Practical	Total
Line B	**Use Organizational Skills**	**34%**	**40%**	**60%**	**100%**
B2	Apply Layout Techniques		✓	✓	
B3	Prepare an Estimate		✓	✓	
B5	Read Blueprints and Specifications		✓	✓	
B7	Apply Computer Skills		✓	✓	
Line C	**Select Materials**	**6%**	**70%**	**30%**	**100%**
C3	Select Solid Wood Species		✓	✓	
Line D	**Use Hand Tools**	**8%**	**5%**	**95%**	**100%**
D2	Use Specialized Hand Tools		✓	✓	
Line F	**Use Woodworking Machines**	**11%**	**15%**	**85%**	**100%**
F8	Use Drilling and Boring Machines		✓	✓	
F10	Use Routing Machines		✓	✓	
F11	Use Sanding Machines		✓		
F12	Use the Shaper and Power-Feed Attachment		✓	✓	
F15	Describe Production Machinery		✓		
Line G	**Use CNC Machining**	**4%**	**25%**	**75%**	**100%**
G2	Use a CNC Panel Saw		✓		
G3	Use Optimization Software		✓	✓	
Line H	**Assemble Products**	**6%**	**10%**	**90%**	**100%**
H2	Use Clamping and Pressing Machines		✓	✓	
Line I	**Construct Specialty Items**	**31%**	**100%**	**0%**	**100%**
I2	Construct a Staircase		✓		
I3	Bend Wood and Composite Materials		✓		
	Total Percentage for Cabinetmaker (Joiner) Level 3	**100%**			

Training Topics and Suggested Time Allocation

Cabinetmaker (Joiner) – Level 4

			% of Time Allocated to:		
		% of Time	Theory	Practical	Total
Line B	**Use Organizational Skills**	**6%**	**100%**	**0%**	**100%**
B2	Apply Layout Techniques		✓		
Line E	**Use Portable Power Tools**	**1%**	**100%**	**0%**	**100%**
E7	Use Powder Actuated Tools		✓		
Line F	**Use Woodworking Machines**	**9%**	**15%**	**85%**	**100%**
F12	Use the Shaper and Power-Feed Attachment		✓	✓	
Line G	**Use CNC Machining**	**13%**	**100%**	**0%**	**100%**
G1	Use a CNC Machining Centre		✓		
Line H	**Assemble Products**	**7%**	**15%**	**85%**	**100%**
H2	Use Clamping and Pressing Machines		✓	✓	
Line I	**Construct Specialty Items**	**14%**	**100%**	**0%**	**100%**
I4	Fabricate a Veneered Panel		✓		
I5	Describe Woodwork Restoration		✓		
Line J	**Apply a Finish**	**15%**	**100%**	**0%**	**100%**
J2	Select Finishing Materials		✓		
J3	Perform Finishing Operations		✓		
Line K	**Install Architectural Millwork**	**2%**	**100%**	**0%**	**100%**
K1	Install Cabinets and Countertops		✓		
K2	Install Specialty Products		✓		
Line L	**Apply Joinery Principles**	**33%**	**30%**	**70%**	**100%**
L1	Apply Joinery Principles		✓	✓	
	Total Percentage for Cabinetmaker (Joiner) Level 4	**100%**			

Section 3

PROGRAM CONTENT

Cabinetmaker (Joiner)

Level 1

Cabinetmaker (Joiner)

Line (GAC): A USE SAFE WORK PRACTICES

Competency: A1 Apply Safe Work Practices

Objectives

To be competent in this area, the individual must be able to:

- Apply safe work habits for the joinery shop.
- Apply fire prevention and fire control procedures.
- Use proper handling procedures for joinery shop materials.
- Describe the Workers' Compensation Board (WCB) regulations relevant to the joinery trade.

LEARNING TASKS	CONTENT
1. Describe safe work habits	• General rules • Dress, jewellery, hair • Footwear • Headcovering • Eye and face protection • Hand and arm protection • Hearing protection • Breathing protection • Shop environment and housekeeping • Lifting and moving
2. Describe fire prevention and control	• Handling flammable liquids • Electrical wiring • Combustible materials • Dealing with fire • Fire extinguishers • Types • Procedures • Fire drill • Fire suppression systems
3. Describe material handling procedures and equipment	• Dolly • Pump truck • Fork lift
4. Describe Occupational Health & Safety (OHS) regulation WCB standards	• WorkSafeBC responsibilities • Employer's responsibilities • Employer's costs • Worker's responsibilities

LEARNING TASKS	CONTENT
	• Occupational health and safety committees • Reporting an injury • Reporting an accident
5. Apply safe work practices	• Work habits • Fire prevention • Material handling • Standards and regulations

Line (GAC): A USE SAFE WORK PRACTICES

Competency: A2 Use WMHIS

Objectives

To be competent in this area, the individual must be able to:

- Describe the purpose of Workplace Hazardous Materials Information System (WHMIS) Regulations.
- Explain the contents of Material Safety Data Sheets (MSDS).
- Explain the contents of a WHMIS label.
- Apply WHMIS regulations.

LEARNING TASKS	CONTENT
1. State the legislation that requires suppliers of hazardous materials to provide MSDSs and label products as a condition of sale and importation	• Hazardous Product Act • Controlled Products Regulations • Ingredient Disclosure List • Hazardous Materials Information Review Act • Hazardous Materials Information Review Regulations

2. State the purpose of the Workplace Hazardous Materials Information System (WHMIS)	• Protection of Canadian workers from the adverse effects of hazardous materials through the provision of relevant information while minimizing the economic impact on industry and the disruption of trade
	• Recognition of rights
	  ○ Workers
	  ○ Employers
	  ○ Suppliers
	  ○ Regulators

3. Describe the key elements of WHMIS	• Material safety data sheets (MSDSs) • Labelling of containers of hazardous materials • Worker education programs

4. Describe the responsibilities of suppliers under WHMIS	• Provide
	  ○ MSDSs
	  ○ Labels

5. Describe the responsibilities of employers under WHMIS	• Provide
	  ○ MSDSs
	  ○ Labels
	• Work education programs in the workplace

LEARNING TASKS	CONTENT
6. Describe information to be disclosed on a MSDS	• Hazardous ingredients • Preparation information • Product information • Physical data • Fire or explosion • Reactivity data • Toxicological properties • Preventive measures • First-aid measures

7. Identify symbols found on WHMIS labels and their meaning	• Compressed gases
	• Flammable and combustible materials
	• Oxidizing materials
	• Poisonous and infectious materials
	  ○ Materials causing immediate and serious toxic effects
	  ○ Materials causing other toxic effects
	  ○ Biohazardous infectious materials
	• Corrosive materials
	• Dangerously reactive materials

8. Apply WHMIS regulations as they apply to hazardous materials used in the shop	• Use, storage and disposal of materials

Line (GAC): B USE ORGANIZATIONAL SKILLS

Competency: B1 Apply Standard Drafting Practices

Objectives

To be competent in this area, the individual must be able to:

- Produce orthographic, isometric, cabinet oblique and perspective drawings.
- Use standard lines and lettering, scale drawings, and apply standard dimensioning practice.

LEARNING TASKS	CONTENT
1. Use standard lines and letters used on drawings	• The alphabet of lines • Standard lettering
2. Describe orthographic drawings	• Top views • Front views • End views
3. Describe pictorial drawings	• Isometric drawings • Cabinet oblique drawings • Perspective drawings

4. Produce a shop drawing	• Dimensioning
	• Scales
	  ○ Imperial
	  ○ Metric

Line (GAC): B USE ORGANIZATIONAL SKILLS

Competency: B2 Apply Layout Techniques

Objectives

To be competent in this area, the individual must be able to:

- Reproduce an existing shop drawing.
- Produce a cutting bill,cutting plan and perform quantity and cost calculations for lumber and sheet goods.

LEARNING TASKS	CONTENT

1. Describe types and uses of shop drawings	• How shop drawings are produced and used
	  • Types of shop drawings
	  • Rod layout
	  • Full size layout
	  • Modified full-size layout
	  ○ Templates
	• Scaled layout

2. Describe procedures for producing shop drawings	• Preparing a rod layout • Preparing a modified full size layout ○ Templates • Preparing a full-size layout • Preparing a scale shop drawing

3. Describe procedures for compiling a typical cutting bill	• Part number
	• Pieces
	• Thickness of material
	• Width
	• Length
	• Description
	• Material
	• Detail
	• Cutting plan
	  ○ Stock sizes
	  ○ Saw kerf
	  ○ Factory edge allowance
	  ○ Desired grain direction
	• Templates

4. Calculate lumber quantities and costs	• Board foot

LEARNING TASKS	CONTENT
	• Standard rounding rules • Metric measure • Standard rounding rules • Linear measure • Calculating percentage of waste • Calculate lumber costs
5. Calculate quantities and costs of sheet goods	• Calculate sheet goods quantities • Calculate sheet goods costs
6. Apply layout techniques	• Shop drawing • Cutting bill • Cutting plan to specifications

Achievement Criteria

Performance — The learner will reproduce a fully dimensioned shop drawing containing orthographic and detailed views.

Conditions — The learner will be given:
- A completed drawing
- Drafting materials
- Suitable work area

Criteria — The learner will score 70% or better on a rating sheet that reflects the following criteria:
- Neatness
- Line types and weights
- Accurate scaling
- Annotated where required
- Time limit

Performance — The learner will create a cutting bill.

Conditions — The learner will be given:
- The completed drawing from the above achievement criteria

Criteria — The learner will score 70% or better on a rating sheet that reflects the following criteria:
- Accuracy
- Completeness
- Components listed in proper order
- Time limit

Performance — The learner will produce a cutting plan

Conditions — The learner will be given:
- The shop drawings and cutting bill above

Criteria	The learner will score 70% or better on a rating sheet that reflects the following criteria: • Accuracy • Completeness • Indicate trim allowances • Show the cutting sequence • Time limit
Performance	The learner will perform material usage calculations for all of the materials
Conditions	The learner will be given: • The shop drawings, cutting bill and the cutting plan above
Criteria	The learner will score 70% or better on a rating sheet that reflects the following criteria: • Accuracy • Completeness • Time limit

Line (GAC): B USE ORGANIZATIONAL SKILLS

Competency: B4 Use Quality Standards

Objectives

To be competent in this area, the individual must be able to:

- Select common woodworking joints.

LEARNING TASKS	CONTENT
1. Identify joints	• Lap joints • Dado joint • Rabbet joint • Butt joint • Edge butt joint • Mitre joint • Mortise-and-tenon joints • Dowelled joints • Scarf joint • Finger joint • Dovetail joint • Box joint • Tongue and groove joint • S joint • Lock joint • Lock-mitre joint • Biscuit joint
2. Select joints	• Application • Material • Advantages and disadvantages

Line (GAC): B USE ORGANIZATIONAL SKILLS

Competency: B6 Communicate with Others

Objectives

To be competent in this area, the individual must be able to:

- Describe methods of communication and reasons for communicating.
- Communicate with others.

LEARNING TASKS	CONTENT

1. Describe types of communication	• Listening
	  ○ Understanding
	  ○ Questioning
	  ○ Paraphrasing
	  ○ Repeating back
	• Verbal
	• Written
	  ○ Work orders
	  ○ Inspection reports
	  ○ Manufacturers' documentation
	  ○ Permits
	  ○ Timekeeping
	• Drawings and specifications
	• Trade terminology
	• Use of:
	  ○ Two-way radios
	  ○ Cell phones
	  ○ Fax machines
	  ○ Computers
	• Ethics

2. Describe communication with others	• Supervisors • Inspectors • Building occupants • General public • Other trades • Industry personnel • Apprentices mentoring • Customers
3. Describe reasons for communications	• Safety • Project coordination

LEARNING TASKS	CONTENT

	• Giving, receiving and understanding instructions
	• Clarification
	• Project notifications
	  ○ Shutdowns
	  ○ Precautions
	  ○ Customer safety

4. Apply communication skills	• Listening
	  ○ Understanding
	  ○ Questioning
	  ○ Paraphrasing
	  ○ Repeating back
	• Verbal
	• Written
	  ○ Work orders
	  ○ Timekeeping
	• Trade terminology
	• Use of:
	  ○ Cell phones
	• Ethics
	  ○ People
	  ○ Supervisors
	  ○ Building occupants
	  ○ General public
	  ○ Customers
	  ○ Other trades
	• Purpose
	  ○ Safety
	  ○ Project coordination
	  ○ Giving, receiving and understanding instructions
	  ○ Clarification
	  ○ Project notifications
	  – Shutdowns
	  – Precautions
	• Customer safety

Line (GAC): C SELECT MATERIALS

Competency: C1 Describe the Structure and Properties of Solid Wood

Objectives

To be competent in this area, the individual must be able to:

- Identify the basic structures of solid wood.
- Describe the various properties of solid wood.
- Define the differences between hardwoods and softwoods.

LEARNING TASKS	CONTENT

1. Identify the basic structures of solid wood	• Structure and growth of a tree
	  ○ Outer bark
	  ○ Inner bark
	  ○ Cambium
	  ○ Sapwood
	  ○ Heartwood
	  ○ Pith
	  ○ Rays
	  ○ Annual growth rings

2. Describe the properties of solid wood	• Advantages of solid wood • Disadvantages of solid wood • Wood and moisture • Shrinkage and expansion of wood • Specific gravity of wood

3. Explain the difference between hardwood and softwood	• Softwood and hardwood differences
	  ○ Hardwood pore patterns
	  ○ Softwood structures

Line (GAC): C SELECT MATERIALS

Competency: C2 Describe Lumber Production, Grading and Handling

Objectives

To be competent in this area, the individual must be able to:

- Derscribe lumber production techniques for hardwoods and softwoods.
- Identify natural and man-made defects in lumber.
- Define the grading of hardwoods and softwoods.
- Describe the proper handling and storage of solid lumber.

LEARNING TASKS	CONTENT
1. Describe the lumber production techniques	• Cutting methods for hardwood and softwood • Seasoning wood
2. Identify natural defects in lumber	• Decay • Knots • Shakes and splits • Reaction wood
3. Identify man-made defects in lumber	• Types of warp • Case hardening • Checks • Collapse • Honeycombing • Manufacturing imperfections • Weathering
4. Describe standard grading rules for hardwoods and softwoods	• Hardwood grading principles • Hardwood grades • Softwood grading principles • Softwood grades • Definitions and abbreviations for dressed lumber • Nominal size • Actual size
5. Describe the handling and storage of solid wood	• Temporary storage • Permanent storage • General handling procedures

Line (GAC): C SELECT MATERIALS

Competency: C3 Select Solid Wood Species

Objectives

To be competent in this area, the individual must be able to:

- Describe the characteristics of 13 solid wood species.
- Identify these species.

LEARNING TASKS	CONTENT
1. Describe and identify 13 wood species	• Douglas fir • Western white pine • White spruce • Western hemlock • Western red cedar • American white oak • Red oak • Eastern maple • Western maple • American black walnut • Brown elm • Grey elm • Yellow cedar
2. Describe the properties of solid wood	• Advantages of solid wood • Disadvantages of solid wood • Wood and moisture • Shrinkage and expansion of wood • Specific gravity of wood

3. Explain the difference between hardwood and softwood	• Softwood and hardwood differences
	  ○ Hardwood pore patterns
	  ○ Softwood structures

Achievement Criteria

Performance	The learner will identify samples of wood species.
Conditions	The learner will be given: • Unlabeled S4S samples of 13 wood species
Criteria	The learner will score 70% or better on a rating sheet that reflects the following criteria: • Correctly identify the samples • Use no reference material • 20-minute time limit

Line (GAC): C SELECT MATERIALS

Competency: C4 Select Types of Plywood

Objectives

To be competent in this area, the individual must be able to:

- Identify types and grades of hardwood and softwood plywood.
- Describe the methods used for matching face veneers.
- Apply handling and storage techniques.

LEARNING TASKS	CONTENT
1. Identify types and grades of plywood	• Softwood plywood • Hardwood plywood • Overlay plywood
2. Describe methods of matching face veneers	• Slip matching • Book matching • Random matching • Sequence matching
3. Describe the handling and storage of plywood	• Storing plywood
4. Apply storage and handling techniques	• Positioning • Moving • Humidity • Edges • Contamination • Support • Accessibility • Inventory

Line (GAC): C SELECT MATERIALS

Competency: C5 Select Types of Composition Board

Objectives

To be competent in this area, the individual must be able to:

- Describe the types, uses and manufacture of hardboard, particleboard and medium density fibreboard.
- Apply handling and storage techniques.

LEARNING TASKS	CONTENT
1. Identify types of hardboard	• Manufacture • Properties • Types and uses
2. Identify types of particle board	• Manufacture • Properties • Types and uses
3. Identify medium-density fibreboard	• Manufacture • Properties • Types and uses
4. Describe the handling and storage of composition board	• Handling • Storage
5. Apply handling and storage techniques	• Positioning • Moving • Humidity • Edges • Contamination • Support • Accessibility • Inventory

Line (GAC): C SELECT MATERIALS

Competency: C6 Select Plastic Laminates

Objectives

To be competent in this area, the individual must be able to:

- Describe the types, uses and manufacture of plastic laminates.
- Identify plastic laminate core materials.
- Apply handling and storage techniques.

LEARNING TASKS	CONTENT
1. Describe manufacture of plastic laminates	• Composition of plastic laminates • Manufacturing process • Sheet sizes
2. Identify types of plastic laminates	• General purpose (nonforming) • General purpose (postforming) • General purpose (solid colour) • Thick stock (self-supporting) • Fire-retardant grade • Commercial grade • Laboratory grade • Bending grade • Liner • Artlays and inlays

3. Select substrate materials	• Types
	  ○ Advantages
	  ○ Disadvantages
	• Preparing the core
	• Adhesive selection

4. Describe the handling and storage of plastic laminates	• Handling • Storage
5. Apply handling and storage techniques	• Positioning • Moving • Humidity • Edges • Contamination • Support • Accessibility

LEARNING TASKS	CONTENT
	• Inventory

Line (GAC): C SELECT MATERIALS

Competency: C7 Describe Specialty Materials

Objectives

To be competent in this area, the individual must be able to:

- Describe the types, usage and handling of various specialty materials.

LEARNING TASKS

1. Describe types, uses and storage of specialty materials

CONTENT

- Types
  - Cork
  - Acrylics
  - Fabrics, leathers and vinyl
  - Ceramics
  - Solid surface products
  - Stone sheet products
  - Metal products
  - Glass
  - Bending plywood
  - Lightweight core products
    - Honeycomb
    - Foam core
  - Miscellaneous materials
- Uses

Line (GAC): C SELECT MATERIALS

Competency: C8 Select Adhesives and Sealants

Objectives

To be competent in this area, the individual must be able to:

- Describe the types, usage and handling of adhesives.
- Select adhesives and sealants for different applications.

LEARNING TASKS	CONTENT
1. Describe factors that influence the selection of adhesives	• Project specifications • Storage (shelf) life • Time required for project assembly • Time required for bond and cure • Assembly area conditions • Characteristics of project components • Desired characteristics of adhesive • Cost of adhesive • Type of bond required • Hazards associated with adhesive
2. Describe adhesive classifications and uses	• Natual and synthetic adhesives • Manner of curing • Waterproof adhesives • Adhesives with high to medium moisture resistance • Adhesives with low moisture resistance
3. Describe safe handling of adhesives	• General precautions • Toxicity and safety precautions • Safe handling of epoxies • WHMIS

4. Describe the application of adhesives	• Equipment
	  ○ Mixing
	  ○ Spreading
	  ○ Curing
	• Manufacturer's recommendations for preparation and applications

5. Describe sealants and their uses	• Types of sealants

LEARNING TASKS	CONTENT

6. Describe the application of sealants	• Application
	• Safety precautions
	• Equipment
	  ○ Mixing
	  ○ Spreading
	  ○ Curing
	• Manufacturer's recommendations for preparation and application

7. Select adhesives and sealants	• Specifications
	• Environment
	  ○ Application
	  ○ End use
	• Constraints
	  ○ Time and cost

Line (GAC): C SELECT MATERIALS

Competency: C9 Select Hardware

Objectives

To be competent in this area, the individual must be able to:

- Select and use types of fasteners.

LEARNING TASKS	CONTENT
1. Describe nails	• Types • Uses • Limitations
2. Describe screws	• Types • Uses • Limitations
3. Describe bolts and nuts	• Types • Uses • Limitations
4. Describe anchors	• Types • Uses • Limitations
5. Select fasteners	• Specifications • Application • Preparation

Line (GAC): C SELECT MATERIALS

Competency: C10 Handle Materials

Objectives

To be competent in this area, the individual must be able to:

- Describe considerations when handling materials.
- Determine the proper procedure for handling materials.

LEARNING TASKS	CONTENT
1. Describe considerations when handling materials	• Safety • Storage • Timing • Transportation • LEED (Leadership in Energy and Environmental Design) • Labelling • Moving • Product protection • Disposal • Recycling
2. Determine procedures for handling materials	• Safety • Procedures • Securing • Packaging • Shipping

Line (GAC): D USE HAND TOOLS

Competency: D1 Use Basic Hand Tools

Objectives

To be competent in this area, the individual must be able to:

- Describe the use of hand tools.
- Use hand tools.
- Identify the types and uses of honing stones and files.
- Sharpen hand tools.

LEARNING TASKS	CONTENT
1. Describe the use of measuring, layout and testing tools	• Flexible steel rules • Bench rules • Folding rules • Caliper rule • Vernier calliper • Straightedge • Marking gauge • Mortising gauge • Calipers • Butt gauge • Try square, mitre square • Combination square • Framing square • Sliding T-bevel • Angle divider Wing dividers and scribers • Trammel points • Spirit level • Plumb bob • Protractor
2. Describe the use of sawing tools	• Hand crosscut saw • Hand ripsaw • Compass and keyhole saws • Coping saw • Backsaw • Dovetail saw • Miter box
3. Describe the use of planning tools	• Jointer plane

LEARNING TASKS	CONTENT
	• Fore plane • Jack plane • Smooth plane • Block plane
4. Describe the use of scraping tools	• Hand scraper • Pull scrapers • Cabinet scraper • Scraper plane • Burnisher
5. Describe the use of edge cutting tools	• Wood chisels • Mallets • Sharpening • Wood gouges
6. Describe the use of boring tools	• Common hand drills and their uses • Common boring bits and their uses • Counterskins • Combination wood drill and countersink • Dowelling jigs
7. Describe the use of fastening tools	• Tools for driving and pulling nails • “Driving” wood screws • Types of screwdrivers
8. Describe the use of metalworking tools	• Tin spins • Combination snips and aviation snips • Hacksaws • Open-end wrench • Box wrench, socket wrench • Allen wrench • Adjustable wrench • Channel-lock pliers • Electrician’s (lineman’s) pliers • Needle-nose pliers • Diagonal pliers • Wrench (vise-grip) pliers

LEARNING TASKS	CONTENT

9. Describe the use of honing stones	• Types
	  ○ Natural
	  ○ Manufactured
	• Maintenance
	• Using a honing stone

10. Describe the use of files	• Types • Maintenance
11. Use basic hand tools	• Purpose • Types and sizes • Parts • Operations • Accessories • Safety • Adjustments • Maintenance
12. Describe sharpening procedures	• Plane irons • Chisels • Scrapers
13. Maintain hand tools	• Applications

Achievement Criteria

Performance	The learner will hand-plane and cut the stock to produce two equal sized pieces.
Conditions	The learner will be given: • A full set of woodworking hand tools • A sound piece of rough softwood stock, having a damaged face area no larger than 20 mm square
Criteria	The learner will score 70% or better on a rating sheet that reflects the following criteria: • Smooth, true and square • No more than 0.5 mm variance on any dimension • Time limit
Performance	The learner will repair the above with a diamond-shaped patch of the same material.
Conditions	The learner will be given: • Required tools
Criteria	The learner will score 70% or better on a rating sheet that reflects the following criteria: • Matched visually for colour and grain

- Cut and fitted with tight joint lines
- Proportioned to blend into the undamaged area
- Sanded to a smooth flush surface
- 3 1/2 hour time limit

Performance — The learner will produce a dovetailed corner using the two pieces above.

Conditions — The learner will be given:

- The two pieces above and tools

Criteria — The learner will score 70% or better on a rating sheet that reflects the following criteria:

- Evenly-proportioned pins and tails
- Pins and tails are cut evenly and are snug-fitting
- They must project 0.5 mm past the outside of the corner
- 2 1/2 hour time limit

Performance — The learner will sharpen on of the following dulled tools:

- A block plane iron
- A jack plane iron
- A chisel

Conditions — The learner will be given:

- A tool grinder, a selection of honing stones and of the above tools

Criteria — The learner will score 70% or better on a rating sheet that reflects the following criteria:

- The cutting edge will be ground straight, square to the side and with a bevel appropriate to the tool
- No overheating of the cutting edge is permissible during the grinding
- After grinding, the cutting edge will be honed, razor sharp, to the appropriate angle, with no burrs remaining
- 15-minute time limit

Performance — The learner will sharpen a hand scraper to a cutting hook that will produce a shaving from solid hardwood with normal effort.

Conditions — The learner will be given:

- A selection of files, honing stones and a burnisher

Criteria — The learner will score 70% or better on a rating sheet that reflects the following criteria:

- The tool must be filed straight and square
- Honed to produce cutting edges
- Turned with a burnisher to produce even hooks
- 15-minute time limit

Line (GAC): E USE PORTABLE POWER TOOLS

Competency: E1 Use Power Sources

Objectives

To be competent in this area, the individual must be able to:

- Describe the components of electric and air power sources.
- Describe the basic maintenance of portable electric and air powered woodworking tools.

LEARNING TASKS	CONTENT
1. Describe electric power sources	• AC current • DC current • Breaker box • Switches • Horsepower rating • Amperage • Grounding and electrical safety procedures • Cordless power supplies
2. Describe air power sources	• Compressors • Air lines • Filter • Dryer • Lubricator • Regulator • Transformer • Air hose • Quick connectors • Safety procedures for pneumatic power • CO2
3. Describe the basic maintenance of portable power tools	• Maintenance common to electric power tools • Maintenance of specific tools • Maintenance of air-powered tools

Line (GAC): E USE PORTABLE POWER TOOLS

Competency: E2 Use Portable Power Saws

Objectives

To be competent in this area, the individual must be able to:

- Describe portable power saws.
- Use portable power saws.

LEARNING TASKS	CONTENT
1. Use portable circular saws	• Purpose • Types and sizes • Parts • Operations • Accessories • Safety • Adjustments • Maintenance • Blades • Wheels
2. Use sabre saws	• Purpose • Types and sizes • Parts • Operations • Accessories • Safety • Adjustments • Maintenance • Blades
3. Use reciprocating saws	• Purpose • Types and sizes • Parts • Operations • Accessories • Safety • Adjustments • Maintenance • Blades

LEARNING TASKS

4. Use compound mitre saws

CONTENT

- Purpose
- Types and sizes
- Parts
- Operations
- Compound angles
- Angles
- Square cut
- Accessories
- Safety
- Adjustments
- Maintenance
- Blades
- Wheels

Achievement Criteria

Performance	The learner will complete a project using at least one of the tools above.
Conditions	The learner will be given: • The saws with a selection of blades
Criteria	The learner will: • Select, install and use the correct blade • Make cuts within the tolerances on the project specifications • Time limit

Line (GAC): E USE PORTABLE POWER TOOLS

Competency: E3 Use Portable Power Drills and Screw Guns

Objectives

To be competent in this area, the individual must be able to:

- Describe portable power drills and screw guns.
- Use portable power drills and screw guns.

LEARNING TASKS	CONTENT
1. Use portable power drills	• Purpose • Types and sizes • Parts • Operations • Accessories • Safety • Adjustments • Maintenance • Bits
2. Use portable power screw guns	• Purpose • Types and sizes • Parts • Operations • Accessories • Safety • Adjustments • Maintenance • Bits

Achievement Criteria

Performance	The learner will complete a project using portable power drills and screw guns.
Conditions	The learner will be given: • A portable power drill and screw gun • Drill bits and driver
Criteria	The learner will score 70% or better on a rating sheet that reflects the following criteria: • Install the proper drill bit/driver on each procedure • Complete within the tolerances listed on the project specifications • Time limit

Line (GAC): E USE PORTABLE POWER TOOLS

Competency: E4 Use Portable Edge-Cutting Tools

Objectives

To be competent in this area, the individual must be able to:

- Describe portable power planes, routers and biscuit spliners.
- Use portable power planes, routers and biscuit spliners.

LEARNING TASKS	CONTENT
1. Use power planes	• Purpose • Types and sizes • Parts • Operations • Accessories • Safety • Adjustments • Maintenance • Blades

2. Use portable routers	• Purpose
	• Types
	  ○ Trimmer
	  ○ Plunge
	  ○ Standard
	• Parts
	• Operations
	• Accessories
	• Safety
	• Adjustments
	• Maintenance
	• Bits

3. Use portable sline cutters	• Purpose • Types and sizes • Parts • Operations • Accessories • Safety • Adjustments • Maintenance

LEARNING TASKS

CONTENT

- Blade
- Biscuits and fasteners

Achievement Criteria

Performance	The learner will complete a project using at least two of the above tools.
Conditions	The learner will be given: • Tools for the project • Cutter blades and bits
Criteria	The learner will score 70% or better on a rating sheet that reflects the following criteria: • The use of at least two tools • The proper installation of the cutter blade or bit for each procedure • Complete within the tolerances listed on the project specifications • Time limit

Line (GAC): E USE PORTABLE POWER TOOLS

Competency: E5 Use Portable Power Sanders

Objectives

To be competent in this area, the individual must be able to:

- Describe portable power sanders.
- Use portable power sanders.

LEARNING TASKS	CONTENT

1. Use portable power sanders	• Purpose
	• Types
	  ○ Belt
	  ○ Orbital
	  ○ Oscillating
	  ○ Detail
	• Parts
	• Operations
	• Accessories
	• Safety
	• Adjustements
	• Maintenance
	• Belts
	• Abrasives

Achievement Criteria

Performance	The learner will use portable power sanders to complete a project.
Conditions	The learner will be given: • Sanders • Belts/disks
Criteria	The learner will score 70% or better on a rating sheet that reflects the following criteria: • Installation of proper sanding belt/disk for each task • Complete within the tolerances listed on the project specifications • Time limit

Line (GAC): E USE PORTABLE POWER TOOLS

Competency: E6 Use Portable Power Fastening Tools

Objectives

To be competent in this area, the individual must be able to:

- Describe portable power fastening tools.
- Use portable power fastening tools.

LEARNING TASKS	CONTENT
1. Use staplers	• Purpose • Types and sizes • Parts • Operations • Accessories • Safety • Adjustments • Maintenance • Fasteners
2. Use nailers and pin guns	• Purpose • Types and sizes • Parts • Operations • Accessories • Safety • Adjustments • Maintenance • Fasteners

Achievement Criteria

Performance	The learner will use portable power fastening tools to complete a project.
Conditions	The learner will be given: • Portable power fastening tools • Staples, nails or pins
Criteria	The learner will score 70% or better on a rating sheet that reflects the following criteria: • Select and install the proper staple/nail of pin for the project • Complete within the tolerances listed on the project specifications • Time limit

Line (GAC): F USE WOODWORKING MACHINES

Competency: F1 Use Breakout Procedures

Objectives

To be competent in this area, the individual must be able to:

- Describe the use of rip, crosscut and combination saw blades.
- Define standard lumber sizes.
- Use breakout procedures.
- Detail machine

LEARNING TASKS	CONTENT

1. Describe saw blades	• Types
	  ○ Rip
	  ○ Cross cut
	  ○ Combination
	  ○ Specialty
	• Characteristics
	• Uses
	• Safety
	• Handling
	• Maintenance

2. Describe solid wood breakout	• Standard dressing allowances
	• Procedure for solid wood breakout
	• Breaking out wide and laminated material
	  ○ Grain orientation
	  ○ Adhesive selection
	  ○ Clamping procedure

3. Describe sheet goods breakout	• Breaking out plywood • Breaking out composition board • Breaking out plastic laminate • Breaking out acrylic sheets
4. Describe detail machining	• Check layout • Check cutting bill • Plan sequence of machine operations • Utilization of material • Cutting square • Accuracy

LEARNING TASKS	CONTENT

5. Breakout material	• Check material thickness variations
	• Use breakout procedures
	  ○ Single pieces
	  ○ Laminated pieces

6. Detail machine material	• Use detail machining procedures

Achievement Criteria

Performance — The learner will use breakout and detail machining procedures to complete a project.

Conditions — The learner will be given:

- One or more of the following machines:
- Radial arm saw
- Table saw
- Jointer
- Thickness planer
- Band/scroll saws
- Drilling/boring machines
- Sanding machines
  - Wide belt
  - Stroke
  - Hoizontal/Vertical belt
  - Disk
  - Spindle
- Edge-banding machines
- Materials

Criteria — The learner will score 70% or better on a rating sheet that reflects the following criteria:

- Complete within the tolerances listed on the project specifications
- Time limit

Line (GAC): F USE WOODWORKING MACHINES

Competency: F2 Use the Radial-Arm Saw

Objectives

To be competent in this area, the individual must be able to:

- Describe the radial-arm saw.
- Use the radial-arm saw.

LEARNING TASKS	CONTENT
1. Describe the radial-arm saw	• Purpose • Types and sizes • Parts • Operations • Accessories • Safety • Adjustments • Troubleshooting • Maintenance • Blades
2. Use the radial-arm saw	• Applications

Achievement Criteria

Performance	The learner will complete a project using the radial-arm saw.
Conditions	The learner will be given: • A radial-arm saw and blades • Materials
Criteria	The learner will score 70% or better on a rating sheet that reflects the following criteria: • Complete within the tolerances listed on the project specifications • Time limit

Line (GAC): F USE WOODWORKING MACHINES

Competency: F3 Use the Table Saw

Objectives

To be competent in this area, the individual must be able to:

- Describe the table saw.
- Use the table saw.

LEARNING TASKS	CONTENT
1. Describe the table saw	• Purpose • Types and sizes • Parts • Operations • Accessories • Safety • Adjustments • Troubleshooting • Maintenance • Blades
2. Use the table saw	• Applications

Achievement Criteria

Performance	The learner will complete a project using the table saw.
Conditions	The learner will be given: • A table saw • Materials
Criteria	The learner will score 70% or better on a rating sheet that reflects the following criteria: • Complete within the tolerances listed on the project specifications • Time limit

Line (GAC): F USE WOODWORKING MACHINES

Competency: F4 Use the Jointer

Objectives

To be competent in this area, the individual must be able to:

- Describe the jointer.
- Use the jointer.

LEARNING TASKS	CONTENT
1. Describe the jointer	• Purpose • Types and sizes • Parts • Operations • Accessories • Safety • Adjustments • Troubleshooting • Maintenance • Knives
2. Use the jointer	• Applications

Achievement Criteria

Performance	The learner will complete a project using the jointer.
Conditions	The learner will be given: • Jointer • Materials
Criteria	The learner will score 70% or better on a rating sheet that reflects the following criteria: • Complete within the tolerances listed on the project specifications • Time limit

Line (GAC): F USE WOODWORKING MACHINES

Competency: F5 Use the Thickness Planer

Objectives

To be competent in this area, the individual must be able to:

- Describe the thickness planer.
- Use the thickness planer.

LEARNING TASKS	CONTENT
1. Describe the thickness planer	• Purpose • Types and sizes • Parts • Operations • Accessories • Safety • Adjustments • Troubleshooting • Maintenance • Knives
2. Use the thickness planer	• Applications

Achievement Criteria

Performance	The learner will complete a project using the thickness planer.
Conditions	The learner will be given: • Thickness planer • Materials
Criteria	The learner will score 70% or better on a rating sheet that reflects the following criteria: • Complete within the tolerances listed on the project specifications • Time limit

Line (GAC): F USE WOODWORKING MACHINES

Competency: F7 Use Band and Scroll Saws

Objectives

To be competent in this area, the individual must be able to:

- Describe band and scroll saws.
- Use band and scroll saws.

LEARNING TASKS	CONTENT
1. Describe band and scroll saws	• Purpose • Types and sizes • Parts • Operations • Accessories • Safety • Adjustments • Troubleshooting • Maintenance • Blades
2. Use the band saw	• Applications
3. Use the scroll saw	• Applications

Achievement Criteria

Performance	The learner will complete a project using a band saw and/or scroll saw.
Conditions	The learner will be given: • Saws • Blades
Criteria	The learner will score 70% or better on a rating sheet that reflects the following criteria: • Complete within the tolerances listed on the project specifications • Time limit

Line (GAC): F USE WOODWORKING MACHINES

Competency: F8 Use Drilling and Boring Machines

Objectives

To be competent in this area, the individual must be able to:

- Describe the drill press.
- Use the drill press.

LEARNING TASKS	CONTENT
1. Describe the drill press	• Purpose • Types ○ Drill press • Parts • Operations • Accessories • Safety • Adjustments • Troubleshooting • Maintenance • Bits
2. Use the drill press	• Applications

Achievement Criteria

Performance	The learner will complete a project using the drill press.
Conditions	The learner will be given: • Drill press • Materials
Criteria	The learner will score 70% or better on a rating sheet that reflects the following criteria: • Complete within the tolerances listed on the project specifications • Time limit

Line (GAC): F USE WOODWORKING MACHINES

Competency: F10 Use Routing Machines

Objectives

To be competent in this area, the individual must be able to:

- Describe the manual dovetailing machine.
- Use manual dovetailing machines.

LEARNING TASKS	CONTENT
1. Describe the manual dovetail machine	• Purpose • Parts • Operations • Accessories • Safety • Adjustments • Troubleshooting • Maintenance • Bits
2. Use manual dovetailing machines	• Applications

Achievement Criteria

Performance	The learner will accurately machine a project to a template.
Conditions	The learner will be given: • Appropriate project information • Materials • Manual dovetailing machine

Criteria	The learner will score 70% or better on a rating sheet that reflects the following criteria:
	• The finished piece will be:
	  ○ Cleanly cut
	  ○ Free of chip-out and burn marks
	  ○ True to the template
	• 30-minute time limit

Performance	The learner will machine and dry assemble one drawer box to specified dimensions.
Conditions	The learner will be given: • Sound, solid hardwood stock • A dovetailing machine

Criteria	The learner will score 70% or better on a rating sheet that reflects the following criteria:
	• The finished drawer box will be::
	  ○ Within 0.5mm on width and length dimensions
	  ○ Cleanly cut without chip out
	  ○ Top edges flush
	  ○ 5 mm projection of the pin portion of the joint on all four corners
	• 30-minute time limit

Line (GAC): F USE WOODWORKING MACHINES

Competency: F11 Use Sanding Machines

Objectives

To be competent in this area, the individual must be able to:

- Describe sanding machines.
- Use sanding machines.

LEARNING TASKS	CONTENT

1. Describe sanding machines	• Purpose
	• Types
	  ○ Disc
	  ○ Belt
	  – Horizontal
	  – Vertical
	  ○ Wide belt (basic)
	  ○ Stroke
	  ○ Spindle
	• Parts
	• Operations
	• Accessories
	• Safety
	• Adjustments
	• Troubleshooting
	• Maintenance

2. Use sanders	• Applications

Achievement Criteria

Performance	The learner will complete a project using sanding machines.
Conditions	The learner will be given: • Sanding machines • Materials • Project information
Criteria	The learner will score 70% or better on a rating sheet that reflects the following criteria: • Complete within the tolerances listed on the project specifications • Time limit

Line (GAC): F USE WOODWORKING MACHINES

Competency: F13 Use Edge-Banding Machines

Objectives

To be competent in this area, the individual must be able to:

- Describe basic edge-banding machines.
- Use basic edge-banding machines.

LEARNING TASKS	CONTENT
1. Describe basic edge-banding machines	• Purpose • Types • Parts • Operations • Accessories • Safety • Adjustments • Troubleshooting • Maintenance
2. Use basic edge-banding machines	• Applications

Line (GAC): F USE WOODWORKING MACHINES

Competency: F14 Use the Lathe

Objectives

To be competent in this area, the individual must be able to:

- Describe the lathe.
- Use the lathe.

LEARNING TASKS	CONTENT
1. Describe the lathe	• Purpose • Types • Parts • Operations • Indexing • Accessories • Safety • Adjustments • Troubleshooting • Maintenance • Cutting and scraping tools
2. Use the lathe	• Applications

Achievement Criteria

Performance The learner will perform one of the following operations:

- Produce a carving mallet to project specifications using spindle turning methods
- Produce a small bowl to project specifications using face-plate turning methods

Conditions The learner will be given:

- A lathe
- A set of wood-turning tools
- A sound piece of hardwood stock

Criteria The learner will score 70% or better on a rating sheet that reflects the following criteria:

- Use correct spindle turning methods, or correct face-plate turning methods depending on the project
- Complete within the tolerances listed on the project specifications
- Time limit

Line (GAC): H ASSEMBLE PRODUCTS

Competency: H1 Use Hand-Operated Clamps

Objectives

To be competent in this area, the individual must be able to:

- Describe hand-operated clamps.
- Use hand-operated clamps.

LEARNING TASKS	CONTENT

1. Describe hand-operated clamps	• Purpose
	• Types
	  ○ Bar clamp
	  ○ Pipe clamp
	  ○ Spring clamp
	  ○ Hand screw
	  ○ C-clamp
	  ○ Band clamp
	  ○ Mitre clamp
	  ○ Quick-acting clamps
	  ○ F-clamp
	• Parts
	• Operations
	• Accessories
	• Safety
	• Adjustments
	• Maintenance
	• Storage

2. Use hand-operated clamps	• Applications

Achievement Criteria

Performance	The learner will complete a project using hand-operated clamps.
Conditions	The learner will be given: • Project information • Clamps • Materials
Criteria	The learner will score 70% or better on a rating sheet that reflects the following criteria: • Complete within the tolerances listed on the project specifications • Time limit

Line (GAC): H ASSEMBLE PRODUCTS

Competency: H3 Use Assembly Techniques

Objectives

To be competent in this area, the individual must be able to:

- Identify the procedures for assembling cabinet carcasses and components.
- Describe the application and trimming of plastic laminate.
- Use assembly techniques to specifications.

LEARNING TASKS	CONTENT
1. Prepare for assembly	• Assembly platform • Strongbacks • Convex bearers • Fasteners • Clamps • Sighting boards • Squaring rod • Drawing and cut list • Adhesive selection • Hardware • Pre-finishing

2. Describe assembly procedures	• Check material
	  ○ Size
	  ○ Type
	• Detail machining
	• Dry assembly
	  ○ Check sequence
	  ○ Organize parts
	• Assemble the sub-assemblies
	  ○ Hardware
	• Assemble the carcass
	  ○ Apply adhesive
	  ○ Clamp/fasten
	  ○ Check for square/twist
	  ○ Clean
	  ○ Label

3. Describe procedures for applying plastic laminate	• Checks before applicaion
	  ○ Temperature
	  ○ Humidity

LEARNING TASKS	CONTENT
4. Use assembly techniques	○ Cleanliness ○ Grain/pattern direction ○ Time constraint ○ Equipment check ○ Sequence • Adhesive application • Apply to core ○ Position ○ Pressure application • Trimming/filing ○ Radius inside corners • Applications

Achievement Criteria

Performance	The learner will complete a project using assembly techniques.
Conditions	The learner will be given: • Tools • Materials • Project information
Criteria	The learner will score 70% or better on a rating sheet that reflects the following criteria: • Complete within the tolerances listed on the project specifications • Time limit

Line (GAC): H ASSEMBLE PRODUCTS

Competency: H4 Prepare Products for Shipping

Objectives

To be competent in this area, the individual must be able to:

- Describe procedures for labelling and protecting millwork items.
- Describe documentation relative to the millwork trade.

LEARNING TASKS	CONTENT
1. Describe millwork labelling procedures	• Cabinets • Specialty items • Panels • Running trim • Doors and frames
2. Describe procedures for protecting millwork	• Cabinets • Specialty items • Panels • Running trim • Doors and frames
3. Describe millwork documents	• Work order • Installation information • Purchase order • Delivery slip • Bill of lading • Invoice

Line (GAC): J APPLY A FINISH

Competency: J1 Prepare Wood Surfaces for Finishing

Objectives

To be competent in this area, the individual must be able to:

- Describe the types and properties of coated abrasives.
- Describe the procedures for machine and hand sanding.
- Perform pre-finishing repairs and prepare wood surfaces.

LEARNING TASKS	CONTENT
1. Describe coated abrasives	• Types of abrasives • Grit sizes • Coatings • Backings • Sheet sizes • Adhesives
2. Describe sanding aids and techniques	• Using a sanding block • Handsanding procedures • Machine sanding procedures
3. Describe pre-finishing repairs and final sanding	• Removing glue • Raising shallow dents • Filling cracks and holes • Plastic wood and wood dough • Final sanding
4. Prepare wood surfaces to receive a finish	• Applications

Achievement Criteria

Performance	The learner will complete a project by preparing wood surfaces for finishing.
Conditions	The learner will be given: • Tools • Equipment • Project information
Criteria	The learner will score 70% or better on a rating sheet that reflects the following criteria: • Complete within the tolerances listed on the project specifications • Time limit

Level 2

Cabinetmaker (Joiner)

Line (GAC): B USE ORGANIZATIONAL SKILLS

Competency: B2 Apply Layout Techniques

Objectives

To be competent in this area, the individual must be able to:

- Produce sketches and shop drawings.
- Define standard millwork sizes.
- Produce a cutting bill, cutting plan and perform quantity and cost calculations for material.
- Perform basic geometric constructions.

LEARNING TASKS	CONTENT
1. Review Year One	• Types and uses of shop drawings • Producing shop drawings • Compiling a typical cutting bill • Producing a cutting plan • Calculate material quantities and costs
2. Describe standard millwork sizes	• Kitchen cabinets • Bookshelves (open) • Tables • Chairs • Office desks • Computer stations • Vanities • Requirements for persons with disabilities
3. Describe procedures for producing shop sketches	• Critical information • Methods • Views and details
4. Describe procedures for basic geometric layouts	• Angle geometry functions • Circle geometry functions
5. Apply layout techniques	• Prepare a shop sketch • Perform geometric layout exercises • Perpare a scaled shop drawing and cutting bill • Check site dimensions

Achievement Criteria

Performance	The learner will produce a working shop sketch.
Conditions	The learner will be given: • Drawing specifications • Drafting materials • Suitable work area
Criteria	The learner will score 70% or better on a rating sheet that reflects the following criteria: • Completeness • Accuracy • Clarity • Neatness • Time limit

Achievement Criteria

Performance	The learner will produce a fully-dimensioned shop drawing containing orthographic, pictoral and detailed views.
Conditions	The learner will be given: • The sketch above • Drafting materials • A suitable work area
Criteria	The learner will score 70% or better on a rating sheet that reflects the following criteria: • Neatly drafted • Correct line types and weights • Scaled accurately • Annotated • Time limit

Achievement Criteria

Performance	The learner will produce a cutting bill.
Conditions	The learner will be given: • The drawing above
Criteria	The learner will score 70% or better on a rating sheet that reflects the following criteria: • Complete information for all project components • Listed in specified order • Time limit

Achievement Criteria

Performance	The learner will produce a cutting plan.
Conditions	The learner will be given: • The drawing and cutting bill above
Criteria	The learner will score 70% or better on a rating sheet that reflects the following criteria:

- Accuracy
- All required items included
- Time allowances included
- Cutting sequence shown
- Optimization
- Time limit

Achievement Criteria

Performance	The learner will perform material usage calculations.
Conditions	The learner will be given: • The completed drawing, the cutting bill and the cutting plan
Criteria	The learner will score 70% or better on a rating sheet that reflects the following criteria: • Includes all material • Time limit

Line (GAC): B USE ORGANIZATIONAL SKILLS

Competency: B4 Use Quality Standards

Objectives

To be competent in this area, the individual must be able to:

- Identify the parts of a cabinet.
- Describe the types and grades of cabinets.
- Define the Quality Standards Illustrated (QSI) quality standards for materials, doors and installation.

LEARNING TASKS	CONTENT
1. Interpret cabinet part terminology	• Case • Base • Cabinet faces
2. Describe QSI Lumber and Panel products quality grades	• Moisture content • Exterior softwoods • Interior softwoods • Hardwoods • Lumber sizes • Softwood plywood • Hardwood plywood • Birch plywood • Refer to: QSI Manual, Sections 100, 200

3. Describe QSI cabinet grades and types	• Parts of casework
	  ○ Exposed
	  ○ Semi-exposed
	  ○ Concealed
	• Casework types
	• Hardware
	• Grades
	  ○ Custom
	  ○ Premium
	• Refer to: QSI Manual, Section 400

4. Describe QSI door grades and types	• Types
	  ○ Flush
	  ○ Bifold
	  ○ Specialty
	  ○ Stile-and-rail

LEARNING TASKS	CONTENT
	• Grades • Custom • Premium • Refer to: QSI Manual Sections 1300, 1400

5. Describe QSI installation specifications	• Product delivery, storage and handling
	• Job conditions
	• Installation
	  ○ Cabinet and casework
	  ○ Panelling and trim
	  ○ Interior frames
	  ○ Exterior frames
	  ○ Wood doors
	  ○ Finish hardware
	• Sanding
	• Fastening devices and methods
	• Effects of humidity and temperature on wood
	• Refer to: QSI manual, Section 1700

6. Locate information in the QSI manual	• Read the QSI manual and extract information to specifications

Achievement Criteria

Performance: The learner will produce a working shop sketch.

Conditions: The learner will be given:

- Drawing specifications
- Drafting materials
- Suitable work area

Criteria: The learner will score 70% or better on a rating sheet that reflects the following criteria:

- Completeness
- Accuracy
- Clarity
- Neatness

Line (GAC): B USE ORGANIZATIONAL SKILLS

Competency: B5 Read Blueprints and Specifications

Objectives

To be competent in this area, the individual must be able to:

- Describe parts of blueprint.
- Describe the views, symbols and abbreviations used on blueprints.
- Interpret door and window schedules.
- Read residential blueprints.

LEARNING TASKS	CONTENT
1. Describe a blueprint	• Drawing paper sizes • Parts of a blueprint • Symbols, abbreviations and notations • Interior design drawings
2. Describe the title block	• Name and location of project • Name of person or agency responsible for the drawing • Title of drawing • Sheet number • Drawing scale • Preparation information • Job (or project) number • Revisions • General notes
3. Describe plan types	• Block plan • Site plan • Foundation plan • Floor plans • Reflected ceiling plan
4. Describe additional views and schedules	• Elevations • Sectional views • Detail drawings • Door and window schedules • Room finish schedule • Abbreviations

5. Identify symbols and abbreviations	• Door and window references
	  ○ Plan
	  – Handing

LEARNING TASKS	CONTENT
	○ Elevations • Symbols ○ Appliance ○ Electrical ○ Telephone ○ Plumbing ○ Heating, ventilating, air conditioning
6. Read residential blueprints	• Read and interpret residential blueprints and schedules to specifications

Line (GAC): B USE ORGANIZATIONAL SKILLS

Competency: B7 Apply Computer Skills

Objectives

To be competent in this area, the individual must be able to:

- Describe the basic computer hardware components.
- Identify computer operating systems.
- Use basic computer commands.
- Create drawings using CAD software.

LEARNING TASKS	CONTENT
1. Describe basic computer hardware components	• C.P.U. • Hard disk • Monitor • Keyboard • Mouse • Surge protection • Networks Storage media
2. Describe basic computer operating systems	• Windows Mac
3. Use basic computer commands	• Using the mouse • Using the keyboard • File management Accessing programs
4. Describe CAD programs and initial drawing set-up	• Usage and capabilities • Initial drawing set-up ○ Layer control • Basic icons and pull-down menus • Commands ○ New drawing ○ Drawing limits ○ Layers and line types ○ Drawing units ○ Snap and grid
5. Describe basic CAD commands	• Drawing • Editing Layer control
6. Use CAD software	• Applications

Achievement Criteria

Performance — The learner will perform the following computer exercises:

- Computer start-up and shut down procedures
- Navigate the screen using a mouse and the keyboard
- Create, copy, rename and remove files and folders
- Access various programs using the mouse and/or keyboard

Conditions — The learner will be given:

- A recent model computer
- A current operating system

Criteria — The learner will score 70% or better on a rating sheet that reflects the following criteria:

- Complete the exercises without error
- 30-minute time limit

Achievement Criteria

Performance — The learner will complete a drawing using CAD drawing and editing functions.

Conditions — The learner will be given:

- Project information
- A recent model computer
- Current CAD software

Criteria — The learner will score 70% or better on a rating sheet that reflects the following criteria:

- Create and name a new drawing file
- Set drawing limits, layers and line types
- Set drawing units, snap and grid
- Include the following:
  - A title block
  - Border
  - Three orthographic views (top, front and left hand)
  - At least one scaled detail view
- Save the drawing to diskette
- Complete the project accurately
- 60-minute time limit

Line (GAC): C SELECT MATERIALS

Competency: C3 Select Solid Wood Species

Objectives

To be competent in this area, the individual must be able to:

- Describe the characteristics of 26 solid wood species.
- Identify 26 solid wood species.

LEARNING TASKS	CONTENT
1. Review Level One	• 13 species
2. Identify an additional 13 wood species	• Sitka spruce • Aromatic cedar • Western larch • Eastern birch • Western birch • Teak • Padauk • American ash • Red alder • Phillippine mahogany • Honduras mahogany • American cherry • Butternut

Achievement Criteria

Performance	The learner will identify wood samples.
Conditions	The learner will be given: • Unlabeled S4S samples of the 26 listed wood species (including the 13 from Level One) • No reference materials
Criteria	The learner will score 70% or better on a rating sheet that reflects the following criteria: • Wood species are placed randomly on a table • 30-minute time limit

Line (GAC): C SELECT MATERIALS

Competency: C9 Select Hardware

Objectives

To be competent in this area, the individual must be able to:

- Select cabinet hardware.

LEARNING TASKS	CONTENT
1. Describe door hardware	• Cabinet door hinges • Door catches • Sliding door hardware
2. Describe hardware for drawers	• Centre guide • Metal slides
3. Describe adjustable shelf hardware	• Shelf supporting pins • Wire hangers • Shelf standards
4. Describe cabinet locks	• Cylinder locks for drawers and hinged doors • Cylinder locks for sliding wood doors Surface-mounted locks for sliding glass doors • Gang (multiple-drawer) lock
5. Describe pulls, handles and knots	Number and position of pulls, handles and knobs • Pulls • Handles • Knobs
6. Describe specialty hardware	• Knock-down (KD) fittings • Lazy Susan • Wire components • Adjustable levellers • Pivot sliding door fitting • TV shelf slide • Flap (drop leaf) stay
7. Select cabinet hardware	• Applications

Line (GAC): D USE HAND TOOLS

Competency: D1 Use Basic Hand Tools

Objectives

To be competent in this area, the individual must be able to:

- Describe the use of honing stones for maintaining cutting edges.
- Interpret grinding wheel codes.
- Use and maintain grinding machines.

LEARNING TASKS	CONTENT
1. Review Level One	• Honing stones

2. Describe the use of grinding machines	• Grinding wheels
	  ○ Types
	  ○ Grit sizes
	  ○ Grades (hardness)
	  ○ Structure
	  ○ Types of bond
	  ○ Labelling
	  ○ Speed
	• Calculating cutting speeds for a system with a multi-step pulley
	• Wheel dressers
	  ○ Types

3. Describe procedures for the maintenance of grinding wheels	• Inspecting • Testing • Dressing • Truing
4. Describe setting up a grinder	• Inspection • Tests • Safety procedures for grinders
5. Use grinding machines	• Procedures • Hand tool maintenance

Line (GAC): F USE WOODWORKING MACHINES

Competency: F6 Use the Panel Saw

Objectives

To be competent in this area, the individual must be able to:

- Describe the panel saw.
- Use the panel saw.

LEARNING TASKS	CONTENT

1. Describe the panel saw	• Purpose
	• Types
	  ○ Horizontal
	  ○ Vertical
	• Parts
	• Operations
	• Accessories
	• Safety
	• Adjustments
	• Troubleshooting
	• Maintenance
	• Blades
	  ○ Scoring
	  ○ Main

2. Use the panel saw	• Applications

Achievement Criteria

Performance	The learner will cut pieces to specified criteria.
Conditions	The learner will be given: • Project information • Materials • A panel saw
Criteria	The learner will score 70% or better on a rating sheet that reflects the following criteria: • Saw blade type and speed must be selected and installed correctly • Where required, the scoring blade must be installed and correctly set • All pieces must be cut cleanly, within 0.5 mm on length and width dimensions • Angle and mitre cust must be within 0.5 degrees • Time limit

Line (GAC): F USE WOODWORKING MACHINES

Competency: F8 Use Drilling and Boring Machines

Objectives

To be competent in this area, the individual must be able to:

- Describe boring machines.
- Use boring machines.

LEARNING TASKS	CONTENT

1. Describe boring machines	• Purpose
	• Types
	  ○ Specialty
	  – Hardware
	  ○ Vertical
	  ○ Horizontal
	• Parts
	• Operations
	• Accessories
	• Safety
	• Adjustments
	• Troubleshooting
	• Maintenance
	• Bits

2. Use boring machines	• Applications

Achievement Criteria

Performance The learner will machine and dry assemble:

- One stile and rail dowelled frame
- One dowelled frame with mitred corners

Conditions The learner will be given:

- Project information
- Suitable materials
- A single or double-spindle horizontal boring machine

Criteria The learner will score 70% or better on a rating sheet that reflects the following criteria:

- Both frames will be machined with:
  - Joints
  - Snug faces
  - Flush edges
- A minimum of two dowels per joint will be used
- 30-minute time limit to complete each frame

Line (GAC): F USE WOODWORKING MACHINES

Competency: F9 Use Mortising and Tenoning Machines

Objectives

To be competent in this area, the individual must be able to:

- Describe the mortising and single-end tenoning machines.
- Use the mortising and single-end tenoning machines.

LEARNING TASKS	CONTENT

1. Describe mortising machines	• Purpose
	• Types
	  ○ Hollow chisel and bit
	  ○ Chain
	  ○ Router
	• Parts
	• Operations
	• Accessories
	• Safety
	• Adjustments
	• Troubleshooting
	• Maintenance

2. Describe the single-end tenoning machines	• Purpose
	• Types
	  ○ Sliding table
	  ○ Fixed table
	• Parts
	• Operations
	• Accessories
	• Safety
	• Adjustments
	• Troubleshooting
	• Maintenance
	• Cutter heads

3. Use mortising machines	• Applications
4. Use single-end tenoning machines	• Applications

Achievement Criteria

Performance	The learner will machine and dry assemble a coped and rabbeted sash.
Conditions	The learner will be given: • Project information • Sash materials • A mortise and single-end tenoner

Criteria	The learner will score 70% or better on a rating sheet that reflects the following criteria:
	• Machine the frame using a slotted mortise and tenon joint
	• Snug enough so that the frame will stay together when dry assembled
	• Held up by one stile
	• The frame must not require excessive force (mallet) when assembling
	• When dry-clamped, the frame must be:
	  ○ Square
	  ○ Twist free
	  ○ Vary no more than 0.5 mm on width or height dimension
	• The tenons must have 1.5 mm of clearance at the bottom of each mortise
	• Each corner must be flush on the face:
	  ○ No deflection of stiles of rails when the joint is clamped tight
	  ○ No visible gaps at the joint lines
	• Complete the project accurately
	• 1-hour time limit

Line (GAC): F USE WOODWORKING MACHINES

Competency: F10 Use Routing Machines

Objectives

To be competent in this area, the individual must be able to:

- Describe the automatic dovetailing machine.
- Use automatic dovetailing machines.

LEARNING TASKS	CONTENT
1. Describe the automatic dovetail machine	• Purpose • Parts • Operations • Accessories • Safety • Adjustments • Troubleshooting • Maintenance • Bits
2. Use automatic dovetailing machines	• Applications

Achievement Criteria

Performance	The learner will machine and dry assemble one drawer box to specified dimensions.
Conditions	The learner will be given: • Project information • Sound solid hardwood stock • An automatic dovetailing machine
Criteria	The learner will score 70% or better on a rating sheet that reflects the following criteria: • The finished drawer box will be: • Within 0.5mm on width and length dimensions • Cleanly cut without chip out • Flush top edges • 0.5 mm projection of the pin portion of the joint on all four corners • 30-minute time limit

Line (GAC): F USE WOODWORKING MACHINES

Competency: F13 Use Edge-Banding Machines

Objectives

To be competent in this area, the individual must be able to:

- Describe semi-automatic and automatic edge-banders.
- Use semi-automatic and automatic edge-banders.

LEARNING TASKS	CONTENT

1. Describe semi-automatic and automatic edge-banding machines	• Purpose
	• Types
	  ○ Pre-glued
	  ○ Hot melt
	  ○ Line cure
	• Feed methods
	  ○ Manual
	  ○ Automatic
	• Parts
	• Operations
	• Accessories
	• Safety
	• Adjustments
	• Troubleshooting
	• Maintenance
	• Glue types

2. Use semi-automatic and automatic edge-banding machines	• Applications

Achievement Criteria

Performance The learner will set up a semi-automatic edge-bander and apply four edges to the core.

Conditions The learner will be given:

- Project information
- An automatic edge-bander
- Core material
- Pre-glued roll type edging

Criteria The learner will score 70% or better on a rating sheet that reflects the following criteria:

- Apply four edges to the core
  - Tightly
  - No visible gaps
  - Ready for final clean-up
- 20-minute time limit

Achievement Criteria

Performance	The learner will set up a semi-automatic edge-bander ready for a production run.
Conditions	The learner will be given: • Project information • A semi-automatic edge-bander • Core material • 3 mm roll type PVC edging

Criteria	The learner will score 70% or better on a rating sheet that reflects the following criteria:
	• Set up will include:
	  ○ Panel thickness
	  ○ Feed speed
	  ○ Front and rear end trim
	  ○ Top and bottom rough trim
	  ○ Top and bottom fine trim
	  ○ With radius, scrapers, buffers and reheat unit
	• 30-minute time limit

Line (GAC): H ASSEMBLE PRODUCTS

Competency: H3 Use Assembly Techniques

Objectives

To be competent in this area, the individual must be able to:

- Apply and trim plastic laminate to curved products.

LEARNING TASKS	CONTENT
1. Review Level 1	• Assembly preparation • Assembly procedures • Procedures for applying plastic laminate

2. Describe the application and trimming of plastic laminate to curved products	• Laminate joints
	  ○ Curved surface
	  – Methods
	  ○ Flat surface
	  – Methods

3. Apply and trim plastic laminate	• Applications

Achievement Criteria

Performance

The learner will cut and apply a plastic laminate edge to the core as follows:

- Having one joint
- Flush
- No visible gaps
- Tightly glued without distortion or bubbling
- Trim and file the edge

After completing the above, the learner will cut and apply a plastic laminate face to the core as follows:

- Having one joint
- Centred on the top
- In line with the edge joint
- Face tightly glued to the core
- No visible gaps on any joint
- Flush on the top surface

Conditions

The learner will be given:

- A previously cut circular core less than 400mm in diameter
- G.P. plastic laminate
- Cutting and routing tools
- Glue and files

Criteria

The learner will score 70% or better on a rating sheet that reflects the following criteria:

- Trim the excess plastic laminate without damaging or cutting into any exposed surface

- Evenly file all exposed edges of the completed top
- No burn or file marks
- Lightly easing on any sharp edges
- 2-hour time limit

Line (GAC): I CONSTRUCT SPECIALTY ITEMS

Competency: I1 Construct Sashes, Doors and Frames

Objectives

To be competent in this area, the individual must be able to:

- Describe windows, doors and frames.
- Construct a sash.

LEARNING TASKS	CONTENT

1. Describe a window	• Terminology
	  ○ Sash parts
	  ○ Frame parts
	  ○ Glazing
	• Types
	  ○ Interior
	  ○ Exterior
	• Construction
	  ○ Layout
	  – Hardware options
	  ○ Machining
	  ○ Assembly
	• Standard sizes

2. Describe a door and a frame	• Terminology
	  ○ Door parts
	  ○ Frame parts
	• Types
	  ○ Door
	  – Flush panel
	  – Stile and rail
	  ○ Frame
	  – Interior
	  – Exterior
	• Construction
	  ○ Layout
	  – Hardware options
	  ○ Machining
	  ○ Assembly
	• Standard sizes

3. Construct a sash	• Applications

Level 3

Cabinetmaker (Joiner)

Line (GAC): B USE ORGANIZATIONAL SKILLS

Competency: B2 Apply Layout Techniques

Objectives

To be competent in this area, the individual must be able to:

- Produce a shop sketch, shop drawing and cutting bill for a curved product.
- Perform advanced geometric constructions.

LEARNING TASKS	CONTENT
1. Review Year One	• Types and uses of shop drawings • Producing shop drawings • Compiling a typical cutting bill • Producing a cutting plan • Calculate material quantities and costs
2. Review Year Two	• Standard millwork sizes • Procedures for producing shop sketches • Basic geometric functions
3. Describe procedures for advanced geometric layouts	• Elipse • Polygons
4. Apply layout techniques	• Perform advanced geometric layout exercises • Produce a working sketch for a curved product • Prepare a full-sized layout for a curved product • Check site dimensions • Cutting bill

Achievement Criteria

Performance	The learner will produce a working shop sketch.
Conditions	The learner will be given: • A set of drawing specifications • Drafting materials • A suitable work area
Criteria	The learner will score 70% or better on a rating sheet that reflects the following criteria: • Accuracy • 30-minute time limit

Achievement Criteria

Performance The learner will produce a fully-dimensioned shop drawing.

Conditions The learner will be given:

- The sketch above
- Drafting materials
- A suitable work area

Criteria The learner will score 70% or better on a rating sheet that reflects the following criteria:

- The drawing will contain orthographic, pictorial and detail views
- Neatly drafted
- Correct line types and weights
- Scaled accurately
- Annotated where required
- 8-hour time limit

Achievement Criteria

Performance The learner will prepare an accurate cutting bill.

Conditions The learner will be given:

- The completed drawing above
- All necessary materials
- A suitable work space

Criteria The learner will score 70% or better on a rating sheet that reflects the following criteria:

- The cutting bill will contain complete information for all the project components
- Components will be listed in proper order
- Accuracy
- 1-hour time limit

Achievement Criteria

Performance The learner will produce an accurate cutting plan.

Conditions The learner will be given:

- The completed drawing and cutting bill above
- All necessary materials
- A suitable work area

Criteria The learner will score 70% or better on a rating sheet that reflects the following criteria:

- The cutting plan will include all of the required items
- Trim allowances will be indicated
- Cutting sequence will be shown
- Accuracy
- 30-minute time limit

Achievement Criteria

Performance	The learner will perform the material usage calculations for all of the solid wood and sheet good items.
Conditions	The learner will be given: • The information from the completed drawing, cutting bill and cutting plan • Necessary materials • A suitable work area
Criteria	The learner will score 70% or better on a rating sheet that reflects the following criteria: • Accuracy • 45-minute time limit

Achievement Criteria

Performance	The learner will perform advanced geometric layouts.
Conditions	The learner will be given: • Specifications for layout of four different polygons and at least one elipse • Necessary materials • A suitable work area
Criteria	The learner will score 70% or better on a rating sheet that reflects the following criteria: • Accuracy • 45-minute time limit

Line (GAC): B USE ORGANIZATIONAL SKILLS

Competency: B3 Prepare an Estimate

Objectives

To be competent in this area, the individual must be able to:

- Describe estimate preparation.
- Describe the elements of a millwork estimate.
- Prepare a millwork estimate to specifications.

LEARNING TASKS	CONTENT

1. Describe pre-estimate tasks	• Project information
	  ○ Drawings
	  ○ Specifications
	  ○ Addenda
	  ○ Post-tender addenda

2. Describe the elements of a millwork estimate	• Quantity take-off
	• Include/exclude list
	• Costs
	  ○ Material
	  – Actual
	  – Waste
	  ○ Labour
	  – Direct
	  ○ Installation
	  ○ Shop
	  – Indirect
	  ○ Overhead
	  – Facility
	  – Administration
	  – Licenses and fees
	  – Vehicles and machinery
	  – Depreciation
	  ○ Delivery
	• Profit
	  ○ Material mark-up
	  ○ Contingency sum
	• Taxes
	  ○ PST
	  ○ GST
	  ○ Local

3. Perform quantity take-off procedures	• Process

LEARNING TASKS	CONTENT
4. Prepare a millwork estimate	• Common estimating errors • Application

Achievement Criteria

Performance — The learner will produce an estimate for the millwork items on a small commercial project.

Conditions — The learner will be given:

- A set of commercial blueprints
- Specifications
- Take off sheets
- Time/cost guidelines

Criteria — The learner will score 70% or better on a rating sheet that reflects the following criteria:

- The estimated items will be accurately scaled from the drawings
- Costs will be applied according to guidelines
- All elements of the estimate will be listed and calculated on the final tally sheet
- 2-hour time limit

Line (GAC): B USE ORGANIZATIONAL SKILLS

Competency: B5 Read Blueprints and Specifications

Objectives

To be competent in this area, the individual must be able to:

- Describe specifications.
- Read specifications.
- Describe commercial blueprints.
- Read commercial blueprints.

LEARNING TASKS	CONTENT

1. Describe specifications	• Purpose
	• Precedence
	• How to use
	• Standard format
	• Divisions of interest to joiners
	• Schedules
	  ○ Door
	  ○ Wall
	  ○ Window
	  ○ Room finish
	• Detail drawings

2. Read specifications	• Applications

3. Describe types of commercial blueprints	• Types
	  ○ Architectural
	  ○ Mechanical
	  ○ Electrical
	  ○ Structural
	  ○ Interior design
	• Reference symbols
	  ○ Direction
	  ○ Room number
	  ○ Detail, section and elevation
	  ○ Door
	  – Handling
	  ○ Window

4. Read commercial blueprints	• Applications

Achievement Criteria

Performance — The learner will answer 30 questions based on industry standard specifications.

Conditions — The learner will be given:

- A set of industry standard specifications
- A multiple choice test containing:
  - Five recall/recognition type items about the general purpose and usage of specifications
  - Fifteen research type items about the information contained within the specifications

Criteria — The learner will score 70% or better on a rating sheet that reflects the following criteria:

- No reference material allowed
- 30-minute time limit

Achievement Criteria

Performance — The learner will answer 10 questions based on blueprints, symbols and references.

Conditions — The learner will be given:

- A 10-question multiple choice test about the types and usage of commercial blueprints, and the symbols and references used on them

Criteria — The learner will score 70% or better on a rating sheet that reflects the following criteria:

- Answer all questions
- No reference materials allowed
- 8-minute time limit

Achievement Criteria

Performance — The learner will complete a multiple choice test requiring blueprint interpretation

Conditions — The learner will be given:

- Fifteen questions of research type items
- A set of standard commercial blueprints

Criteria — The learner will score 70% or better on a rating sheet that reflects the following criteria:

- 30-minute time limit

Line (GAC): B USE ORGANIZATIONAL SKILLS

Competency: B7 Apply Computer Skills

Objectives

To be competent in this area, the individual must be able to:

- Define the procedure for annotating and dimensioning CAD drawings.
- Perform CAD drafting functions.

LEARNING TASKS	CONTENT
1. Review Level Two	• CAD programs and initial drawings set up • Basic CAD commands
2. Describe CAD commands	• Basic text editing options • Basic dimensioning options • Style setting options
3. Use CAD software	• Applications

Achievement Criteria

Performance The learner will use CAD drawing and editing functions to complete a fully-dimensioned and annotated shop drawing.

Conditions The learner will be given:

- Project information
- A recent model computer with current CAD software

Criteria The learner will score 70% or better on a rating sheet that reflects the following criteria:

- Create and name a new drawing file
- Set drawing limits, layers and line types
- Set drawing units, snap and grid
- Create and use named styles for text and dimensioning
- The drawing will have:
  - A title block
  - A border
  - Three orthographic views (top, front and left hand)
  - At least one scaled detail view
- Save the drawing to a diskette
- 90-minute time limit

Line (GAC): C SELECT MATERIALS

Competency: C3 Select Solid Wood Species

Objectives

To be competent in this area, the individual must be able to:

- Describe the characteristics of 40 solid wood species.
- Identify samples of 40 solid wood species.

LEARNING TASKS	CONTENT
1. Review Level One	• 13 wood species
2. Review Level Two	• 13 wood species
3. Identify an additional 14 wood species	• Redwood • Sugar pine • Ponderosa pine • American beech • Satin walnut • Hickory • Gumwood • Brazilian walnut • Brazilian rosewood • Yellow poplar • Basswood • Jelutong • Pecan • Ramin

Achievement Criteria

Performance	The learner will identify 40 wood species.
Conditions	The learner will be given: • Unlabeled and randomly placed S4S samples of 40 wood species (listed in the above competency and including the lists from Levels One and Two)
Criteria	The learner will score 70% or better on a rating sheet that reflects the following criteria: • No reference materials • 45-minute time limit

Line (GAC): D USE HAND TOOLS

Competency: D2 Use Specialized Hand Tools

Objectives

To be competent in this area, the individual must be able to:

- Complete a project using specialized hand tools.

LEARNING TASKS	CONTENT

1. Describe specialized hand tools	• Woodcutting
	  ○ Spokeshave
	  ○ Compass plane
	  ○ Carving tools

2. Use specialized hand tools	• Application

Achievement Criteria

Performance	The learner will complete a project that will build on skills learned in years 1 and 2.
Conditions	The learner will be given: • Project information • A full set of joinery tools • Materials
Criteria	The learner will score 70% or better on a rating sheet that reflects the following criteria: • Complete within the tolerances listed on the project specifications • Time limit

Line (GAC): F USE WOODWORKING MACHINES

Competency: F8 Use Drilling and Boring Machines

Objectives

To be competent in this area, the individual must be able to:

- Describe multi-spindle boring machines.
- Use the multi-spindle boring machines.

LEARNING TASKS	CONTENT
1. Review Level Two	• Boring machines

2. Describe multi-spindle boring machines	• Purpose
	• Types
	  ○ Vertical
	  ○ Horizontal
	  ○ Adjustable
	• Parts
	• Operations
	• Accessories
	  ○ Quick change chucks
	• Safety
	• Adjustments
	• Troubleshooting
	• Maintenance
	• Bits

3. Use the multi-spindle boring machine	• Applications

Achievement Criteria

Performance	The learner will machine and dry assemble one casework item.
Conditions	The learner will be given: • Project information • A multi-spindle boring machine

Criteria	The learner will score 70% or better on a rating sheet that reflects the following criteria:
	• The casework item will have:
	  ○ Two gables
	  ○ A bottom
	  ○ At least one drawer rail
	  ○ A drilling pattern in the gables for shelf clips
	  ○ Accurate machining with snug joints
	  ○ Flush faces and edges
	  ○ Standard dowel and shelf hole spacing
	• 30-minute time limit

Line (GAC): F USE WOODWORKING MACHINES

Competency: F10 Use Routing Machines

Objectives

To be competent in this area, the individual must be able to:

- Describe the routing machines.
- Use routing machines.

LEARNING TASKS	CONTENT

1. Describe the pin routers	• Purpose
	• Types
	  ○ Overhead
	  ○ Inverted
	• Parts
	• Operations
	• Accessories
	• Safety
	• Adjustments
	• Troubleshooting
	• Maintenance
	• Bits

2. Use the pin routing machine	• Applications

Achievement Criteria

Performance	The learner will accurately machine a project to a template.
Conditions	The learner will be given: • Project information • An overhead router with cutters
Criteria	The learner will score 70% or better on a rating sheet that reflects the following criteria: • Cleanly cut • Free of chip out and burn marks • True to the template • 30-minute time limit

Line (GAC): F USE WOODWORKING MACHINES

Competency: F11 Use Sanding Machines

Objectives

To be competent in this area, the individual must be able to:

- Describe advanced sanding machines.
- Use advanced sanding machines.

LEARNING TASKS	CONTENT
1. Review Level One	• Basic sanding machine

2. Describe advanced sanding machines	• Purpose
	• Types
	  ○ Veneer
	  ○ Specialty edge
	  ○ Finish I
	• Parts
	• Operations
	• Accessories
	• Safety
	• Adjustments
	• Troubleshooting
	• Maintenance
	• Abrasive

3. Use wide-belt veneer sanding machines	• Applications

Line (GAC): F USE WOODWORKING MACHINES

Competency: F12 Use the Shaper and Power-Feed Attachment

Objectives

To be competent in this area, the individual must be able to:

- Describe the shaper and power-feed attachment.
- Use the shaper and power-feed attachment.

LEARNING TASKS	CONTENT

1. Describe the shaper	• Purpose
	• Types
	  ○ Manual
	  ○ CNC
	• Parts
	• Operations
	• Accessories
	• Safety
	• Adjustments
	• Troubleshooting
	• Maintenance
	• Cutter heads
	• Chucks

2. Describe the power-feed attachments	• Purpose • Types • Parts • Operations • Accessories • Safety • Adjustments • Troubleshooting • Maintenance
3. Use the shaper with a power-feed attachment	• Applications

Achievement Criteria

Performance	The learner will set up machines for a power run
Conditions	The learner will be given: • A shaper • A solid cutter head • A power-feed attachment
Criteria	The learner will score 70% or better on a rating sheet that reflects the following criteria: • The shaper will have the cutter head and fences accurately set and firmly fastened • All guards in place • The power-feed will be set to run the stock against the appropriate work surface • The machines will be set • A test run completed • 30-minute time limit

Line (GAC): F USE WOODWORKING MACHINES

Competency: F15 Describe Production Machinery

Objectives

To be competent in this area, the individual must be able to:

- Describe production machinery found in the joinery shop.

LEARNING TASKS

1. Describe production machinery

CONTENT

- Multiple ripsaw
- Moulder
  - Profile grinder
- Double-end tenoner
- Multi-head shaper
- CNC point-to-point machine
- CNC router
- CNC beam saw
- CNC machining centre
- CNC moulder

Line (GAC): G USE CNC MACHINES

Competency: G2 Use a CNC Panel Saw

Objectives

To be competent in this area, the individual must be able to:

- Describe the CNC panel saw.
- Program the CNC panel saw.
- Use the CNC panel saw.

LEARNING TASKS	CONTENT

1. Describe the CNC panel saw	• Purpose
	• Types
	  ○ Front-loading
	  ○ Rear-loading
	  ○ Angular
	  ○ Through-feed
	• Parts
	• Operations
	• Accessories
	  ○ Loaders
	• Safety
	• Adjustments
	• Troubleshooting
	• Maintenance
	• Blades

2. Program the CNC panel saw	• Optimization software
	• Manual input
	  ○ Single cut
	  ○ Sequence cutting
	  ○ Pattern cutting

3. Use the CNC panel saw	• Applications

Line (GAC): G USE CNC MACHINES

Competency: G3 Use Optimization Software

Objectives

To be competent in this area, the individual must be able to:

- Describe optimization software.
- Use optimization software.

LEARNING TASKS	CONTENT

1. Describe optimization software	• Purpose
	• Types
	  ○ Panel cutting
	  ○ Drilling
	  ○ Routing
	• Operations
	• Settings

2. Use optimization software	• Application

Achievement Criteria

Performance	The learner will complete a project using saw optimization software.
Conditions	The learner will be given: • Project information • A recent model computer with saw optimization software
Criteria	The learner will score 70% or better on a rating sheet that reflects the following criteria: • Setting of program defaults • Creation of a sheet stock library • Setting of cutting rules • Creation of a parts list • Creation and optimization of a cut list • Examining and editing cutting patterns where required • Exporting the cut list file to a post processing program • Saving the cut list to a diskette and making it ready for loading on the saw • 90-minute time limit

Line (GAC): H ASSEMBLE PRODUCTS

Competency: H2 Use Clamping and Pressing Machines

Objectives

To be competent in this area, the individual must be able to:

- Describe joinery shop presses.
- Use a joinery shop press.

LEARNING TASKS	CONTENT

1. Describe types of presses	• Purpose
	• Types
	  ○ Hand press
	  ○ Roller press
	  ○ Hydraulic press
	  – Cold
	  – Hot
	  – Sectioned
	  – Multi-platen
	  ○ Case clamp
	  ○ Hydraulic
	  – Pneumatic
	  – Vacuum press
	  ○ Bladder press
	• Parts
	• Operations
	• Accessories
	  ○ Loaders
	• Safety
	• Adjustments
	• Troubleshooting
	• Maintenance

2. Use a press	• Applications

Achievement Criteria

Performance	The learner will perform pressing operations.

Conditions	The learner will be given:
	• Project information
	• Materials
	• One of the following:
	  ○ Hydraulic cold press
	  ○ Hydraulic hot press
	  ○ Vacuum press
	  ○ Hand press

Criteria	The learner will score 70% or better on a rating sheet that reflects the following criteria: • Complete within the tolerances listed on the project specifications • Time limit

Line (GAC): I CONSTRUCT SPECIALTY ITEMS

Competency: I2 Construct a Staircase

Objectives

To be competent in this area, the individual must be able to:

- Describe a staircase and balustrade.
- Construct a staircase.

LEARNING TASKS	CONTENT
1. Define staircase terminology	• Components of a staircase • Balustrade
2. Describe staircase configurations	• Straight run • Wide L (quarter-turn) • Long L (quarter-turn) • Double L (U turn or half-turn) • Narrow U • Wide U • Winders • Landing • Geometric (circular) stairs • Spiral stairs
3. Describe stringer construction	• Notched stringers • Mitred stringers • Housed stringers • Semi-housed stringers • Dadoed stringers • Cleated stringers • Basic rules for stair construction
4. Describe regulations governing stair construction	• Prevailing building code • General • Stair dimensions • Landings • Winders • Handrails • Guards • Construction

LEARNING TASKS	CONTENT

5. Construct a straight run staircase	• Establish dimensions
	  ○ Total rise
	  ○ Unit rise and unit run
	  ○ Total run
	  ○ Length of the stringer
	  ○ Birdsmouth
	  ○ Stairwell openings
	• Laying out the stringer
	• Construct a straight run staircase to specifications

6. Construct a geometric (circular) staircase	• Establish dimensions
	  ○ Total rise
	  ○ Angle of turn
	  ○ Unit rise
	  ○ Unit run at inside and outside radii
	  ○ Unit run at inside and outside line of flight
	  ○ Total run, inside and outside
	  ○ Length of the stringers, inside and outside
	• Laying out the staircase
	• Construct a geometric (circular) staircase to specifications

Line (GAC): I CONSTRUCT SPECIALTY ITEMS

Competency: I3 Bend Wood and Composite Material

Objectives

To be competent in this area, the individual must be able to:

- Describe the procedure for layout of curves and producing templates.
- Describe the methods used for machining and assembling curved products.
- Construct curved products.

LEARNING TASKS

1. Describe the procedure for producing curved products

CONTENT

- Laying out
  - Planning for springback
- Templates
- Methods
  - Solid stock
    - Steam bending
    - Building up width
    - Grain orientation
    - Cutting stock
    - Laminating
    - Saw kerf
  - Composite material
    - Laminating
    - Saw kerf
  - Forms
    - Positive
    - Negative
    - Temporary
    - Permanent
      - Hollow frame
    - Pressing
  - Assembly procedures
    - Marking
    - Trueing
    - Fastening

2. Construct curved products

- Applications

Level 4

Cabinetmaker (Joiner)

Line (GAC): B USE ORGANIZATIONAL SKILLS

Competency: B2 Apply Layout Techniques

Objectives

To be competent in this area, the individual must be able to:

- Produce a shop sketch, shop drawing and cutting bill for a specialty product.

LEARNING TASKS	CONTENT
1. Review Year One	• Types and uses of shop drawings • Producing shop drawings • Compiling a typical cutting bill • Producing a cutting plan • Calculate material quantities and costs
2. Review Year Two	• Standard millwork sizes • Procedures for producing shop sketches • Basic geometric functions
3. Review Year Three	• Advanced geometric functions
4. Apply layout techniques	• Produce a working sketch for a specialty product • Prepare a full-sized layout for a specialty product • Cutting bill

Line (GAC): E USE PORTABLE POWER TOOLS

Competency: E7 Use Powder-Actuated Tools

Objectives

To be competent in this area, the individual must be able to:

- Describe the use of powder-actuated tools.
- Use powder-actuated tools.

LEARNING TASKS	CONTENT

1. Describe the use of powder-actuated tools	• Purpose
	• Types
	• Parts
	• Operations
	  ○ Concrete
	  ○ Steel
	• Accessories
	• Safety
	  ○ OHS Regulations and WCB Standards
	  ○ Hazard recognition
	• Maintenance
	• Fastener types
	• Cartridge types

2. Use powder-actuated tools	• Application

Line (GAC): F USE WOODWORKING MACHINES

Competency: F12 Use the Shaper and Power-Feed Attachment

Objectives

To be competent in this area, the individual must be able to:

- Describe shaper knife production.
- Use procedures for shaper knife production.

LEARNING TASKS	CONTENT
1. Review Level Three	• Shaper • Power-feed attachment

2. Describe the procedures for shaper knife production	• Describe mouldings
	  ○ History
	  ○ Uses
	  ○ Types
	• Layout
	  ○ Determine moulding profile
	  ○ Select cutter head
	  ○ Determine rake angle
	  ○ Lay out moulding shape
	• Produce knife
	  ○ Transfer to template
	  ○ Select knife blank
	  ○ Mark
	  ○ Cut profile
	  ○ Grind bevels and clearance angles
	  ○ Balance hone and test

3. Use procedures for shaper knife production	• Applications

Achievement Criteria

Performance	The learner will produce a layout and grinding template for the required profile.
Conditions	The learner will be given: • A drawing • A template materials • A desired profile
Criteria	The learner will score 70% or better on a rating sheet that reflects the following criteria: • The layout will be neatly drawn and accurate to within 1 mm • 60-minute time limit • The template will be an exact match to the layout • 30-minute time limit

Achievement Criteria

Performance — The learner will produce a shaper knife.

Conditions — The learner will be given:

- The above template
- A carbide scriber
- Grinding machines
- Honing stones
- Shaper steel

Criteria — The learner will score 70% or better on a rating sheet that reflects the following criteria:

- The knife will:
  - Match the template to within 0.1mm
  - Be neatly ground, with suitable relief angles
  - Be honed to razor edges
  - Be exactly balanced with a matching knife
- 60-minute time limit

Achievement Criteria

Performance — The learner will set up the machine for a template shaping operation.

Conditions — The learner will be given:

- Project information
- Materials
- A shaper
- A pair of matched knives with suitable cutter head and rub collar

Criteria — The learner will score 70% or better on a rating sheet that reflects the following criteria:

- The shaper will have the cutter head, rub collar and guards properly set and firmly fastened
- 20-minute time limit
- The finished project will be accurately machined
- No chip out, burning or distortion
- Time limit

Line (GAC): G USE CNC MACHINES

Competency: G1 Use a CNC Machining Centre

Objectives

To be competent in this area, the individual must be able to:

- Describe the CNC machining centre.
- Program the CNC machining centre.
- Use the CNC machining centre.

LEARNING TASKS	CONTENT

1. Describe the CNC machining centre	• Purpose
	• Types
	  ○ Pod system
	  ○ Flat table
	  ○ Gantry
	  ○ Through-feed
	• Parts
	• Operations
	• Accessories
	  ○ Loaders
	  – Robotic
	• Safety
	• Adjustments
	• Troubleshooting
	• Maintenance
	• Blades
	• Bits
	• Cutters

2. Program the CNC machining centre	• Optimization software • CAM software • Manual input
3. Use the CNC machining centre	• Applications

Line (GAC): H ASSEMBLE PRODUCTS

Competency: H2 Use Clamping and Pressing Machines

Objectives

To be competent in this area, the individual must be able to:

- Use a hydraulic press.

LEARNING TASKS	CONTENT
1. Review Level Three	• Hydraulic press
2. Use a hydraulic press	• Applications

Achievement Criteria

Performance The learner will perform a pressing operation.

Conditions The learner will be given:

- Project information
- Materials
- At least one of the following:
  - Hydraulic cold press
  - Hydraulic hot press
  - Vacuum press

Criteria The learner will score 70% or better on a rating sheet that reflects the following criteria:

- Complete within the tolerances listed on the project specifications
- Time limit

Line (GAC): I CONSTRUCT SPECIALTY ITEMS

Competency: I4 Fabricate a Veneered Panel

Objectives

To be competent in this area, the individual must be able to:

- Describe the slicing and matching of veneers.
- Describe veneer production equipment.
- Describe veneer lay-up procedures.
- Describe the use of veneer and veneered panels.
- Fabricate veneered panels.

LEARNING TASKS

1. Describe the slicing and matching of veneers

CONTENT

- Types of veneer cuts
  - Quarter slicing
  - Rift slicing
  - Flat slicing
  - Half-round cutting
  - Rotary cutting
  - Back cutting
- Matching within a panel
  - Balance
  - Centre
  - Book
  - Slip
  - Random
  - End
  - Special matches
    - Starburst pattern
    - Diamond pattern
    - Box pattern
    - Other patterns
- Grades
  - AA
  - A
  - B
- Care and storage
- Refer to QSI Section 500

LEARNING TASKS	CONTENT

2. Describe veneer production and equipment	• Veneer cutting equipment
	  ○ Saw
	  ○ Clippers
	• Veneer joining equipment
	  ○ Stitchers
	  ○ Edge gluers
	  ○ Tapers
	• Adhesive applications
	  ○ Manual
	  ○ Machine
	• Pressing equipment
	• Trimming
	  ○ Manual
	  ○ Machine

3. Describe veneer lay-up procedures	• Quantity requirements (according to macth)
	  ○ Core
	  ○ Face veneer
	  ○ Backing veneer
	• Lay out appropriate matching requirements
	• Cut
	• Stitch
	• Glue
	• Press
	• Trim
	• Sand
	• Troubleshooting

4. Describe the use of veneer and veneered panels	• Cabinets and furniture
	• Conference tables and reception counters
	• Wall panelling
	  ○ Grades
	  – Premium
	  – Custom
	• Matching panels within an area
	  ○ Pre-manufactured
	  ○ Sequence matched
	  ○ Blueprint

5. Fabricate a veneered panel	• Applications

Line (GAC): I CONSTRUCT SPECIALTY ITEMS

Competency: I5 Describe Woodwork Restoration

Objectives

To be competent in this area, the individual must be able to:

- Describe woodwork restoration.

LEARNING TASKS

1. Describe aspects of restoration

CONTENT

- Moulding styles
- Furniture assembly and disassembly methods
- Restoration requirements
  - Repair
  - Replicate
- Wood matching
- Imperfections such as scratches, chips and dents
- Adhesives
- Finishes
  - Stripping methods
  - Refinishing
    - Staining, bleaching, toning

Line (GAC): J APPLY A FINISH

Competency: J2 Select Finishing Materials

Objectives

To be competent in this area, the individual must be able to:

- Describe finishing materials and their functions.
- Select finishing materials.

LEARNING TASKS	CONTENT

1. Describe finishing materials and their functions	• Stains
	  ○ Water stains
	  ○ Latex stains
	  ○ Oil stains (penetrating)
	  ○ Oil stains (pigmented)
	  ○ Non-grain-raising (NGR) stains
	  ○ Spirit stains
	• Bleaches
	• Sealers
	  ○ Lacquer sanding
	  ○ Shellac
	  ○ Pigmented primer
	  ○ Alkyd
	  ○ Water-based
	• Paste fillers
	• Top coats
	  ○ Varnish
	  – Oleoresinous
	  – Conversion
	  ○ Lacquer
	  – Pre-catalyzed
	  – Post-catalyzed
	  – Water-borne
	• Polyesters
	• Polyurethane
	• Paints and enamels
	• Oil
	• Wax

2. Describe factors influencing finish selection	• Tone and figure • Physical environment ○ Application

LEARNING TASKS	CONTENT
	○ End use • Application equipment • Sheen • Toxicity • Cost • Time
3. Select finishing materials	• Applications

Line (GAC): J APPLY A FINISH

Competency: J3 Perform Finishing Operations

Objectives

To be competent in this area, the individual must be able to:

- Describe finishing equipment.
- Describe safety procedures for the finishing process.
- Describe quality control.
- Describe finishing procedures.
- Apply a finish.

LEARNING TASKS	CONTENT

1. Describe finishing equipment	• Brushes
	• Spray booth
	  ○ Open face
	  ○ Downdraft
	  ○ Air makeup
	• Pumps
	  ○ Airless
	  ○ Air assisted
	• Guns
	• High Volume Low Pressure (HVLP)
	• Conventional
	  ○ Gravity feed
	  ○ Pressure pot
	  ○ Siphon feed
	  ○ Bladder
	  ○ Air brush
	  ○ Airless
	  ○ Air-assist airless
	• Air supply system
	  ○ Components
	  ○ Troubleshooting
	• Mixing and measuring
	• Personal Protective Equipment (PPE)

2. Describe safety procedures for the finishing process	• Breathing protection • Eye protection • Skin protection • Ventilation • Fire protection and suppression

LEARNING TASKS	CONTENT
	• Explosions • Static protection • Storage • Disposal • Handling materials • Toxicity

3. Describe quality control	• Sheen
	• Colour
	• Smoothness
	• Number of coats
	• Thickness of coats
	• Wood finishing defects
	  ○ Causes
	  ○ Remedies

4. Describe finishing procedures	• Types
	  ○ Conventional air
	  ○ Airless
	  ○ Air assisted
	  ○ HVLP
	• Set up
	  ○ Work area
	  ○ Equipment
	  ○ Finishing material
	  ○ Product
	• Application
	  ○ Techniques
	  – System
	  – Materials
	  ○ Troubleshooting
	  – Faulty spray patterns
	  – Quality control
	• Clean up
	• Cutting and polishing a finished surface

5. Apply a finish	• Applications

Achievement Criteria

Performance	The learner will perform a finishing operation.
Conditions	The learner will be given: • Project information • Finishing materials • Spray equipment • Required workspace
Criteria	The learner will score 70% or better on a rating sheet that reflects the following criteria: • Sanding the project, making it ready for finish and performing any necessary repairs • Selecting the proper finishing materials for the project • Applying stains and/or sealers where required • Using the appropriate equipment, without runs or blotches on the wood surface • Setting up the available spray equipment, ready for application of finish • Evenly applying one topcoat, without runs, to a consistent final thickness and sheen • Shutting down • Cleaning and storing the spray equipment • Time limit

Line (GAC): K INSTALL ARCHITECTURAL MILLWORK

Competency: K1 Install Cabinets and Countertops

Objectives

To be competent in this area, the individual must be able to:

- Describe the installation of cabinets and countertops.

LEARNING TASKS

1. Describe the installation of cabinets and countertops

CONTENT

- Site survey
  - Site readiness
    - Heat
    - Humidity
    - Backing
    - Building access
      - Elevator
    - Coordination with other trades
- Receive millwork
  - Shipping list
  - Deliver to area/room
- Review drawings
- Layout
  - Floor and ceiling level
  - Walls plumb
  - Products within the room
  - Installation sequence
- Install
  - Plumb
  - Level
  - Seismic considerations
  - Scribing
  - Site assembly
  - Fastening
  - Final adjustment
- Clean up
  - Protection
  - Remove waste material

Line (GAC): K INSTALL ARCHITECTURAL MILLWORK

Competency: K2 Install Specialty Products

Objectives

To be competent in this area, the individual must be able to:

- Describe the installation of specialty products.

LEARNING TASKS

1. Describe the installation of specialty products

CONTENT

- Types
  - Panelling
  - Desks
  - Standing and running trim
  - Architectural ceilings
  - Doors
  - Frames
  - Sidelights
  - Glazed partitions
  - Solid surface
    - Counter tops
    - Window sills
    - Back panels
- Site survey
  - Site readiness
    - Heat
    - Humidity
    - Backing
    - Building access
      - Elevator
  - Coordination with other trades
- Receive millwork
  - Shipping list
  - Deliver to area/room
- Review drawings
- Layout
  - Floor and ceiling level
  - Walls plumb
  - Products within the room
  - Installation sequence
- Install
  - Plumb
  - Level
  - Seismic considerations
  - Scribing

LEARNING TASKS

CONTENT

- Site assembly
- Fastening
- Final adjustement
- Solid surface
  - Cutting
  - Joining
  - Polishing
  - Certification
  - Warranty
  - Hazards

- Clean up
- Protection
- Remove waste material

Line (GAC): L APPLY JOINERY PRINCIPLES

Competency: L1 Apply Joinery Principles

Objectives

To be competent in this area, the individual must be able to:

- Recall the application of joinery principles to practical problems.

LEARNING TASKS	CONTENT
1. Use safe work practices	• Safe work practices • WHMIS
2. Use organizational skills	• Drafting practices • Layout techniques • Estimate preparation • Quality standards • Blueprints and specifications • Communication • Computer skills
3. Select materials	• Structure and properties of wood • Lumber production, grading and handling • Wood species • Plywood • Composition board • Plastic laminates
4. Use hand tools	• Basic • Specialty
5. Use portable power tools	• Power sources • Power saws • Power drills and screw guns • Edge cutting tools • Power sanders • Power fastening tools • Powder-actuated tools
6. Use woodworking machines	• Breakout procedures • Radial-arm saws • Table saws • Jointers • Thickness planers

LEARNING TASKS	CONTENT
	• Panel saws • Band and scroll saws • Drilling and boring machines • Mortising and tenoning machines • Routing machines • Sanding machines • Shapers and power-feed attachments • Edge-banding machines • Lathes • Production machinery
7. Use CNC machines	• Machining center • Panel saw • Optimization software
8. Assemble products	• Hand-operated clamps • Clamping and pressing machines • Assembly techniques • Preparation for shipping
9. Construct specialty items	• Sashes, doors and frames • Staircases • Bending wood and composite materials • Veneered panels • Woodwork restoration
10. Apply a finish	• Surface preparation • Finishing materials • Finishing operations
11. Install architectural millwork	• Cabinets and countertops • Specialty products

Section 4

TRAINING PROVIDER STANDARDS

Facility Requirements

Classroom Area

- Minimum 22 square feet per student
- Comfortable seating and tables suitable for learning
- Compliance with the local and national fire code and occupational safety requirements
- Meets applicable municipal zoning bylaws for technical instruction and education facilities
- Overhead and multimedia projectors with a projection screen
- Whiteboard with marking pens and erasers
- Lighting controls to allow easy visibility of the projection screen while allowing students to take notes
- Windows must have shades or blinds to adjust sunlight
- Heating/air conditioning for comfort all year round
- Acoustics in the room must allow audibility of the instructor

Shop Area

- Minimum 3,000 square feet of shop area including a tool crib and work stations
- Minimum 20 foot ceiling height in main shop areas
- Adequate heating, lighting, ventilation and humidity control
- Adequate dust extraction system
- Refuse and recycling binds for used shop materials
- First-aid equipment/facilities
- Shops will support practical requirements as outlined in the program outline
- One workbench per two students, suitably sized to be used by two students

Lab Requirements

- Does not apply

Student Facilities

- Adequate eating area as per WorkSafeBC requiremnents (4.84 OHS Regulation and Guidelines)
- Adequate washroom facilities as per WorkSafeBC requirements (4.85 OHS Regulation and Guidelines)
- Personal storage lockers

Instructor's Office Space

- Adequate office space for student consultation
- Desk and filing space
- Computer
- Internet access
- Printer
- Adequate storage facilities for material and training aids
- Access to photocopier
- Telephone

Other

- Does not apply

Tools and Equipment

Shop Equipment

Required

- Biscuit joiner
- Circular saw
- Compound mitre saw
- Drills – Cordless
- Screwguns
- Routers 1-2hp
- Belt sander
- Orbital sanders – air
- Finish nailers – air
- Powder actuated tool
- Heat gun
- Claw hammers
- Wooden mallets
- Crow bars
- Syringes
- Hand staple gun
- Spade bits
- Forstner bits
- Combination bits
- Flycutters
- Multi-spur bits
- Vix bits
- Doweling jig
- Pipe clamp
- F clamp
- Spring clamp
- Spokeshaves
- Low-angle block plane
- Rabbet plane
- Side rabbet plane
- Jointer plane
- Domino joiner
- Mitre saw
- Jig saw
- Drills – 100v
- Routers 3-4hp
- Laminate trimmers
- Orbital sanders – 110v
- Staplers – air
- Brad nailers – air
- Power plane
- Iron
- Rubber mallets
- Wonder bars
- Glue brushes
- J-roller
- Twist drill bits
- Brad-point bits
- Countersink bits
- Holesaw bits
- Expansion bits
- Euro-hinge bits
- Plug cutters
- Handsrew clamp
- C clamp
- Strap clamp
- Cabinet scrapers
- Carving chisels
- Circular plane
- Bullnose rabbet plane
- Router plane
- Fore plane

- Wood rasps
- Burnisher
- Olfa knives
- Japanese saws
- Wheel dressers
- Putty knives
- Scale (weight)
- Wrenches
- Files – chainsaw
- Files – triangular
- Carbide scribers
- Pliers – channel
- Vise – grips
- End cutters
- Wire brush
- Cold chisels
- Centre punches
- Oil cans
- Gividers
- Vernier calipers
- Calipers (outside)
- Chalk lines
- Plumb bob
- Straight edhes
- Computers
- Printer calculators
- Metric scale rule
- Drill press
- Double spindle dowel boring machine
- CNC point to point machining centre
- Bench grinder
- Abrasive cut-off saw for metals
- Horizontal edge sander
- Disk sander
- Scratch awl
- Glass cutters
- Coping saw
- Moisture meter
- Glue spreader
- Slip stones
- Hack saw
- Socket sets
- Files – rat tail
- Files – auger bit
- Pliers – linesman
- Pliers – needle Nose
- Side cutters
- Aviation shears
- Ball-peen hammer
- Pin punches
- Grease guns
- Compasses
- Trammel points
- Calipers (inside)
- Awl
- Levels
- Framing square
- Flax curves
- Drafting tables
- Imperial scale rule
- Assorted drafting equipment
- Single spindle dowel boring machine
- Multiple spindle drill
- Mortising machine
- Grinding station for shaper knives
- Spindle sander
- Vertical edge sander
- Stroke sander

- Widebelt sander
- Tablesaw with scoring blade
- CNC panel saw
- Bandsaw for re-sawing
- Shaper – heavy duty
- Tenoner
- Table router
- Wood lathe
- Jointer
- Hot press
- Guillotine or veneer saw
- Automatic edgebanding machine
- Air compressor
- Spray booth
- Sliding push-fences
- Tablesaw L-Fences
- Saw horses
- Push blocks
- Work benches
- Clamping stands
- Circle jig bandsaw
- Misc. jigs for tablesaw
- Woodworker's bench vises
- 2-wheeled dolly
- 4-wheeled breakout dollies
- 4-wheeled panel dollies
- Large dust pans
- CAD software
- CNC saw software
- Tablesaw (Unisaw)
- Sliding panel saw
- Bandsaw for curved work
- Radial arm saw
- Power feeder for shaper
- Overhead or pin router
- Dovetailer
- Thickness planer
- Cold press
- Vacuum press
- Stitcher
- Dust collector
- Spray system
- Bench hooks
- Tablesaw fence hoods
- Outrigger horses
- Push sticks
- Feather boards
- Clamping bearers
- Assembly squares
- Misc. jigs for shaper
- Misc. jigs for routers
- Pallet jack
- 4-wheeled furniture dollies
- 4-wheeled high dollies
- Push brooms
- Industrial shop vacuums
- CNC router or P to P software
- Panel optimization software

Recommended

- Reciprocating saw
- Hot melt glue gun
- Deadblow hammers
- Mitre clamps
- Detail sander
- Tack hammers
- Warrington hammers
- Surform plane

- Mitre trimmer
- Rip saw
- Angle grinder
- Profile gauge
- Angle finder
- Laser level
- Plotter
- Profile grinder
- Pneumatic drum sander
- Straight-line rip saw
- Scroll saw
- CNC shaper
- Double end tenoner
- Glue mixing machine
- Heated edge press
- Case clamp
- Frame press
- Curtain coater
- Ellipse jig for router
- Hinge routing jig
- Rotating panel dollies
- Edgebander return system
- Steam bending box
- Keyhole saw
- Blitz saw
- Tin snips
- French curves
- T-square
- Stud finder
- Dowel drilling and insertion m/c
- Drum sander
- Profile sander
- Gang saw
- Moulder
- Multi-spindle shaper
- CNC router
- Glue spreading machine
- Clamp carrier
- Radio frequency gluer
- Curing oven
- Roll coater
- Downdraft table
- Lock boring jig
- Lift table
- Vacuum lifting device
- CAM software

Student Equipment (supplied by school)

Required

- Hearing protection
- Dust masks
- Respirators
- Safety glasses
- Safety goggles
- Face shields
- Surgical gloves
- Leather gloves
- Rubber gloves

- Tool box (One per student)
  - Mallet
  - Smoothing or Jack plane
  - Back saw
  - Hand scraper
  - Measuring tape
  - 12-in. Try square
  - Spring clamp
  - Machinist protractor
  - 12-in. ruler
  - Sanding block
  - Flat file with handle
  - 1/4-in. chisel
  - 3/4-in. chisel
  - Slip joint pliers
  - 1/32-in. nail set
  - #1 Robertson screwdriver
  - 6-in. flat-head screwdriver
  - Posi-drive head screwdriver
  - #2 Robertson screwgun bit
  - 1/8-in. drill bit
  - Hammer
  - Block plane
  - Hand saw
  - Dovetail saw
  - Marking gauge
  - Combination square
  - 4-in. Machinist square
  - Sliding T-bevel
  - Bannister brush
  - Lock and lockout ring
  - Utility knife
  - File card
  - 1/2-in. chisel
  - 1-in. chisel
  - 1/16-in. nail set
  - Sharpening stone
  - #2 Robertson screwdriver
  - 9-in. flat-head screwdriver
  - #1 Robertson screwgun bit
  - 1/16-in. drill bit
  - 3/16-in. drill bit
  - 3/16-in. drill bit

Recommended

- Tool box
  - Mortising gauge
  - 6-in. steel rule

Student Tools (supplied by student)

Required

- Workboots
- Drafting equipment

Recommended

- N/A

Reference Materials

Required Reference Materials

• Learning Guide Line A	Describe the Joinery Trade
• Learning Guide Line B	Identify Materials
• Learning Guide Line C	Identify Woodworking Joints
• Learning Guide Line D	Apply Layout Techniques
• Learning Guide Line E	Use Hand Tools
• Learning Guide Line F	Use Portable Power Tools
• Learning Guide Line G	Use Woodworking Machines
• Learning Guide Line H	Use Assembly Techniques
• Learning Guide Line I	Construct a Sash, Door and Frame
• Learning Guide Line J	Construct a Staircase
• Learning Guide Line K	Construct Curved Casework
• Learning Guide Line L	Fabricate a Veneered Panel
• Learning Guide Line M	Apply a Finish
• Learning Guide Line N	Describe Millwork Installation
• Learning Guide Line O	Use Computer Layout Software
• Woodworker's Hand Tools	Rick Peters
• Woodworker's Power Tools	Rick Peters
• Cabinetmaking and Millwork	John L Feirer

Recommended Resources

• Architectural Woodwork Standards	AWI/AWMAC
• Undertstanding Wood	R. Bruce Hoadley
• Identifying Wood	R. Bruce Hoadley
• The Complete Manual of Wood Veneering	W.A Lincoln
• World Woods in Color	W.A. Lincoln
• Power Tool Maintenance	Daniel W. Irvin
• Shaper Handbook	Eric Stephenson

Suggested Texts

- Not Applicable

NOTE:

This list of Reference Materials is for training providers. Apprentices should contact their preferred training provider for a list of recommended or required texts for this program.

Instructor Requirements

Occupation Qualification

The instructor must possess:

- A Cabinetmaker (Joiner) BC Certificate of Qualification preferably with an Interprovincial Red Seal endorsement
- Cabinetmaker (Joiner) Certificate of Qualification from another Canadian jurisdiction with an Interprovincial Red Seal endorsement only

Work Experience

A minimum of five years' experience working in the Cabinetmaker (Joiner) trade as a journeyperson.

Instructional Experience and Education

It is preferred that the instructor also possesses one of the following:

- An instructor Diploma or equivalent
- A Bachelors Degree in Education
- A Masters Degree in Education
- Supervisory experience
- Training experience

Appendices

Appendix A
Assessment Guidelines

Level 1 Grading Sheet: Subject Competency and Weightings

PROGRAM: IN-SCHOOL TRAINING: SKILLEDTRADESBC PORTAL CODE:	CABINET MAKER (JOINER) LEVEL 1 0013J001

LINE	SUBJECT COMPETENCIES	THEORY WEIGHTING	PRACTICAL WEIGHTING
A	Use of Safe Work Practices	8%	0%
B	Use Organizational Skills	20%	15%
C	Select Materials	33%	3%
D	Use Hand Tools	10%	10%
E	Use Portable Power Tools	8%	5%
F	Use Woodworking Machines	11%	30%
H	Assemble Products	7%	32%
J	Apply a Finish	3%	5%
	Total	**100%**	**100%**
CABINET MAKER (JOINER) in-school theory & practical subject competency weighting		25%	75%
Final in-school percentage score is entered into SkilledTradesBC Portal		IN-SCHOOL %	

In-school Percentage Score Combined theory and practical subject competency multiplied by	80%
Level Exam Percentage Score The exam score is multiplied by	20%
Final Percentage Score The final percentage score for determining credit is entered into SkilledTradesBC Portal.	FINAL%

Level 2 Grading Sheet: Subject Competency and Weightings

PROGRAM: IN-SCHOOL TRAINING: SKILLEDTRADESBC PORTAL CODE:	CABINET MAKER (JOINER) LEVEL 2 0013J002		
LINE	**SUBJECT COMPETENCIES**	**THEORY WEIGHTING**	**PRACTICAL WEIGHTING**
B	Use Organizational Skills	40%	24%
C	Select Materials	16%	6%
D	Use Hand Tools	8%	10%
F	Use Woodworking Machines	12%	25%
H	Assemble Products	5%	25%
I	Construct Specialty Items	19%	10%
	Total	**100%**	**100%**
CABINET MAKER (JOINER) in-school theory & practical subject competency weighting		25%	75%
Final in-school percentage score is entered into SkilledTradesBC Portal		IN-SCHOOL %	

In-school Percentage Score Combined theory and practical subject competency multiplied by	80%
Level Exam Percentage Score The exam score is multiplied by	20%
Final Percentage Score The final percentage score for determining credit is entered into SkilledTradesBC Portal.	FINAL%

Level 3 Grading Sheet: Subject Competency and Weightings

PROGRAM: IN-SCHOOL TRAINING: SKILLEDTRADESBC PORTAL CODE:	CABINET MAKER (JOINER) LEVEL 3 0013J003		
LINE	**SUBJECT COMPETENCIES**	**THEORY WEIGHTING**	**PRACTICAL WEIGHTING**
B	Use Organizational Skills	44%	23%
C	Select Materials	9%	3%
D	Use Hand Tools	0%	11%
F	Use Woodworking Machines	14%	30%
G	Use CNC Machines	5%	0%
H	Assemble Products	6%	18%
I	Construct Specialty Items	22%	15%
	Total	**100%**	**100%**
CABINET MAKER (JOINER) in-school theory & practical subject competency weighting		25%	75%
Final in-school percentage score is entered into SkilledTradesBC Portal		IN-SCHOOL %	

In-school Percentage Score Combined theory and practical subject competency multiplied by	80%
Standard Level Exam Percentage Score The exam score is multiplied by	20%
Final Percentage Score The final percentage score for determining credit is entered into SkilledTradesBC Portal.	FINAL%

Level 4 Grading Sheet: Subject Competency and Weightings

PROGRAM: IN-SCHOOL TRAINING: SKILLEDTRADESBC PORTAL CODE:	CABINET MAKER (JOINER) LEVEL 4 0013J004		
LINE	**SUBJECT COMPETENCIES**	**THEORY WEIGHTING**	**PRACTICAL WEIGHTING**
B	Use Organizational Skills	12%	6%
E	Use Portable Power Tools	5%	0%
F	Use Woodworking Machines	7%	20%
G	Use CNC Machines	8%	14%
H	Assemble Products	3%	20%
I	Construct Specialty Items	5%	20%
J	Apply a Finish	16%	20%
K	Install Architectural Millwork	4%	0%
L	Apply Joinery Principles	40%	0%
	Total	**100%**	**100%**

Calculated by the Training Provider:		
CABINET MAKER (JOINER) in-school theory & practical subject competency weighting	25%	75%
In-school Percentage Score Combined theory and practical subject competency multiplied by	80%	
Proprietary Exam Percentage Score The exam score is multiplied by	20%	
Final in-school percentage score is entered into SkilledTradesBC Portal	FINAL %	

All apprentices who complete Level 4 of the Cabinet Maker (Joiner) program with a FINAL level percentage score of 70% or greater will write the Interprovincial Red Seal examination as their final assessment.

SkilledTradesBC will enter the apprentices' Cabinet Maker (Joiner) Interprovincial Red Seal examination percentage score in SkilledTradesBC Portal. A minimum percentage score of 70% on the examination is required for a pass.

Appendix B
Glossary

Note: A Glossary of industry terms can be found in the Red Seal National Occupational Analysis available here.