SKILLEDTRADES BC

PROGRAM OUTLINE

Cabinetmaker

Implementation date: September 1, 2023

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CABINETMAKER
PROGRAM OUTLINE

APPROVED BY INDUSTRY
JUNE 2022

IMPLEMENTATION BEGINNING SEPTEMBER 1, 2023, AS PER TRANSITION PLAN

THIS BC PROGRAM HAS BEEN HARMONIZED AND IS BASED ON RSOS 2022

Developed by
SkilledTradesBC
Province of British Columbia

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Section 1

INTRODUCTION

CABINETMAKER

Foreword

The revised Cabinetmaker 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 Red Seal Occupational Standard (RSOS) (2022) 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 Cabinetmaker 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.

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 WorkSafe BC 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

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- Kyle Karlstedt

Industry Subject Matter Experts retained as outline reviewers:

- Matt Perkes

SkilledTradesBC would like to acknowledge the dedication and hard work of all the industry representatives appointed to identify the training requirements of the Cabinetmaker 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	Communicates program length and structure, and all pathways to completion	Illustrates the length and structure of the program	Illustrates the length and structure of the program, and pathway to completion	Illustrates the challenger pathway to Certificate of Qualification
OAC	Communicates the competencies that industry has defined as representing the scope of the occupation	Displays the competencies that an apprentice is expected to demonstrate in order to achieve certification	Displays the competencies apprentices will achieve as a result of program completion	Displays the competencies challengers 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	Shows 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	Shows 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	Shows 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, measurable 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
Assessment Guidelines	Shows the general areas of competency covered in each level of technical training, the theory and practical grading weight, and the calculation method for final percentage marks	Shows the general areas of competency covered in the technical training, the grading weight for each GAC, and the percentage of that time spent on theory versus practical application	Shows the general areas of competency covered in each level of technical training, the theory and practical grading weight, and the calculation method for final percentage marks	Shows the relative weightings of various general areas of competency within the occupation on which assessment is based

Section	Training Providers	Employers/Sponsors	Apprentices	Challengers
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
Appendix – Glossary of Acronyms			Defines program specific acronyms	

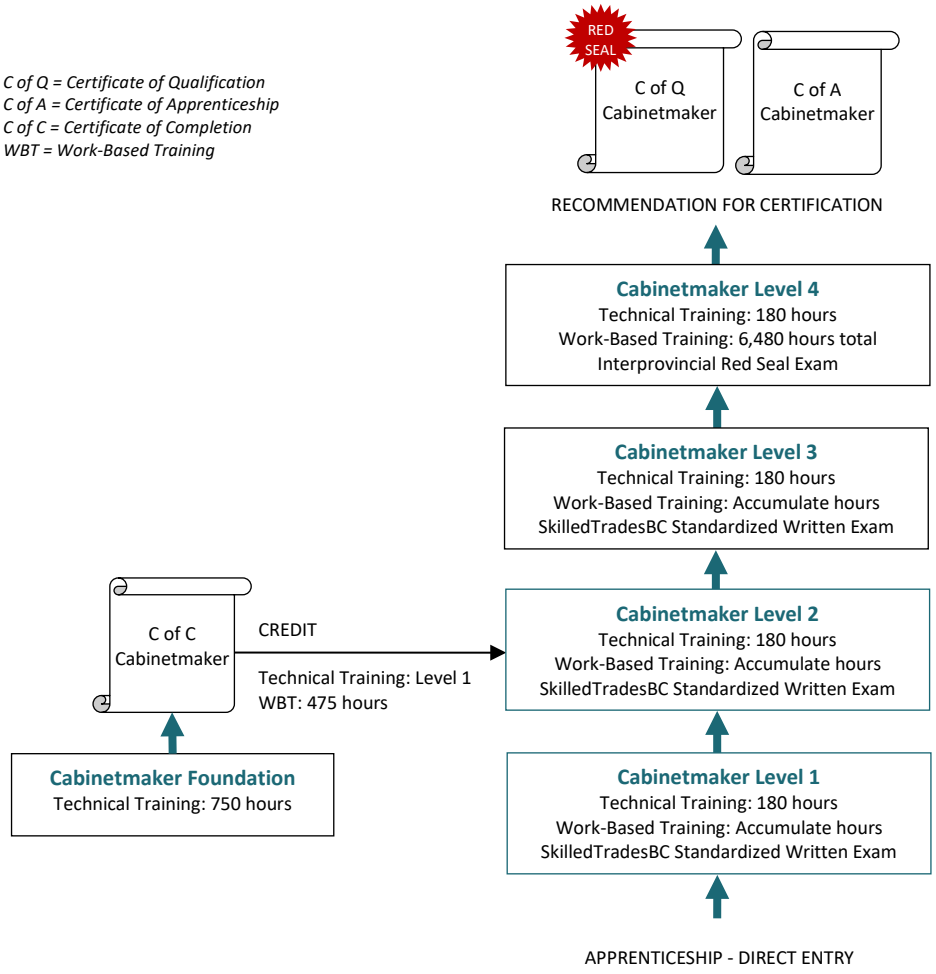
Section 2

PROGRAM OVERVIEW

Cabinetmaker

Program Credentialing Model

This graphic provides an overview of the Cabinetmaker apprenticeship pathway.



CROSS-PROGRAM CREDITS
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

Occupation Description: Cabinetmakers build, repair, finish and install residential and commercial cabinets (including hardware), wooden furniture and architectural millwork using a variety of woods, laminates, and other products. Cabinetmakers read drawings and specifications and prepare layouts. They also set up and operate woodworking equipment, both power and computerized, to machine wood products and composite materials. Cabinetmakers use various hand and power tools, and precision woodworking tools to perform their work. In some shops, cabinetmakers sand and finish the surfaces either before or after assembly. They also apply finishing products. Some may choose to specialize in areas such as stairs, veneering, sporting equipment, musical instruments, moulding, or finishing.

PERFORM SAFETY-RELATED FUNCTIONS A					
Maintain safe work environment A1	1				
Use personal protective equipment (PPE) and safety equipment A2	1				

USE TOOLS AND EQUIPMENT B					
Use hand, portable power, and pneumatic tools and equipment B1	1				
Use stationary power tools B2	1				
Maintain automated and CNC equipment B3			3	4	
Maintain finishing equipment B4			3	4	

ORGANIZE WORK C					
Interpret prints and drawings C1	1				
Plan projects C2	1				
Create designs C3	1	2			
Perform layout of cabinets, furniture, and architectural millwork C4	1	2			

PERFORM ROUTINE WORK PRACTICES D					
Handle materials, supplies, and products D1	1				
Fabricate jigs and templates D2		2	3		
Build prototypes D3			3		
Select hardware D4	1	2			
Select adhesives and sealants D5	1				

USE COMMUNICATION AND MENTORING TECHNIQUES **E**	Use communication techniques E1	1				
	Use mentoring techniques E2			4		
MACHINE COMPONENTS USING STATIONARY AND PORTABLE POWER TOOLS **F**	Breakout solid wood F1	1				
	Dress solid wood F2	1				
	Shape solid wood F3	1				
	Breakout sheet materials F4	1				
	Machine sheet materials F5	1				
	Machine joints F6	1				
	Perform sanding F7	1				
MACHINE COMPONENTS USING AUTOMATED AND CNC EQUIPMENT **G**	Set up automated and CNC equipment G1			3	4	
	Operate automated and CNC equipment G2			3	4	
CREATE CURVED COMPONENTS USING WOOD AND COMPOSITE MATERIALS **H**	Build forms H1			3	4	
	Perform curved laminating H2			3	4	
	Steam-form wood H3			3	4	
LAMINATE WOOD AND COMPOSITE MATERIALS **I**	Arrange materials for laminating I1	1	2			
	Apply adhesive for laminating I2	1	2			
	Clamp pieces together I3	1	2			

APPLY VENEER J	Select veneers J1	Prepare veneer and substrate J2	Adhere veneer to substrate J3	Perform final clean-up of laminated sheets J4	
	3	3	3	3 4	
APPLY LAMINATE SHEETS K	Select laminate sheets K1	Prepare laminate sheets and substrate K2	Adhere laminate sheets to substrate K3	Perform final clean-up of laminated sheets K4	
	1 2	1 2	2	2	
ASSEMBLE CABINETS AND FURNITURE L	Assemble cabinet components L1	Assemble furniture components L2	Combine cabinet and furniture components into final assemblies L3		
	1 2 3	1 2 3	1 2 3		
ASSEMBLE ARCHITECTURAL MILLWORK PRODUCTS M	Assemble architectural millwork components in shop M1	Assemble architectural fixtures in shop M2			
	4	4			
PREPARE SURFACE FOR FINISHING N	Repair imperfections N1	Prepare parts for finishing N2	Perform final sanding for surfaces N3		
	1	1	1		
FINISH WOOD PRODUCTS O	Prepare finishing materials O1	Apply finishing material manually O2	Spray on finishing material O3		
	2 3	2 3	2 3		

MODIFY PRODUCTS TO SITE CONDITIONS P	Cut access holes on site P1		Scribe products to fit on site P2		
	2		2		
INSTALL CABINETS AND COUNTERTOPS Q	Perform final on-site assembly and fastening of cabinets and countertops Q1		Finalize installation of cabinets and countertops Q2		
	2		2		
INSTALL ARCHITECTURAL MILLWORK PRODUCTS AND MOULDINGS R	Perform final on-site assembly and fastening of architectural millwork products R1		Install mouldings R2		Finalize installation of architectural millwork products and mouldings R3
	4		4		4
BUILD STAIRS AND BALUSTRADES S	Lay out stair and balustrade components S1		Machine stair and balustrade components S2		Assemble stairs and balustrades S3	Install stairs and balustrades S4
	3		3		3	3
INSTALL SOLID SURFACE MATERIALS T	Breakout materials for solid surface T1		Fabricate solid surface materials T2		Install solid surface materials T3	
	3		3		3	
CREATE DECORATIVE WOODWORK U	Perform marquetry U1		Perform carving U2		Perform wood turning U3	
	4		4		4	

RESTORE WOODWORK	Repair woodwork for restoration					Refinish woodwork for restoration				
V					V1					V2
				4					4	

Training Topics and Suggested Time Allocation

CABINETMAKER – LEVEL 1

			% of Time Allocated to:		
		% of Time	Theory	Practical	Total
Line A	**PERFORM SAFETY-RELATED FUNCTIONS**	**5%**	**70%**	**30%**	**100%**
A1	Maintain safe work environment		✓		
A2	Use personal protective equipment (PPE) and safety equipment		✓	✓	
Line B	**USE TOOLS AND EQUIPMENT**	**5%**	**20%**	**80%**	**100%**
B1	Use hand, portable power, and pneumatic tools and equipment		✓	✓	
B2	Use stationary power tools		✓	✓	
Line C	**ORGANIZE WORK**	**20%**	**25%**	**75%**	**100%**
C1	Interpret prints and drawings		✓		
C2	Plan projects		✓	✓	
C3	Create designs		✓	✓	
C4	Perform layout of cabinets, furniture, and architectural millwork		✓	✓	
Line D	**PERFORM ROUTINE WORK PRACTICES**	**10%**	**80%**	**20%**	**100%**
D1	Handle materials, supplies, and products		✓		
D4	Select hardware		✓		
D5	Select adhesives and sealants		✓	✓	
Line E	**USE COMMUNICATION AND MENTORING TECHNIQUES**	**2%**	**100%**	**0%**	**100%**
E1	Use communication techniques		✓		
Line F	**MACHINE COMPONENTS USING STATIONARY AND PORTABLE POWER TOOLS**	**20%**	**25%**	**75%**	**100%**
F1	Breakout solid wood		✓	✓	
F2	Dress solid wood		✓	✓	
F3	Shape solid wood		✓	✓	
F4	Breakout sheet materials		✓		
F5	Machine sheet materials		✓	✓	
F6	Machine joints		✓	✓	
F7	Perform sanding		✓	✓	
Line I	**LAMINATE WOOD AND COMPOSITE MATERIALS**	**5%**	**60%**	**40%**	**100%**
I1	Arrange materials for laminating		✓	✓	
I2	Apply adhesive for laminating		✓	✓	
I3	Clamp pieces together		✓	✓	
Line K	**APPLY LAMINATE SHEETS**	**3%**	**100%**	**0%**	**100%**

			% of Time Allocated to:		
		% of Time	Theory	Practical	Total
K1	Select laminate sheets		✓		
K2	Prepare laminate sheets and substrates		✓		
Line L	**ASSEMBLE CABINETS AND FURNITURE**	**20%**	**20%**	**80%**	**100%**
L1	Assemble cabinet components		✓	✓	
L2	Assemble furniture components		✓	✓	
L3	Combine cabinet and furniture components into final assemblies		✓		
Line N	**PREPARE SURFACE FOR FINISHING**	**10%**	**20%**	**80%**	**100%**
N1	Repair imperfections		✓	✓	
N2	Prepare parts for finishing		✓	✓	
N3	Perform final sanding for surfaces		✓	✓	
	Total Percentage for Cabinetmaker Level 1	**100%**			

Training Topics and Suggested Time Allocation

CABINETMAKER – LEVEL 2

			% of Time Allocated to:		
		% of Time	Theory	Practical	Total
Line C	**ORGANIZE WORK**	**10%**	**20%**	**80%**	**100%**
C3	Create designs		✓	✓	
C4	Perform layout of cabinets, furniture, and architectural millwork		✓	✓	
Line D	**PERFORM ROUTINE WORK PRACTICES**	**5%**	**10%**	**90%**	**100%**
D2	Fabricate jigs and templates		✓	✓	
D4	Select hardware		✓	✓	
Line I	**LAMINATE WOOD AND COMPOSITE MATERIALS**	**5%**	**10%**	**90%**	**100%**
I1	Arrange materials for laminating		✓	✓	
I2	Apply adhesive for laminating		✓	✓	
I3	Clamp pieces together		✓	✓	
Line K	**APPLY LAMINATE SHEETS**	**5%**	**10%**	**90%**	**100%**
K1	Select laminate sheets		✓	✓	
K2	Prepare laminate sheets and substrate		✓	✓	
K3	Adhere laminate sheets to substrate		✓	✓	
K4	Perform final clean-up of laminated sheets		✓	✓	
Line L	**ASSEMBLE CABINETS AND FURNITURE**	**40%**	**20%**	**80%**	**100%**
L1	Assemble cabinet components		✓	✓	
L2	Assemble furniture components		✓	✓	
L3	Combine cabinet and furniture components into final assemblies		✓	✓	
Line O	**FINISH WOOD PRODUCTS**	**15%**	**50%**	**50%**	**100%**
O1	Prepare finishing materials		✓	✓	
O2	Apply finishing material manually		✓	✓	
O3	Spray on finishing materials		✓	✓	
Line P	**MODIFY PRODUCTS TO SITE CONDITIONS**	**5%**	**50%**	**50%**	**100%**
P1	Cut access holes on site		✓		
P2	Scribe products to fit on site		✓	✓	
Line Q	**INSTALL CABINETS AND COUNTERTOPS**	**15%**	**30%**	**70%**	**100%**
Q1	Perform final on-site assembly and fastening of cabinets and countertops		✓	✓	
Q2	Finalize installation of cabinets and countertops		✓	✓	
	Total Percentage for Cabinetmaker Level 2	**100%**			

Training Topics and Suggested Time Allocation

CABINETMAKER – LEVEL 3

			% of Time Allocated to:		
		% of Time	Theory	Practical	Total
Line B	**USE TOOLS AND EQUIPMENT**	**5%**	**90%**	**10%**	**100%**
B3	Maintain automated and CNC equipment		✓	✓	
B4	Maintain finishing equipment		✓		
Line D	**PERFORM ROUTINE WORK PRACTICES**	**10%**	**30%**	**70%**	**100%**
D2	Fabricate jigs and templates		✓	✓	
D3	Build prototypes		✓	✓	
Line G	**MACHINE COMPONENTS USING AUTOMATED AND CNC EQUIPMENT**	**10%**	**50%**	**50%**	**100%**
G1	Set up automated and CNC equipment		✓	✓	
G2	Operate automated and CNC equipment		✓	✓	
Line H	**CREATE CURVED COMPONENTS USING WOOD AND COMPOSITE MATERIALS**	**35%**	**25%**	**75%**	**100%**
H1	Build forms		✓	✓	
H2	Perform curved laminating		✓	✓	
H3	Steam-form wood		✓		
Line J	**APPLY VENEER**	**10%**	**50%**	**50%**	**100%**
J1	Select veneers		✓	✓	
J2	Prepare veneer and substrate		✓	✓	
J3	Adhere veneer to substrate		✓	✓	
J4	Perform final clean-up of laminated sheets		✓	✓	
Line L	**ASSEMBLE CABINETS AND FURNITURE**	**5%**	**30%**	**70%**	**100%**
L1	Assemble cabinet components		✓	✓	
L2	Assemble furniture components		✓	✓	
L3	Combine cabinet and furniture components into final assemblies		✓		
Line O	**FINISH WOOD PRODUCTS**	**10%**	**40%**	**60%**	**100%**
O1	Prepare finishing materials		✓	✓	
O2	Apply finishing material manually		✓	✓	
O3	Spray on finishing material		✓	✓	
Line S	**BUILD STAIRS AND BALUSTRADES**	**5%**	**100%**	**0%**	**100%**
S1	Lay out stair and balustrade components		✓		
S2	Machine stair and balustrade components		✓		
S3	Assemble stairs and balustrades		✓		
S4	Install stairs and balustrades		✓		
Line T	**INSTALL SOLID SURFACE MATERIALS**	**10%**	**30%**	**70%**	**100%**
T1	Breakout materials for solid surface		✓	✓	
T2	Fabricate solid surface materials		✓	✓	
T3	Install solid surface materials		✓	✓	
	Total Percentage for Cabinetmaker Level 3	**100%**			

Training Topics and Suggested Time Allocation

CABINETMAKER – LEVEL 4

			% of Time Allocated to:		
		% of Time	Theory	Practical	Total
Line B	**USE TOOLS AND EQUIPMENT**	**10%**	**50%**	**50%**	**100%**
B3	Maintain automated and CNC equipment		✓	✓	
B4	Maintain finishing equipment		✓	✓	
Line E	**USE COMMUNICATION AND MENTORING TECHNIQUES**	**10%**	**100%**	**0%**	**100%**
E2	Use mentoring techniques		✓		
Line G	**MACHINE COMPONENTS USING AUTOMATED AND CNC EQUIPMENT**	**15%**	**50%**	**50%**	**100%**
G1	Set up automated and CNC equipment		✓	✓	
G2	Operate automated CNC equipment		✓	✓	
Line H	**CREATE CURVED COMPONENTS USING WOOD AND COMPOSITE MATERIALS**	**15%**	**25%**	**75%**	**100%**
H1	Build forms		✓	✓	
H2	Perform curved laminating		✓	✓	
H3	Steam-form wood		✓	✓	
Line J	**APPLY VENEER**	**15%**	**25%**	**75%**	**100%**
J3	Adhere veneer to substrate		✓	✓	
J4	Perform final clean-up of laminated sheets		✓	✓	
Line M	**ASSEMBLE ARCHITECTURAL MILLWORK PRODUCTS**	**15%**	**25%**	**75%**	**100%**
M1	Assemble architectural millwork components in shop		✓	✓	
M2	Assemble architectural fixtures in shop		✓	✓	
Line R	**INSTALL ARCHITECTURAL MILLWORK PRODUCTS AND MOULDINGS**	**5%**	**100%**	**0%**	**100%**
R1	Perform final on-site assembly and fastening of architectural millwork products		✓		
R2	Install mouldings		✓		
R3	Finalize installation of architectural millwork products and mouldings		✓		
Line U	**CREATE DECORATIVE WOODWORK**	**10%**	**20%**	**80%**	**100%**
U1	Perform marquetry		✓	✓	
U2	Perform carving		✓		
U3	Perform wood turning		✓	✓	
Line V	**RESTORE WOODWORK**	**5%**	**100%**	**0%**	**100%**
V1	Repair woodwork for restoration		✓		
V2	Refinish woodwork for restoration		✓		
	Total Percentage for Cabinetmaker Level 4	**100%**			

Section 3

PROGRAM CONTENT

CABINETMAKER

Level 1

Cabinetmaker

Line (GAC): A PERFORM SAFETY-RELATED FUNCTIONS

Competency: A1 Maintain safe work environment

Objectives

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

- Describe maintaining a safe work environment, including:
  - WorkSafeBC and regulations
  - Policies, procedures, and practices
  - Emergency equipment
  - Fire safety

LEARNING TASKS	CONTENT

1. Describe safety regulations	• Workers' Compensation Act
	• Occupational Health and Saftey (OHS)
	  ○ Committees
	• WorkSafeBC
	  ○ WHMIS
	  ○ Exposure control plan
	  ○ Investigations and reports
	  ○ Workplace inspections
	• Rights and responsibilities
	  ○ Due dilligence
	  ○ Injury reporting
	  ○ Right to refuse unsafe work
	  ○ Roles
	  ▪ Employee
	  ▪ Employer
	  ▪ Supervisor
	  ▪ WorkSafeBC
	• Training and certification requirements

2. Describe safe work practices	• Mental health and well-being
	• Housekeeping
	• Lockout procedures
	• Ergonomics
	  ○ Repetititve tasks
	• Personnel apparel
	  ○ Professionalism
	  ○ Clothing
	  ○ Jewellery
	  ○ Hair

3. Describe material handling procedures and equipment	• Procedures ○ Lifting

LEARNING TASKS	CONTENT
	○ Storage ○ Unloading/loading • Material handling equipment ○ Dolly ○ Pump truck ○ Fork lift • Material type ○ Plastic laminate ○ Veneer ○ Sheet goods • Overweight/oversized material
4. Describe emergency equipment	• Emergency shutoffs • Fire control systems • Emergency exits • First aid facilities • Emergency contacts/phone numbers • Muster station
5. Describe health and environmental hazards	• Chemicals ○ Glues ○ Finishing material • Wood toxicity • Dust exposure • Site specific hazards ○ Exposed/unfinished work ○ Working at height ○ Working with other trades
6. Describe fire safety	• Identifying hazards ○ Flammable liquids ○ Electrical wiring ○ Combustible materials • Equipment ○ Fire suppression systems ○ Fire extinguishers ▪ Types • Procedures and personnel ○ Evacuation ○ Fire marshalls

Line (GAC): A PERFORM SAFETY-RELATED FUNCTIONS

Competency: A2 Use personal protective equipment (PPE) and safety equipment

Objectives

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

- Describe use of safety equipment
- Use PPE

LEARNING TASKS	CONTENT

1. Describe use of safety equipment	• Regulations
	  ○ Policies
	• Types
	  ○ Decibel monitor
	  ○ Eye wash station
	  ○ Fire extinguisher
	• Inspection
	• Maintenance
	• Storage

2. Use PPE	• Selection • Storage • Maintenance ○ Sanitizing • Fit • Clothing and footwear • Eye protection • Fall protection • Hearing protection • Respiratory protection • Gloves

Achievement Criteria

Performance	The learner will wear appropriate PPE for job tasks.
Conditions	The learner will be given • Instructions • Procedures • Equipment
Criteria	The learner will be evaluated on • Safety • Accuracy • Procedure

Line (GAC): B USE TOOLS AND EQUIPMENT

Competency: B1 Use hand, portable power, and pneumatic tools and equipment

Objectives

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

- Use hand tools
- Use portable power and pneumatic tools and equipment
- Maintain hand tools
- Maintain portable power and pneumatic tools and equipment

LEARNING TASKS	CONTENT

1. Use hand tools	• Safety
	• Purpose
	• Operation
	• Accessories
	• Adjustments
	• Types
	  ○ Measuring
	  ○ Layout
	  ○ Cutting
	  ▪ Saws
	  ▪ Chisels
	  ▪ Scrapers
	  ○ Planing
	  ○ Boring
	  ○ Metal working
	  ○ Honing stones
	  ○ Fastening
	  ○ Files
	• Maintenance
	• Storage
	• Lubrication
	• Environmental factors

2. Use portable power tools	• Safety • Purpose • Operation ○ Lockout procedure • Set up • Accessories • Adjustments

LEARNING TASKS	CONTENT

	• Types
	  ○ Saws
	  ○ Circular
	  ○ Sabre
	  ○ Reciprocating
	  ○ Drills
	  ○ Planers
	  ○ Routers
	  ○ Spline cutters
	  ○ Sanders
	  ○ Staplers
	• Maintenance
	• Storage
	• Lubrication
	• Environmental factors

3. Use pneumatic tools	• Safety
	• Purpose
	• Operation
	  ○ Lockout procedure
	• Set up
	• Accessories
	• Adjustments
	• Types
	  ○ Fastening guns
	  ▪ Staple
	  ▪ Pin
	  ▪ Upholstery
	• Maintenance
	• Storage
	• Lubrication
	• Environmental factors

4. Use portable power equipment	• Safety • Purpose • Operation ○ Lockout procedure • Set up • Accessories • Adjustments • Types

LEARNING TASKS

CONTENT

- Compressors
- Air dryers
- Dust collector
- Maintenance
- Storage
- Lubrication
- Environmental factors

Achievement Criteria

Performance	The learner will perform maintenance on equipment.
Conditions	The learner will be given • Instructions • Procedures • Materials • Equipment
Criteria	The learner will be evaluated on • Safety • Accuracy • Procedure

Line (GAC): B USE TOOLS AND EQUIPMENT

Competency: B2 Use stationary power tools

Objectives

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

- Use stationary power tools and equipment
- Maintain stationary power tools and equipment

LEARNING TASKS	CONTENT

1. Use stationary power tools and equipment	• Safety
	• Purpose
	• Operation
	  ○ Calibrate
	  ○ Lock out procedure
	• Set up
	• Accessories
	• Adjustments
	• Types
	  ○ Compressor
	  ○ Grinder
	  ○ Planer
	  ○ Saws
	  ○ Jointer
	  ○ Sanders
	  ○ Thickness planer
	  ○ Drill press
	  ○ Dovetail machine
	  ○ Lathe
	  ○ Boring machine
	  ○ Shaper
	  ▪ Shaper knives
	  ○ Power-feed attachments
	• Storage
	• Environmental factors

2. Maintain stationary power tools and equipment	• Procedures
	  ○ Setting up and maintaining guards
	  ○ Cleaning
	  ○ Lubricating
	• Inspecting tools and equipment
	  ○ Pulleys
	  ○ Worn components

LEARNING TASKS	CONTENT
	○ Dull blades ○ Defective components ○ Damaged equipment • Reporting inoperable tools and equipment

Achievement Criteria

Performance	The learner will use stationary power tools.
Conditions	The learner will be given • Instructions • Procedures • Materials • Equipment
Criteria	The learner will be evaluated on • Safety • Accuracy • Procedure

Line (GAC): C ORGANIZE WORK

Competency: C1 Interpret prints and drawings

Objectives

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

- Describe elements of drawings
- Describe views, lines, and symbols on drawings
- Interpret drawings

LEARNING TASKS	CONTENT

1. Describe elements of drawings	• Types of drawings
	  ○ Architectural
	  ▪ Symbols
	  ▪ Page references
	  ▪ Scales
	  ○ Electrical
	  ○ Mechanical
	  ○ Structural
	  ○ Residential
	  ○ Commercial
	• Site plans

2. Describe views, lines, and symbols on drawings	• Types of views
	  ○ Plan views
	  ○ Elevation drawings
	  ○ Section drawings
	  ○ Detail drawings
	  ○ Isometric
	  ○ Pictorial
	• Types of lines
	  ○ Object
	  ○ Contour
	  ○ Dimension
	  ○ Extension
	  ○ Hidden
	  ○ Section
	  ○ Break
	• Types of symbols
	  ○ Section
	  ○ Detail
	  ○ Mechanical

LEARNING TASKS	CONTENT

3. Interpret drawings	• Codes and Standards
	  ○ Architectural Woodworking Manufacturing Association of Canada (AWMAC)
	  ○ Canadian Standards Association (CSA)
	  ○ National Kitchen and Bath Association (NKBA)
	• Tools
	  ○ Slide ruler
	• Reviewing prints
	• Converting measurements
	• Material take offs
	• Identifying information in drawings and specifications
	• Determining millwork
	• Determining project requirements

Line (GAC): C ORGANIZE WORK

Competency: C2 Plan projects

Objectives

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

- Describe planning a project
- Prepare an estimate

LEARNING TASKS	CONTENT

1. Describe planning a project	• Project objectives
	• Tools and equipment
	• Regulations
	• Drawing specifications
	• Site accessibility
	  ○ Elevators
	  ○ Loading docks
	• Verifying job site measurements
	• Materials and hardware
	• Resource and capacity assessment
	  ○ Determining schedules
	  ○ Space
	  ○ Labour hours
	• Sequence of work

2. Prepare an estimate	• Include/exclude list
	• Common estimating errors
	• Costs
	  ○ Material
	  ▪ Actual
	  ▪ Waste
	  ○ Labour
	  ▪ Direct
	  ▪ Indirect
	  ▪ Installation
	  ▪ Shop
	  ○ Overhead
	  ○ Delivery
	• Profit
	  ○ Calculating shop rate
	  ○ Material mark-up
	  ○ Contingency sum

Achievement Criteria

Performance	The learner will prepare an estimate.
Conditions	The learner will be given • Instructions • Specifications • Drawings
Criteria	The learner will be evaluated on • Accuracy • Procedure

Line (GAC): C ORGANIZE WORK

Competency: C3 Create designs

Objectives

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

- Produce drawings
- Use CAD software

LEARNING TASKS	CONTENT

1. Produce drawings	• Standards
	  ○ AWMAC
	• Specifications
	• Rough sketches
	• Orthographic
	  ○ Top
	  ○ Front
	  ○ Section
	• Pictorial
	  ○ Isometric drawings
	  ○ Cabinet oblique drawings
	  ○ Perspective drawings
	• Challenges

2. Use CAD software	• Applications • Initial drawing set-up • Commands • New drawing • View ports • Printing

Achievement Criteria 1

Performance	The learner will create a basic shop drawing by hand.
Conditions	The learner will be given • Specifications • Instructions • Ruler
Criteria	The learner will be evaluated on • Accuracy • Procedure

Achievement Criteria 2

Performance	The learner will produce a shop drawing using CAD.
Conditions	The learner will be given • Instructions • Specifications • Procedures • Equipment
Criteria	The learner will be evaluated on • Accuracy • Procedure

Line (GAC): C ORGANIZE WORK

Competency: C4 Perform layout of cabinets, furniture, and architectural millwork

Objectives

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

- Describe layout process
- Describe producing a cutting bill
- Calculate lumber quantity and costs
- Calculate sheet good quantity and costs

LEARNING TASKS	CONTENT

1. Describe layout process	• Select and use layout tools
	  ○ Trammel points
	  ○ Straight edges
	  ○ Tape measures
	  ○ Levels
	  ○ Electronic measuring devices
	  ○ CAD measuring devices
	• Scale
	• Design requirements
	• Templates
	• Geometric calculations

2. Describe producing a 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

3. Calculate lumber quantity and costs	• Measurements
	  ○ Board foot
	  ○ Linear measure
	  ○ Standard rounding rules

LEARNING TASKS	CONTENT
	○ Percentage of waste
4. Calculate sheet good quantity and costs	• Types ○ Plywood ○ Particle board ○ Medium-density fibreboard (MDF) • Pricing • Percentage of waste

Achievement Criteria

Performance	The learner will calculate board footage and cost for a project.
Conditions	The learner will be given • Instructions • Procedures • Materials
Criteria	The learner will be evaluated on • Safety • Accuracy • Procedure

Line (GAC): D PERFORM ROUTINE WORK PRACTICES

Competency: D1 Handle materials, supplies, and products

Objectives

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

- Describe considerations when handling and storing materials
- Describe procedures for handling materials
- Describe the handling and storage of solid wood

LEARNING TASKS	CONTENT

1. Describe considerations when handling and storing materials	• Safety
	  ○ PPE
	• Regulations and certifications
	  ○ Forest Stewardship Council (FSC)
	  ○ Leadership in Energy and Environmental Design (LEED)
	  ○ WHMIS
	  ○ Safety Data Sheets (SDS)
	  ○ Product Data Sheets (PDS)
	• Storage
	  ○ Flammable products
	  ○ Ventilation
	• Timing
	• Transportation
	  ○ Equipment required
	• Labelling
	• Environmental considerations
	  ○ Moisture
	  ○ Heat
	• Disposal
	• Recycling

2. Describe procedures for handling materials	• Safety • Securement • Packaging • Shipping ○ Reassembly of knock-down millwork • Receiving

LEARNING TASKS	CONTENT

3. Describe the handling and storage of solid wood	• General handling procedures
	• Temporary storage
	• Permanent storage
	• Environmental considerations
	  ○ Moisture
	  ○ Heat

Line (GAC): D PERFORM ROUTINE WORK PRACTICES

Competency: D4 Select hardware

Objectives

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

- Describe considerations for hardware selection
- Describe hardware take off

LEARNING TASKS	CONTENT

1. Describe considerations for hardware selection	• Types
	  ○ Specialty
	  ○ Safety
	  ○ Drawers
	  ○ Hinges
	  ○ Fasteners
	• Applications
	• Compatibility
	  ○ Materials
	  ○ Brands
	• Trends

2. Describe hardware take off	• Interpreting drawings • Calculating hardware requirements • Selecting hardware

Line (GAC): D PERFORM ROUTINE WORK PRACTICES

Competency: D5 Select adhesives and sealants

Objectives

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

- Describe considerations for selection of adhesives and sealants
- Describe characteristics of adhesives
- Apply adhesives and sealants

LEARNING TASKS	CONTENT

1. Describe considerations for selection of adhesives	• Safety
	  ○ PPE
	  ○ Ventilation
	• Project specifications
	• Regulations
	  ○ FSC
	  ○ WHMIS
	  ○ Regional
	• Characteristics of project components
	• Cost
	• Handling
	  ○ Toxicity
	  ○ Storage/shelf life
	  ○ Open and close time
	• Assembly area conditions
	• Bond type

2. Describe characteristics of adhesives	• Types
	  ○ Natural
	  ○ Synthetic
	  ○ Waterproof
	  ○ Edge banding glue
	• Viscosity
	• Curing time
	• Colour
	• Environmental considerations
	  ○ Heat
	  ○ Moisture

3. Apply adhesives	• Manufacturer specifications • Equipment

LEARNING TASKS	CONTENT
	○ Rollers ○ Mixing ○ Spreading ○ Curing
4. Describe considerations for selection of sealants	• Safety ○ PPE ○ Ventilation • Project specifications • Characteristics of project components • Handling ○ Toxicity ○ Storage/shelf life ○ Open and close time • Assembly area conditions • Compatibility
5. Apply sealants	• Manufacturer specifications • Equipment ○ Caulking gun ○ Spreading ○ Curing

Line (GAC): E USE COMMUNICATION AND MENTORING TECHNIQUES

Competency: E1 Use communication techniques

Objectives

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

- Describe effective communication skills
- Describe communication expectations

LEARNING TASKS	CONTENT

1. Describe effective communication skills	• Verbal and written instructions
	• Professionalism
	  ○ Participation
	  ○ Responsibilites
	  ○ Conflict resolution
	  ○ Punctuality
	  ○ Respect
	• Trade terminology
	• Harrassment and discrimination
	• Constructive feedback
	• Safety and information meetings

2. Describe communication expectations	• Purpose
	  ○ Safety
	  ○ Project coordination
	  ○ Instructions
	  ○ Procedures
	• Networking
	• Digital/social media
	  ○ Etiquette
	• Open communciation
	• Methods and equipment
	  ○ Phone
	  ○ Digital
	  ○ Written

Line (GAC): F MACHINE COMPONENTS USING STATIONARY AND PORTABLE POWER TOOLS

Competency: F1 Breakout solid wood

Objectives

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

- Describe considerations and properties of solid wood
- Identify structure of solid wood
- Describe considerations for breaking out solid wood
- Breakout solid wood

LEARNING TASKS	CONTENT

1. Describe considerations and properties of solid wood	• Common solid woods
	  ○ Hardwoods
	  ▪ Beech
	  ▪ White oak
	  ▪ Red oak
	  ▪ Poplar
	  ▪ Maple
	  ▪ Walnut
	  ▪ Birch
	  ○ Softwoods
	  ▪ Spruce
	  ▪ Pine
	  ▪ Fir
	  ▪ Cedar
	• Characteristics of wood
	  ○ Grain orientation
	  ○ Toxicity
	  ○ Pores
	  ○ Rays
	  ○ Specific gravity
	  ○ Expansion and contraction
	• Considerations for wood types
	• Softwood vs. hardwood

2. Identify structure of solid wood	• Outer bark • Inner bark • Cambium • Sapwood • Heartwood • Pith

LEARNING TASKS	CONTENT
	• Rays • Annual growth rings

3. Describe considerations for breaking out solid wood	• Tools and Equipment
	  ○ Size
	• Grading
	  ○ Hardwood
	  ○ Softwood
	• Cutting methods
	  ○ Hardwood
	  ○ Softwood
	  ○ Seasoning wood
	• Grain structure
	• Defects
	  ○ Natural
	  ▪ Decay
	  ▪ Knots
	  ▪ Shakes and splits
	  ▪ Reaction wood
	  ▪ Insects
	  ○ Processing
	  ○ Case hardening
	  ○ Manufacturing imperfections
	  ▪ Checks
	  ▪ Collapse
	  ▪ Honeycombing
	  ▪ Weathering
	• Wood selection
	• Layout
	  ○ Marking the board

4. Breakout solid wood	• Safety
	• Tools and equipment
	  ○ Radial arm saw
	  ○ Mitre saw
	  ○ Jointer
	  ○ Planer
	• Using breakout procedures
	  ○ Single pieces
	  ○ Laminated pieces

Achievement Criteria 1

NOTE:	Competency F1 and F2 will be assessed together in this achievement criteria.
Performance	The learner will breakout and dress solid wood.
Conditions	The learner will be given • Specifications • Instructions • Tools and equipment • PPE • Nominal lumber
Criteria	The learner will be evaluated on • Safety • Procedure • Accuracy

Achievement Criteria 2

Performance	The learner will identify samples of wood species.
Conditions	The learner will be given: • Instructions • Materials • Unlabeled dressed wood species samples
Criteria	The learner will be evaluated on • Accuracy

Line (GAC): F MACHINE COMPONENTS USING STATIONARY AND PORTABLE POWER TOOLS

Competency: F2 Dress solid wood

Objectives

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

- Describe saw blades
- Dress solid wood
- Describe detail machining

LEARNING TASKS	CONTENT

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

2. Dress solid wood	• Safety
	• Tools and equipment
	• Following dressing sequence
	  ○ Jointing, planing, and ripping solid wood to desired width, length, and thickness
	• Correcting performance problems
	  ○ Cupping
	  ○ Warping
	  ○ Dull equipment

3. Describe detail machining	• Checking layout • Checking cutting bill • Planning sequence of machine operations • Utilization of material • Cutting square • Accuracy • Checking material thickness variations

Achievement Criteria

NOTE: Competency F1 and F2 will be assessed together in F1.

Line (GAC): F MACHINE COMPONENTS USING STATIONARY AND PORTABLE POWER TOOLS

Competency: F3 Shape solid wood

Objectives

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

- Shape solid wood
- Describe the shaper
- Describe the power-feed attachments

LEARNING TASKS	CONTENT

1. Shape solid wood	• Safety
	  ○ PPE
	• Tools and equipment
	  ○ Hand
	  ▪ Sandpaper
	  ▪ Chisels
	  ○ Power
	  ▪ Routers
	  ▪ Shapers
	• Setting up power feeders
	• Securing project to jig
	• Profile solid wood
	  ○ Avoiding tear outs
	• Verifying shape and dimensions

2. Describe the shaper	• Safety
	• Purpose
	• Types
	  ○ Manual
	  ○ Computer numeric control (CNC)
	• Accessories
	• Components
	• Operations
	• Adjustments
	• Troubleshooting
	• Maintenance

3. Describe the power-feed attachments	• Safety • Purpose • Types

LEARNING TASKS

CONTENT

- Components
- Accessories
- Adjustments
- Troubleshooting
- Maintenance

Achievement Criteria

Performance	The learner will route a profile on a solid wood surface.
Conditions	The learner will be given • PPE • Instructions • Tools • Materials
Criteria	The learner will be evaluated on • Safety • Accuracy • Procedure • No tear out

Line (GAC): F MACHINE COMPONENTS USING STATIONARY AND PORTABLE POWER TOOLS

Competency: F4 Breakout sheet materials

Objectives

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

- Describe considerations and properties of sheet materials
- Describe sheet goods breakout procedure

LEARNING TASKS	CONTENT

1. Describe considerations and properties of sheet materials	• Safety
	• Types
	  ○ Laminates
	  ○ Plywood
	  ○ Speciality
	• Material considerations
	  ○ Aluminium
	  ○ Textured laminate
	  ○ Gloss
	• Edge treatment

2. Describe sheet goods breakout procedure	• Tools and equipment
	  ○ Inspection
	  ▪ Blade sharpness
	  ▪ Operating condition
	• Developing and reviewing cut plan/list
	• Selecting sheet goods
	• Cutting sheet material to size

Line (GAC): F MACHINE COMPONENTS USING STATIONARY AND PORTABLE POWER TOOLS

Competency: F5 Machine sheet materials

Objectives

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

- Describe cutting equipment
- Machine sheet materials
- Describe detail machining

LEARNING TASKS	CONTENT

1. Describe cutting equipment	• Safety
	• Handling
	• Maintenance
	• Uses
	• Sheet materials characteristics
	  ○ Plywood
	  ○ MDF
	  ○ Laminate
	  ○ Specialty
	• Stationary equipment types
	  ○ CNC
	  ○ Saws
	  ○ Router
	  ○ Shaper
	  ○ Edge bander
	• Portable equipment types
	  ○ Circular saw
	  ○ Routers
	• Blades
	  ○ Scoring
	  ○ Rip
	  ○ Cross-cut
	  ○ Combination
	• Bits
	• Specialty

2. Machine sheet materials	• Safety
	  ○ Dull equipment
	  ○ Blade selection
	  ○ Physical space requirements
	  ○ Lifting
	• Cutting sequence

LEARNING TASKS	CONTENT

	• Layout
	  ○ Interpret cut plan/list
	• Correcting performance problems
	  ○ Cupping
	  ○ Warping

3. Describe detail machining	• Checking layout • Checking cutting bill • Planning sequence of machine operations • Utilization of material • Cutting square • Accuracy • Checking material thickness variations • Edging treatment • Profiles

Achievement Criteria

Performance	The learner will machine sheet goods for a project.
Conditions	The learner will be given • PPE • Instructions • Tools • Materials
Criteria	The learner will be evaluated on: • Safety • Accuracy • Procedure • No chip out

Line (GAC): F MACHINE COMPONENTS USING STATIONARY AND PORTABLE POWER TOOLS

Competency: F6 Machine joints

Objectives

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

- Select joints
- Fabricate joints

LEARNING TASKS	CONTENT

1. Select joints	• Safety
	• Material
	• Advantages and disadvantages
	• Joint types
	  ○ Dowelled
	  ○ Tongue and groove
	  ○ Lock-mitre
	  ○ Biscuit
	  ○ Dado
	  ○ Rabbet
	  ○ Mitre
	  ○ Lap
	  ○ Butt
	  ○ Mortise-and-tenon
	  ○ Scarf
	  ○ Finger
	  ○ Dovetail
	  ○ Box
	  ○ Specialty

2. Fabricate joints	• Tools and equipment • Verifying cut list • Using jigs and templates • Selecting adhesive • Producing sample • Environmental considerations ○ Humidity

Achievement Criteria

Performance	The learner will fabricate a joint for a project.
Conditions	The learner will be given • PPE • Instructions • Tools • Materials
Criteria	The learner will be evaluated on • Safety • Accuracy • Fit • Procedure

Line (GAC): F MACHINE COMPONENTS USING STATIONARY AND PORTABLE POWER TOOLS

Competency: F7 Perform sanding

Objectives

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

- Identify sanding equipment
- Perform sanding

LEARNING TASKS	CONTENT

1. Identify sanding equipment	• Safety
	• Adjustments
	• Troubleshooting
	• Maintenance
	• Stationary equipment
	  ○ Wide belt
	  ○ Stroke
	  ○ Spindle
	  ○ Edge
	• Portable tools
	  ○ Belt
	  ○ Orbital
	  ○ Oscillating
	• Hand tools
	  ○ Cabinet scrapers
	  ○ Sanding block
	  ▪ Hard
	  ▪ Cork
	  ▪ Profiles
	• Sandpaper
	  ○ Grit selection
	  ○ Types
	  ○ Cloth backed
	  ○ Paper backed
	  ○ Open
	  ○ Closed
	  ○ Material
	  ○ Aluminum oxide
	  ○ Silicon carbide

2. Perform sanding	• Preliminary ○ Interior assemblies

LEARNING TASKS

CONTENT

- Identifying reason for sanding
  - Defects
  - Adhesive residue
  - Scratches/dents
- Grain direction
- Power equipment
  - Feed rate
- Verifying thickness
- Verifying finish

Achievement Criteria

Performance	The learner will perform sanding on a project in preparation for finishing.
Conditions	The learner will be given • PPE • Instructions • Tools • Materials
Criteria	The learner will be evaluated on • Safety • Accuracy • Procedure • Defect-free

Line (GAC): I LAMINATE WOOD AND COMPOSITE MATERIALS

Competency: I1 Arrange materials for laminating

Objectives

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

- Identify materials for laminating
- Arrange materials for basic laminating

LEARNING TASKS	CONTENT

1. Identify materials for laminating	• Characteristics
	  ○ Porosity
	  ○ Density
	  ○ Grain structure
	• Material type
	  ○ Solid wood
	  ○ Composite materials
	  ▪ Solid surface
	  ▪ Plastics

2. Arrange materials for basic laminating	• Grain direction
	  ○ Face grain
	  ○ End grain
	• Inspecting for defects
	  ○ Knots
	  ○ Mineral streaks
	  ○ Insect damage
	  ○ Colour
	• Laminating sequence
	• Finish application
	  ○ Opaque vs. transparent

Achievement Criteria

NOTE: GAC I will be assessed together in Competency I3.

Line (GAC): I LAMINATE WOOD AND COMPOSITE MATERIALS

Competency: I2 Apply adhesive for laminating

Objectives

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

- Identify tools and equipment
- Apply adhesive to materials for basic lamination

LEARNING TASKS	CONTENT

1. Identify tools and equipment	• Safety
	  ○ Ventilation
	• Tools and equipment
	  ○ Rollers
	  ○ Brushes
	  ○ Rags
	• Environmental conditions
	  ○ Temperature
	  ○ Humidity

2. Apply adhesive to materials for basic lamination	• Selecting adhesive
	  ○ Moisture considerations
	  ○ Thermal setting
	• Open time
	• Close time
	• Curing time
	• Determining application method
	• Spreading adhesive

Achievement Criteria

NOTE: GAC I will be assessed together in Competency I3.

Line (GAC): I LAMINATE WOOD AND COMPOSITE MATERIALS

Competency: I3 Clamp pieces together

Objectives

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

- Describe hand-operated clamps
- Clamp material together for lamination

LEARNING TASKS	CONTENT

1. Describe hand-operated clamps	• Safety
	• Selection
	• Types
	  ○ Bar
	  ○ Pipe
	  ○ Spring
	  ○ Hand screw
	  ○ C-clamp
	  ○ Band
	  ○ Mitre
	  ○ F-clamp
	• Accessories
	  ○ Caulk

2. Clamp material together for lamination	• Clamping pressure • Alignment • Edge protection • Removing excess glue and squeeze-out • Physical space and storage • Removing clamps

Achievement Criteria

NOTE:	GAC I will be assessed together in this Achievement Criteria.
Performance	The learner will laminate material for a project.
Conditions	The learner will be given • Instructions • Procedures • Materials • Equipment
Criteria	The learner will be evaluated on • Safety • Accuracy • Procedure

Line (GAC): K APPLY LAMINATE SHEETS

Competency: K1 Select laminate sheets

Objectives

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

- Identify types of plastic laminates
- Identify handling and storage techniques

LEARNING TASKS	CONTENT

1. Identify types of plastic laminates	• Manufacturing process
	  ○ Composition of plastic laminates
	  ○ Sheet sizes
	• Safety
	• Considerations
	  ○ Handling
	  ○ Storage
	  ○ Grain direction
	  ○ Finish
	• Thickness
	  ○ General purpose
	  ○ Post form
	  ○ Solid core
	  ○ Specialty
	• Grades
	  ○ Horizontal
	  ○ Vertical
	  ○ Backer
	  ○ Fire-retardant
	  ○ Commercial
	  ○ Laboratory
	  ○ Bending
	  ○ Specialty
	  ○ Liner
	• Size

2. Identify handling and storage techniques	• Positioning • Moving • Humidity • Edges • Contamination • Support • Accessibility

LEARNING TASKS	CONTENT

	• Inventory
	• Inspecting
	  ○ Defect
	  ○ Damage

Line (GAC): K APPLY LAMINATE SHEETS

Competency: K2 Prepare laminate sheets and substrates

Objectives

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

- Describe selection of substrate materials
- Describe preparation of plastic laminate
- Describe preparation of laminate sheets

LEARNING TASKS	CONTENT

1. Describe selection of substrate materials	• Types
	  ○ MDF
	  ○ Particle board
	  ○ Plywood
	• Advantages
	• Disadvantages
	• Preparing the core

2. Describe preparation of plastic laminate	• Checks before application
	  ○ Temperature
	  ○ Humidity
	  ○ Cleanliness
	  ○ Grain/pattern direction
	  ○ Time constraints
	  ○ Equipment check
	  ○ Sequence

3. Describe preparation of laminate sheets	• Safety • Tools and equipment • Cutting laminate sheets to size • Handling laminate sheets • Joining laminate edges • Cutting substrate

Line (GAC): L ASSEMBLE CABINETS AND FURNITURE

Competency: L1 Assemble cabinet components

Objectives

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

- Prepare assembly space
- Select cabinet components
- Describe subassembly components
- Apply assembly procedures

LEARNING TASKS	CONTENT

1. Prepare assembly space	• Tools and equipment
	  ○ Assembly platform
	  ○ Sighting boards
	  ○ Corner-to-corner measuring rods
	  ○ Tape measure
	  ○ Strongbacks
	  ○ Clamps
	• Adhesive selection
	• Crown bearers
	• Fasteners
	• Drawing and cut list
	• Pre-finishing

2. Identify cabinet components	• Gables
	• Tops
	• Bottoms
	• Doors
	• Backs
	• Drawer faces
	• Hardware
	  ○ Fasteners
	  ○ Hinges
	  ▪ Concealed
	  ▪ Butt
	  ▪ Piano
	  ▪ Pivot
	  ○ Soft-closing
	  ○ Locks
	  ○ Pulls
	  ○ Integrated slides
	  ○ Full-extension slides

LEARNING TASKS	CONTENT

	• Detail machining
	  ○ 32 mm drilling system
	  ○ Joint types

3. Select cabinet components	• Considerations
	  ○ Joints
	  ○ Size
	  ○ Finish
	• Hardware
	  ○ Knock down
	  ○ Fixed

4. Describe subassembly components	• Subassembly components
	  ○ Drawer boxes
	  ○ Base frame/toe-kick
	  ○ Face frame

5. Apply assembly procedures	• Checking material
	  ○ Size
	  ○ Type
	• Detailing machining
	  ○ 32 mm drilling system
	  ○ Joint types
	• Dry fit
	  ○ Checking sequence
	  ○ Organizing parts
	  ○ Clamping
	• Applying adhesive
	  ○ Types
	• Clamping/fastening
	• Checking for square/twist
	• Cleaning
	• Labelling
	• Joining sub-assembly to cabinet components

Achievement Criteria

NOTE:	Competency L1 and L2 will be assessed in this Achievement Criteria.
Performance	The learner will assemble a project.
Conditions	The learner will be given • Instructions • Procedures • Materials • Equipment
Criteria	The learner will be evaluated on • Safety • Accuracy • Procedure

Line (GAC): L ASSEMBLE CABINETS AND FURNITURE

Competency: L2 Assemble furniture components

Objectives

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

- Prepare assembly space
- Select furniture components
- Describe subassembly components
- Apply assembly procedures

LEARNING TASKS	CONTENT

1. Prepare assembly space	• Tools and equipment
	  ○ Assembly platform
	  ○ Sighting boards
	  ○ Corner-to-corner measuring rods
	  ○ Tape measure
	  ○ Strongbacks
	  ○ Clamps
	• Adhesive selection
	• Crown bearers
	• Fasteners
	• Drawing and cut list
	• Pre-finishing

2. Identify furniture components	• Rails
	• Arms
	• Legs
	• Aprons
	• Backs
	• Tops
	• Bottoms
	• Hardware
	  ○ Fasteners
	  ○ Hinges
	  ▪ Concealed
	  ▪ Butt
	  ▪ Piano
	  ▪ Pivot
	  ▪ Leaf
	  ○ Soft-closing
	  ○ Locks

		○ Pulls ○ Integrated slides ○ Full-extension slides • Plinth
3.	Select furniture components	• Considerations ○ Joints ○ Size ○ Finish ○ Expansion and contractions • Hardware ○ Slotted hardware for expansion and contraction ○ Decorative
4.	Describe subassembly components	• Subassembly components ○ Table pedestal ○ Base frame/toe-kick
5.	Apply assembly procedures	• Checking material ○ Size ○ Type • Detailing machining ○ Joint types ○ Profiles • Dry fit ○ Checking sequence ○ Organizing parts ○ Clamping • Applying adhesive ○ Types • Clamping/fastening • Checking for square/twist • Cleaning • Labelling • Joining sub-assembly to furniture components

Achievement Criteria

NOTE: Competency L1 and L2 will be assessed in the L1 Achievement Criteria.

Line (GAC): L ASSEMBLE CABINETS AND FURNITURE

Competency: L3 Combine cabinet and furniture components into final assemblies

Objectives

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

- Describe final assembly techniques

LEARNING TASKS	CONTENT

1. Describe final assembly techniques	• Safety
	• Tools and equipment
	• Considerations
	  ○ Hardware placement does not impede operation
	  ○ Trends
	  ▪ Leather
	  ▪ Fur
	  ▪ Rustic
	  ▪ Wire brushing
	• Combining components
	  ○ Face frame
	  ○ Web frame
	  ○ Base/toe kick
	  ○ Drawers/doors
	  ○ Glass
	• Installing hardware
	  ○ Specialty
	  ○ Decorative
	• Applying decorative moulding and edging

Line (GAC): N PREPARE SURFACE FOR FINISHING

Competency: N1 Repair imperfections

Objectives

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

- Repair imperfections

LEARNING TASKS	CONTENT

1. Repair imperfections	• Tools and equipment
	  ○ Iron
	  ○ Chisels
	  ○ Routers
	  ○ Sandpaper
	• Wood properties
	• Imperfections
	  ○ Scratches
	  ○ Dents
	  ○ Glue
	  ○ Chip/tear out
	• Repairing imperfections
	  ○ Steaming
	  ○ Sanding
	  ○ Scraping excess glue
	  ○ Patching
	  ○ Puttying

Achievement Criteria

NOTE: GAC N will be assessed together in this Achievement Criteria.

Performance: The learner will apply a patch with consistent grain and colour on appropriate material.

Conditions: The learner will be given

- Instructions
- Procedures
- Materials
- Equipment

Criteria: The learner will be evaluated on

- Safety
- Accuracy
- Procedure

Line (GAC): N PREPARE SURFACE FOR FINISHING

Competency: N2 Prepare parts for finishing

Objectives

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

- Prepare parts for finishing

LEARNING TASKS	CONTENT

1. Prepare parts for finishing	• Safety
	• Tools and equipment
	• Considerations
	  ○ Identifying parts for pre-finishing on assemblies
	  ○ Checking approved sample for sanding procedure
	• Hardware
	  ○ Removing for finishing
	  ○ Using for finishing
	  ▪ Eye hooks
	  ▪ Hanging bars/brackets
	• Masking surfaces
	• Transporting
	  ○ Dollies
	  ○ Sub-contracting

Achievement Criteria

NOTE: GAC N will be assessed together in Achievement Criteria N1.

Line (GAC): N PREPARE SURFACE FOR FINISHING

Competency: N3 Perform final sanding for surfaces

Objectives

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

- Describe abrasives
- Perform final sanding for surfaces

LEARNING TASKS	CONTENT
1. Describe abrasives	• Types of abrasives • Grit sizes • Coatings • Backings • Sheet sizes • Adhesives

2. Perform final sanding for surfaces	• Safety
	  ○ Masks
	  ○ Ventilation
	• Tools and equipment
	  ○ Sandpaper
	  ○ Sanding block
	  ○ Flashlight
	  ○ Magnifying glass
	• Considerations
	  ○ Contaminants
	  ▪ Food
	  ▪ Chemical
	  ▪ Environment
	  ○ Storage
	• Procedure
	  ○ Selecting grit of sandpaper
	  ○ Removing cross grain marks
	  ○ Removing sharp edges
	  ○ Removing excess dust

Achievement Criteria

NOTE: GAC N will be assessed together in Achievement Criteria N1.

Level 2

Cabinetmaker

Line (GAC): C ORGANIZE WORK

Competency: C3 Create designs

Objectives

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

- Draft a project

LEARNING TASKS	CONTENT
1. Draft a project	• Tools and equipment • Creating CAD drawings from specifications

Achievement Criteria

Performance	The learner will use CAD to draft a project.
Conditions	The learner will be given • Instructions • Specifications • Drawings
Criteria	The learner will be evaluated on • Accuracy • Procedure

Line (GAC): C ORGANIZE WORK

Competency: C4 Perform layout of cabinets, furniture, and architectural millwork

Objectives

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

- Produce a cutting bill
- Produce a cutting plan

LEARNING TASKS	CONTENT
1. Produce a cutting bill	• Part number • Pieces • Thickness of material • Width • Length • Description • Material • Detail
2. Produce a cutting plan	• Stock sizes • Saw kerf • Factory edge allowance • Desired grain direction

Achievement Criteria

Performance	The learner will produce a drawing with a cutting bill/plan.
Conditions	The learner will be given • Instructions • Procedures • Materials
Criteria	The learner will be evaluated on • Safety • Accuracy • Procedure

Line (GAC): D PERFORM ROUTINE WORK PRACTICES

Competency: D2 Fabricate jigs and templates

Objectives

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

- Describe templates
- Describe jigs
- Fabricate jigs and templates

LEARNING TASKS	CONTENT

1. Describe templates	• Safety
	• Tools and equipment
	• Material
	  ○ Template material
	  ○ Stainless steel
	  ○ Glass
	  ○ Leather
	• Onsite templates
	  ○ Full size
	  ○ Modified full size
	  ○ Environmental conditions
	  ○ Site accessibility
	• Templates from specifications
	  ○ From drawings
	• Storage
	  ○ Reusabilty considerations

2. Describe jigs	• Safety
	• Tools and equipment
	  ○ Router
	  ○ Table saw
	• Accuracy
	  ○ Labelling
	• Material
	  ○ Durability
	  ○ Suitability
	  ○ Cost
	• Storage
	  ○ Reusabilty considerations

3. Fabricate jigs and templates	• Safety

LEARNING TASKS

CONTENT

- Planning of fabrication
  - Selecting tools and equipment
  - Selecting materials
  - Efficiency
  - Time management
  - Storage
- Fabricating a sample
  - Accuracy
  - Quality
  - Cost
- Selecting material
- Testing jig and template

Achievement Criteria

Performance	The learner will make a jig.
Conditions	The learner will be given • Instructions • Procedures • Materials • Equipment
Criteria	The learner will be evaluated on • Safety • Accuracy • Procedure • Functionality • Durability

Line (GAC): D PERFORM ROUTINE WORK PRACTICES

Competency: D4 Select hardware

Objectives

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

- Describe hardware
- Perform hardware take off

LEARNING TASKS	CONTENT

1. Describe hardware	• Types
	• Doors
	  ○ Hinges
	  ○ Soft close
	  ○ Pocket
	  ○ Sliding door
	• Drawers
	  ○ Under mount
	  ○ Side mount
	  ○ Soft close
	• Adjustable shelves
	• Cabinet locks
	  ○ Drawers
	  ○ Doors
	  ○ Glass
	• Pulls, handles, and knots
	• Specialty hardware
	  ○ Knock-down fittings
	  ○ Lazy susans
	• Current trends

2. Perform hardware take off	• Safety
	• Accuracy
	• Interpreting drawing
	• Specifications
	• Tallying hardware totals
	  ○ Software
	  ▪ Excel

Achievement Criteria

Performance	The learner will perform a hardware take off.
Conditions	The learner will be given • Instructions • Procedures • Drawings • Specifications • Computer
Criteria	The learner will be evaluated on • Safety • Accuracy • Procedure

Line (GAC): I LAMINATE WOOD AND COMPOSITE MATERIALS

Competency: I1 Arrange materials for laminating

Objectives

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

- Identify materials for laminating
- Arrange materials for laminating

LEARNING TASKS	CONTENT

1. Identify materials for laminating	• Characteristics
	  ○ Porosity
	  ○ Density
	  ○ Grain structure
	• Material type
	  ○ Solid wood
	  ○ Composite materials
	  ▪ Solid surface
	  ▪ Plastics

2. Arrange materials for laminating	• Adhesive selection
	  ○ Moisture considerations
	  ○ Thermal setting
	• Grain direction
	  ○ Face grain
	  ○ End grain
	• Inspecting for defects
	  ○ Knots
	  ○ Mineral streaks
	  ○ Insect damage
	  ○ Colour
	• Laminating sequence
	• Multiple laminations
	  ○ Matching
	• Laminating with joints
	  ○ Biscuit
	  ○ Finger
	  ○ Tongue and groove
	• Finishing application
	  ○ Opaque vs. transparent

Achievement Criteria

NOTE: GAC I will be assessed together in Competency I3.

Line (GAC): I LAMINATE WOOD AND COMPOSITE MATERIALS

Competency: I2 Apply adhesive for laminating

Objectives

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

- Identify tools and equipment
- Apply adhesive to materials for lamination
- Laminate multiple panels to make assemblies

LEARNING TASKS	CONTENT

1. Identify tools and equipment	• Safety
	  ○ Ventilation
	• Tools and equipment
	  ○ Rollers
	  ○ Brushes
	  ○ Rags
	  ○ Roller spreader
	• Environmental conditions
	  ○ Temperature
	  ○ Humidity

2. Apply adhesive to materials for lamination	• Adhesive selection
	  ○ Moisture considerations
	  ○ Thermal setting
	• Open time
	• Close time
	• Curing time
	• Determining application method
	• Spreading adhesive

3. Laminate multiple panels to make assemblies	• Considerations
	  ○ Glue thickness
	  ○ Width of each lamination
	  ○ Panel size
	• Joints
	  ○ Mitre
	  ○ Butt
	  ○ Rabbet/rebate

Achievement Criteria

NOTE: GAC I will be assessed together in Competency I3.

Line (GAC): I LAMINATE WOOD AND COMPOSITE MATERIALS

Competency: I3 Clamp pieces together

Objectives

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

- Describe power, pneumatic, and hydraulic clamps
- Clamp material together for multiple laminations

LEARNING TASKS	CONTENT

1. Describe power, pneumatic, and hydraulic clamps	• Safety
	• Selection
	• Types
	  ○ Hot press
	  ○ Cold press
	  ○ Vacuum press
	• Equipment protection
	  ○ Plastic coating
	  ○ Paper
	• Maintenance

2. Clamp material together for multiple laminations	• Clamping pressure • Alignment • Edge protection • Removing excess glue and squeeze-out • Physical space and storage • Removing clamps

Achievement Criteria

NOTE:	GAC I will be assessed together in this Achievement Criteria.
Performance	The learner will perform **multiple** laminations for a project.
Conditions	The learner will be given • Instructions • Procedures • Materials • Equipment
Criteria	The learner will be evaluated on • Safety • Accuracy • Procedure

Line (GAC): K APPLY LAMINATE SHEETS

Competency: K1 Select laminate sheets

Objectives

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

- Identify types of plastic laminates
- Apply handling and storage techniques

LEARNING TASKS	CONTENT

1. Identify types of plastic laminates	• Safety
	• Considerations
	  ○ Handling
	  ○ Storage
	  ○ Grain direction
	  ○ Finish
	• Thickness
	  ○ General purpose
	  ○ Post form
	  ○ Solid core
	  ○ Specialty
	• Grades
	  ○ Horizontal
	  ○ Vertical
	  ○ Backer
	  ○ Fire-retardant
	  ○ Commercial
	  ○ Laboratory
	  ○ Bending
	  ○ Specialty
	  ○ Liner
	• Size

2. Apply complex laminate techniques	• Shapes • Geometrical math • Size
3. Apply handling and storage techniques	• Positioning • Moving • Humidity • Edges • Contamination • Support

LEARNING TASKS	CONTENT

	• Accessibility
	• Inventory
	• Inspecting
	  ○ Defect
	  ○ Damage

Achievement Criteria

NOTE: GAC K will be assessed together in the Achievement Criteria for K4.

Line (GAC): K APPLY LAMINATE SHEETS

Competency: K2 Prepare laminate sheets and substrate

Objectives

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

- Describe selection of substrate materials
- Describe preparation of plastic laminate
- Prepare laminate sheets

LEARNING TASKS	CONTENT

1. Describe selection of substrate materials	• Types
	  ○ MDF
	  ○ Particle board
	  ○ Plywood
	• Advantages
	• Disadvantages
	• Preparing the core

2. Describe preparation of plastic laminate	• Checks before applicaion
	  ○ Temperature
	  ○ Humidity
	  ○ Cleanliness
	  ○ Grain/pattern direction
	  ○ Time constraints
	  ○ Equipment check
	  ○ Sequence
	• Irregular shapes
	  ○ Shapes
	  ○ Geometrical math

3. Prepare laminate sheets	• Safety • Tools and equipment • Cutting laminate sheets to size • Handling laminate sheets • Joining laminate edges • Cutting substrate

Achievement Criteria

NOTE: GAC K will be assessed together in the Achievement Criteria for K4.

Line (GAC): K APPLY LAMINATE SHEETS

Competency: K3 Adhere laminate sheets to substrate

Objectives

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

- Select adhesives
- Apply plastic laminate to substrate

LEARNING TASKS	CONTENT

1. Select adhesives	• Safety
	  ○ Hazards
	  ○ PPE
	  ○ SDS
	• Tools and equipment
	  ○ Roller
	  ○ Brush
	  ○ Spreader
	  ○ Sprayer
	  ○ Paint tray
	  ○ Buckets
	• Considerations
	  ○ Temperature
	  ○ Humidity
	  ○ Time constraints
	  ○ Visibility
	  ○ Gap filling qualities
	• Types
	  ○ Waterproof
	  ○ Polyvinyl Acetate (PVA)
	  ○ Epoxy
	  ○ Thermal setting

2. Apply plastic laminate to substrate	• Checks before application
	  ○ Temperature
	  ○ Humidity
	  ○ Cleanliness
	  ○ Grain/pattern direction
	  ○ Time constraints
	  ○ Equipment check
	  ○ Sequence
	• Adhesive application
	• Applying to core

LEARNING TASKS	CONTENT
	○ Position ○ Pressure application ▪ Hand press ▪ Pneumatic press ▪ Hydraulic press • Drying time • Tight and flush seam

Achievement Criteria

NOTE: GAC K will be assessed together in the Achievement Criteria for K4.

Line (GAC): K APPLY LAMINATE SHEETS

Competency: K4 Perform final clean-up of laminated sheets

Objectives

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

- Describe final clean-up of laminated panel
- Perform final clean-up of laminated panel

LEARNING TASKS	CONTENT

1. Describe final clean-up of laminated panel	• Considerations
	  ○ Radius inside corners
	  ○ Curved

2. Perform final clean-up of laminated panel	• Safety
	• Tools and equipment
	  ○ Trim router
	  ○ Edge bander
	  ○ File
	  ○ Sandpaper
	• Sequence
	  ○ Trim
	  ○ Bevel
	  ○ File
	  ○ Clean
	  ▪ Excess adhesive

Achievement Criteria

NOTE:	GAC K will be assessed together in this Achievement Criteria.
Performance	The learner will apply laminate sheet to substrate and perform final clean-up to edge treatment.
Conditions	The learner will be given • Instructions • Procedures • Materials • Equipment
Criteria	The learner will be evaluated on • Safety • Accuracy • Procedure

Line (GAC): L ASSEMBLE CABINETS AND FURNITURE

Competency: L1 Assemble cabinet components

Objectives

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

- Prepare assembly space
- Identify cabinet components
- Select cabinet components
- Describe subassembly components
- Apply assembly procedures for a cabinet with multiple openings

LEARNING TASKS	CONTENT

1. Prepare assembly space	• Tools and equipment
	  ○ Assembly platform
	  ○ Sighting boards
	  ○ Corner-to-corner measuring rods
	  ○ Tape measure
	  ○ Strongbacks
	  ○ Clamps
	• Adhesive selection
	• Crown bearers
	• Fasteners
	• Drawing and cut list
	• Pre-finishing

2. Identify cabinet components	• Gables
	• Tops
	• Bottoms
	• Doors
	• Backs
	• Drawer faces
	• Hardware
	  ○ Fasteners
	  ○ Hinges
	  ▪ Concealed
	  ▪ Butt
	  ▪ Piano
	  ▪ Pivot
	  ○ Soft-closing
	  ○ Locks
	  ○ Pulls

LEARNING TASKS	CONTENT
	○ Integrated slides ○ Full-extension slides • Detail machining ○ 32 mm drilling system ○ Joint types
3. Select cabinet components	• Considerations ○ Joints ○ Size ○ Finish • Hardware ○ Knock down ○ Fixed
4. Describe subassembly components	• Subassembly components ○ Drawer boxes ○ Base frame/toe-kick ○ Face frame
5. Apply assembly procedures for a cabinet with multiple openings	• Considerations ○ Drawer division ○ Centre gable ○ Adjustable shelves ○ Division • Checking material ○ Size ○ Type • Dry fit ○ Checking sequence ○ Organizing parts ○ Clamping • Applying adhesive ○ Types • Clamping/fastening • Checking for square/twist • Cleaning • Labelleing • Joining sub-assembly to cabinet components

Achievement Criteria

NOTE:	GAC L will be assessed together in this Achievement Criteria.
Performance	The learner will assemble a cabinet with multiple openings.
Conditions	The learner will be given • Instructions • Procedures • Materials • Equipment
Criteria	The learner will be evaluated on • Safety • Accuracy • Procedure

Line (GAC): L ASSEMBLE CABINETS AND FURNITURE

Competency: L2 Assemble furniture components

Objectives

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

- Prepare assembly space
- Identify furniture components
- Select furniture components
- Describe subassembly components
- Apply complex furniture assembly procedures

LEARNING TASKS	CONTENT

1. Prepare assembly space	• Tools and equipment
	  ○ Assembly platform
	  ○ Sighting boards
	  ○ Corner-to-corner measuring rods
	  ○ Tape measure
	  ○ Strongbacks
	  ○ Clamps
	• Adhesive selection
	• Crown bearers
	• Fasteners
	• Drawing and cut list
	• Pre-finishing

2. Identify furniture components	• Rails
	• Arms
	• Legs
	• Aprons
	• Backs
	• Tops
	• Bottoms
	• Hardware
	  ○ Fasteners
	  ○ Hinges
	  ▪ Concealed
	  ▪ Butt
	  ▪ Piano
	  ▪ Pivot
	  ▪ Leaf
	  ○ Soft-closing
	  ○ Locks
	  ○ Pulls
	  ○ Integrated slides

LEARNING TASKS	CONTENT
	○ Full-extension slides • Plinth
3. Select furniture components	• Considerations ○ Joints ○ Size ○ Finish ○ Expansion and contractions • Hardware ○ Slotted hardware for expansion and contraction ○ Decorative
4. Describe subassembly components	• Subassembly components ○ Table pedestal ○ Base frame/toe-kick
5. Apply complex furniture assembly procedures	• Considerations ○ Multiple components ○ Drawers ○ Doors ○ Hardware • Checking material ○ Size ○ Type • Detailing machining ○ Joint types ○ Profiles • Dry fit ○ Checking sequence ○ Organizing parts ○ Clamping • Applying adhesive ○ Types • Clamping/fastening • Checking for square/twist • Cleaning • Labelling • Joining sub-assembly to furniture components

Achievement Criteria

NOTE: GAC L will be assessed together in Achievement Criteria L1.

Line (GAC): L ASSEMBLE CABINETS AND FURNITURE

Competency: L3 Combine cabinet and furniture components into final assemblies

Objectives

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

- Apply final assembly techniques

LEARNING TASKS	CONTENT

1. Apply final assembly techniques	• Safety
	• Tools and equipment
	• Considerations
	  ○ Hardware placement does not impede operation
	  ○ Trends
	  ▪ Leather
	  ▪ Fur
	  ▪ Rustic
	  ▪ Wire brushing
	• Combining components
	  ○ Face frame
	  ○ Web frame
	  ○ Base/toe kick
	  ○ Drawers/doors
	  ○ Glass
	• Installing hardware
	  ○ Specialty
	  ○ Decorative
	• Applying decorative moulding and edging

Achievement Criteria

NOTE: GAC L will be assessed together in Achievement Criteria L1.

Line (GAC): O FINISH WOOD PRODUCTS

Competency: O1 Prepare finishing materials

Objectives

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

- Describe finishing materials
- Describe factors influencing finish selection
- Prepare finishing materials

LEARNING TASKS	CONTENT

1. Describe finishing materials	• Safety
	  ○ Hazards
	  ○ PPE
	  ○ Storage
	  ○ Expiration
	• Considerations
	  ○ Sheen
	  ○ Dry time
	  ○ Ventilation
	  ○ Environmental
	  ○ Disposal
	• Stains
	  ○ Water
	  ○ Latex
	  ○ Oil
	  ○ Non-grain-raising (NGR)
	  ○ Spirit stains
	• Bleaches
	• Sealers
	  ○ Lacquer sanding
	  ○ Pigmented primer
	  ○ Oil-based
	  ○ Water-based
	  ○ Solvent-based
	• Paste fillers
	• Top coats
	• Varnish
	  ○ Oleoresinous
	  ○ Conversion
	• Lacquer
	  ○ Pre-catalyzed
	  ○ Post-catalyzed

LEARNING TASKS	CONTENT
	○ Water-borne • Polyesters • Polyurethane • Paints and enamels • Oil • Wax
2. Describe factors influencing finish selection	• Additives • Tone and figure • Environmental factors • Application • End use • Application equipment • Toxicity • Cost • Time
3. Prepare finishing materials	• Measuring • Mixing • Filtering finishing products • Testing/adjusting finishing materials

Achievement Criteria

NOTE: Competency O1 will be assessed in Achievement Criteria O2 and O3.

Line (GAC): O FINISH WOOD PRODUCTS

Competency: O2 Apply finishing material manually

Objectives

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

- Describe manual finishing
- Apply finishing material manually

LEARNING TASKS	CONTENT

1. Describe manual finishing	• Safety
	  ○ PPE
	  ○ Hazards
	  ○ Ventilation
	• Tools and Equipment
	  ○ Rags
	  ○ Brushes
	  ○ Rollers
	  ○ Stain applicators
	• Considerations
	  ○ Number of coats
	  ○ Sheen
	  ○ Durability
	  ○ Environmental conditions
	  ○ Volatile Organic Compounds (VOCs)

2. Apply finishing material manually	• Procedure
	  ○ Set up area for applying and drying
	  ○ Use tools to apply finishing material
	  ○ Consistent wiping pattern
	  ○ Proper drying time
	• Quality control
	  ○ Sheen
	  ○ Colour
	  ○ Smoothness

Achievement Criteria

NOTE:	Include Competency O1 in this Achievement Criteria.
Performance	The learner will stain a flat panel manually.
Conditions	The learner will be given • Instructions • Procedures • Materials • Equipment
Criteria	The learner will be evaluated on • Safety • Accuracy • Procedure

Line (GAC): O FINISH WOOD PRODUCTS

Competency: O3 Spray on finishing materials

Objectives

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

- Describe spray finishing equipment
- Describe quality control
- Apply solvent-based finishing

LEARNING TASKS	CONTENT

1. Describe spray finishing equipment	• Safety
	  ○ PPE
	  ○ Ventilation
	  ○ Storage
	  ○ SDS
	  ○ Spill managemet plan
	• Tools and equipment
	  ○ Spray booth
	  ▪ Open face
	  ▪ Downdraft
	  ▪ Air makeup
	  ○ Pumps
	  ○ Airless
	  ○ Air assisted
	• Spray guns
	  ○ High Volume Low Pressure (HVLP)
	  ○ Gravity feed
	  ○ Siphon feed
	  ○ Airless
	  ○ Air-assist
	• Air supply system
	  ○ Components
	  ○ Troubleshooting

2. Describe quality control	• Sheen
	• Colour
	• Smoothness
	• Number of coats
	• Thickness of coats
	• Spray defects
	  ○ Types
	  ▪ Tiger striping
	  ▪ Orange peel
	  ▪ Cratering

LEARNING TASKS	CONTENT
	▪ Fisheye ▪ Pin holes ▪ Runs ○ Remedies
3. Apply finishing procedures	• Manufacturer's specifications • Setup gun atomization rate • Feed rate • Proximity/distance between gun and material • Techniques ○ Gun grip ○ Overlap ○ Sequence ○ Polishing/buffing a finished surface • Product ○ Sealers ○ Primers ○ Clear • Problems ○ Overspray ○ Gun spitting/clogging • Quality control ○ Colour ○ Fill ○ Consistency ○ Sheen ○ Check for defects • Cleaning up

Achievement Criteria

NOTE:	Include Competency O1 in this Achievement Criteria.
Performance	The learner will spray a flat panel with a solvent-based transparent finish.
Conditions	The learner will be given • Instructions • Procedures • Materials • Equipment
Criteria	The learner will be evaluated on • Safety • Accuracy • Procedure

Line (GAC): P MODIFY PRODUCTS TO SITE CONDITIONS

Competency: P1 Cut access holes on site

Objectives

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

- Describe considerations for access holes
- Describe cutting access holes on site

LEARNING TASKS	CONTENT

1. Describe considerations for access holes	• Safety
	  ○ Confined spaces
	  ○ PPE
	  ○ Asbestos
	  ○ Utility location
	  ○ Engineering
	• Tools and Equipment
	  ○ Hole saw
	  ○ Power drill
	• Interpreting drawings/specifications
	• Coordinating with other trades
	• Function of access holes

2. Describe cutting access holes on site	• Procedure
	  ○ Determining reference point for locating access holes
	  ○ Creating holes
	  ○ Painting and sealing access points

Line (GAC): P MODIFY PRODUCTS TO SITE CONDITIONS

Competency: P2 Scribe products to fit on site

Objectives

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

- Describe considerations for scribing products to fit on site
- Scribe products to fit on site

LEARNING TASKS	CONTENT

1. Describe considerations for scribing products to fit on site	• Safety
	  ○ PPE
	  ○ Dust control plan
	• Tools and equipment
	  ○ Belt sander
	  ○ Edge sander
	  ○ Jigsaw
	  ○ Scribers
	  ○ Geometry compass
	  ○ Pencil
	• Workspace conditions
	• Untrue wall, ceiling, and floor surfaces
	• Template creation

2. Scribe products to fit on site	• Selecting and using tools and equipment • Setting products in place • Marking profile of surface • Modifying profile • Cleaning up workspace and finished products ○ Protecting surface of product

Achievement Criteria

Performance	The learner will scribe product to suit installation requirements.
Conditions	The learner will be given • Instructions • Procedures • Materials • Equipment
Criteria	The learner will be evaluated on • Safety • Accuracy • Procedure

Line (GAC): Q INSTALL CABINETS AND COUNTERTOPS

Competency: Q1 Perform final on-site assembly and fastening of cabinets and countertops

Objectives

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

- Describe the installation of cabinets and countertops.
- Install cabinets and countertops on site

LEARNING TASKS

1. Describe the installation of cabinets and countertops

CONTENT

- Considerations
  - Seismic considerations
  - Specifications, codes, and regional regulations
- Site survey
  - Structural component location
- Site readiness
  - Heat
  - Humidity
  - Backing
  - Building access
  - Elevator
  - Coordination with other trades
- Receiving millwork
  - Shipping list
  - Delivering to area/room
- Reviewing drawings
- Materials
  - Natural
    - Granite
    - Quartz
    - Marble
    - Wood
  - Synthetic
    - Concrete
    - Plastic laminate
    - Solid surface
    - Acrylic
- Hardware placement
  - Aesthetics
  - Quality

LEARNING TASKS

2. Install cabinets and countertops on site

CONTENT

- Safety
- Tools and equipment
- Adhesives
- Layout
  - Floor and ceiling level
  - Walls are plumb
  - Products within the room
  - Installation sequence
- Installing
  - Modifying cabinets
  - Site assembly
  - Levelling
  - Fastening
  - Trimming components
  - Final adjustment
- Cleaning up
  - Protection
  - Removing waste material

Achievement Criteria

Performance	The learner will install lower cabinets with countertops, scribed to the wall including a toe kick.
Conditions	The learner will be given • Instructions • Procedures • Materials • Equipment
Criteria	The learner will be evaluated on • Safety • Accuracy • Procedure

Line (GAC): Q INSTALL CABINETS AND COUNTERTOPS

Competency: Q2 Finalize installation of cabinets and countertops

Objectives

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

- Finalize installation of cabinets and countertops

LEARNING TASKS	CONTENT

1. Finalize installation of cabinets and countertops	• Safety
	• Tools and equipment
	  ○ Caulking gun
	  ○ Screw drivers
	  ○ Packaging material
	  ○ Vacuums
	• Hardware
	  ○ Knobs
	  ○ Pulls
	  ○ Decorative
	• Repairing imperfections
	  ○ Dents
	  ○ Scratches
	• Sealing cut-outs
	• Applying caulking and silicone to back splash and trim
	• Adjustments
	• Cleaning cabinets, countertops, and worksite

Level 3

Cabinetmaker

Line (GAC): B USE TOOLS AND EQUIPMENT

Competency: B3 Maintain automated and CNC equipment

Objectives

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

- Describe automated equipment
- Describe CNC equipment
- Perform maintenance on basic CNC and automated equipment

LEARNING TASKS	CONTENT

1. Describe automated equipment	• Safety
	• Types
	  ○ Edge-banding machines
	  ▪ Feed methods
	  – Manual
	  – Automatic
	  ○ Multiple ripsaw
	  ○ Moulder
	  ▪ Multi-head shaper
	  ○ Profile grinder
	  ○ Double-end tenoner
	  ○ Through-feed
	• Adjustments
	• Drive systems

2. Describe CNC equipment	• Safety
	• Machine types
	  ○ CNC router
	  ○ CNC beam saw
	  ○ CNC machining centre
	  ○ CNC moulder
	• Types
	  ○ Pod and rail
	  ○ Flat table/nesting table
	  ○ Gantry
	• Parts
	  ○ Blades
	  ○ Bits
	  ○ Cutters

3. Perform maintenance on basic CNC and automated equipment	• Safety ○ PPE

LEARNING TASKS

CONTENT

- Lockout and tagout procedures
- Automatic emergency stop systems
  - Equipment specific
- Types of basic equipment
  - Shaper
  - Edge bander
  - Point-to-point
- Visual inspection
  - Signs of damage
  - Cleanliness
  - Frayed cords
- Cleaning and lubricating equipment
- Dust collection system
  - Tight
  - No leaks
- Worn, dull, and damaged equipment
  - Poor cutting
  - Burning
  - Inaccurate cuts
- Guards
  - Functional
  - Placement

Achievement Criteria

Performance	The learner will complete a maintenance assessment
Conditions	The learner will be given • Maintenance assessment checklist • Equipment • PPE
Criteria	The learner will be evaluated on • Safety • Accuracy

Line (GAC): B USE TOOLS AND EQUIPMENT

Competency: B4 Maintain finishing equipment

Objectives

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

- Describe finishing equipment
- Describe safety procedures for maintenance of finishing equipment
- Describe maintenance of finishing equipment

LEARNING TASKS	CONTENT

1. Describe finishing equipment	• Safety
	• Brushes
	• Spray booth
	• Downdraft
	• Pumps
	  ○ Airless
	  ○ Air-assisted
	  ○ High Volume Low Pressure (HVLP)
	  ○ Pressure pot
	• Guns
	  ○ Gravity feed
	  ○ Siphon feed
	  ○ Bladder
	  ○ Air brush
	• Air supply system
	  ○ Components
	  ○ Troubleshooting
	• Mixing and measuring

2. Describe safety procedures for maintenance of finishing equipment	• Lockout and tagout procedures
	• PPE
	• Health hazards
	• Storage
	  ○ Rags
	  ○ Chemical
	  ▪ Unused
	  ▪ Used
	  ▪ Excess chemicals
	  ▪ Disposal
	  ○ Finishing equipment
	• Ventilation

LEARNING TASKS	CONTENT

3. Describe maintenance of finishing equipment	• Cleaning
	• Lubricating
	• Lighting
	  ○ Daylight
	  ○ LED
	  ○ Halogen
	  ○ Lumens
	• Worn and damaged components
	  ○ Replacement
	  ○ Tips
	  ○ Air lines
	  ○ Change filters
	• Ventilation

Line (GAC): D PERFORM ROUTINE WORK PRACTICES

Competency: D2 Fabricate jigs and templates

Objectives

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

- Fabricate curved jigs and templates

LEARNING TASKS	CONTENT

1. Describe curved templates and jigs	• Safety
	• Tools and equipment
	  ○ Shaper
	  ○ Overhead router
	• Lead in and lead out requirements
	• Hold down methods

2. Fabricate curved jigs and templates	• Safety
	• Tools and equipment
	  ○ CNC
	  ○ Shaper
	  ○ Overhead router
	• Shape types
	  ○ Ellipse
	  ○ Radius/diameter
	  ○ Spline
	• Planning fabrication
	  ○ Selecting tools and equipment
	  ○ Selecting materials
	  ○ Efficiency
	  ○ Time management
	  ○ Storage
	• Fabricating sample
	  ○ Accuracy
	  ○ Quality
	  ○ Cost
	• Selecting material
	• Testing jig and template

Achievement Criteria

Performance	The learner will fabricate a jig from a template using the shaper or overhead router.
Conditions	The learner will be given • PPE • Tools and equipment • Specifications • Materials
Criteria	The learner will be evaluated on • Safety • Accuracy • Reproducibility • Durability

Line (GAC): D PERFORM ROUTINE WORK PRACTICES

Competency: D3 Build prototypes

Objectives

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

- Build prototypes

LEARNING TASKS	CONTENT

1. Describe prototypes	• Safety
	• Tools and Equipment
	• Types
	  ○ Basic
	  ○ Complex
	• Purpose
	  ○ Design
	  ○ Materials
	  ○ Cost
	  ○ Testing functionality
	  ○ Fabrication procedure and methods
	  ▪ Identifying potential construction challenges
	• Accuracy
	• Scale
	• Durability

2. Build prototypes	• Layout
	  ○ Drawings
	  ○ Specifications
	• Material selection
	  ○ Hardware
	  ○ Solid
	  ○ Sheet goods
	  ○ Veneer
	  ○ Composite
	• Fabrication process
	• Testing procedure

Line (GAC): G MACHINE COMPONENTS USING AUTOMATED AND CNC EQUIPMENT

Competency: G1 Set up automated and CNC equipment

Objectives

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

- Describe CNC equipment
- Set up CNC equipment for basic operations
- Describe automated equipment
- Set up of automated equipment

LEARNING TASKS	CONTENT

1. Describe CNC equipment	• Purpose
	• Types
	  ○ Pod and rail system
	  ○ Nesting table/flat table
	  ○ Gantry
	• Parts
	• Accessories
	  ○ Loaders
	  ○ Conveyor systems
	  ○ Tools
	  ○ Software
	• Chip load/feed rate

2. Set up CNC equipment for basic operations	• Safety
	• Calibrating equipment and tooling
	• Tooling types
	  ○ Router bits
	  ○ Saw blades
	  ○ Drill bits
	• Selecting and installing tooling
	• Selecting software
	  ○ Optimization
	  ○ Computer Aided Manufacturing (CAM)
	  ○ Manual input
	• Programming CNC equipment according to software specifications
	• Running simulator

3. Describe automated equipment	• Purpose

LEARNING TASKS	CONTENT

	• Types
	  ○ Spray lines
	  ○ Conveyor systems
	  ○ Veneer presses
	  ○ Dovetailer
	  ○ Wide belt sander
	• Parts
	• Accessories
	• Chip load/feed rate

4. Set up of automated equipment	• Safety • Identifying equipment type • Tooling types • Selecting and installing tooling • Calibrating equipment and tooling • Setting up machine acccording to manufacturers' procedures • Running test piece/sample

Achievement Criteria

Performance	The learner will create a basic CNC program.
Conditions	The learner will be given • Instructions • Tools • Equipment • Materials
Criteria	The learner will be evaluated on • Accuracy • Time management • Efficiency

Line (GAC): G MACHINE COMPONENTS USING AUTOMATED AND CNC EQUIPMENT

Competency: G2 Operate automated and CNC equipment

Objectives

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

- Operate CNC equipment for basic operations
- Operate automated equipment

LEARNING TASKS	CONTENT

1. Operate CNC equipment for basic operations	• Safety
	• Applications
	• Types
	• Material inspection
	  ○ Flaws and defects
	  ○ Grading
	• Operation procedures
	  ○ Visual machine inspection
	  ○ Initial start up
	  ○ Calibration
	  ○ Load/unload materials
	  ○ Executing program

2. Operate automated equipment	• Safety
	• Applications
	• Types
	  ○ Spray lines
	  ○ Conveyor systems
	  ○ Veneer presses
	  ○ Dovetailer
	  ○ Wide belt sander
	• Material inspection
	  ○ Flaws and defects
	  ○ Grading
	• Operation procedures
	  ○ Visual machine inspection
	  ○ Initial start up
	  ○ Calibration
	  ○ Loading/unloading materials

Achievement Criteria

Performance	The learner will use automated equipment.
Conditions	The learner will be given • PPE • Instructions • Tools and equipment • Materials
Criteria	The learner will be evaluated on • Safety • Accuracy • Finished product • Time management • Cleanliness

Line (GAC): H CREATE CURVED COMPONENTS USING WOOD AND COMPOSITE MATERIALS

Competency: H1 Build forms

Objectives

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

- Describe forms
- Build a form by hand

LEARNING TASKS	CONTENT

1. Describe forms	• Types
	  ○ Postive/convex/male
	  ○ Negative/concave/female
	  ○ Slab form
	  ○ Hollow frame
	• Purpose
	  ○ Hold accurate shape
	  ○ Reproducable
	  ○ Single-use
	  ○ Can be used as a jig to size components
	• Materials
	  ○ Medium-density fibreboard (MDF)
	  ○ Rubber ply
	  ○ Plywood
	• Considerations
	  ○ Oversize panel
	  ○ Adhesives
	  ○ Fasteners
	  ○ Pressure required
	  ○ Temperature
	  ○ Humidity
	  ○ Release agents
	  ▪ Wax
	  ▪ Laminate
	  ▪ Tape

2. Build a form by hand	• Safety
	• Tools and equipment
	  ○ Trammel points
	  ○ Router
	  ○ Shaper
	  ○ Table saw

LEARNING TASKS	CONTENT
	○ Press ○ Screw guns • Procedure ○ Laying out shape ○ "Router on a stick" ○ Creating master template ○ Creating jigs and forms

Achievement Criteria

Performance	The learner will use a shaper to create a form for curved components.
Conditions	The learner will be given • PPE • Materials • Instructions • Tools and equipment
Criteria	The learner will be evaluated on • Safety • Accuracy • Time management

Line (GAC): H CREATE CURVED COMPONENTS USING WOOD AND COMPOSITE MATERIALS

Competency: H2 Perform curved laminating

Objectives

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

- Laminate curved components

LEARNING TASKS

1. Laminate curved components

CONTENT

- Safety
- Tools and equipment
- Selecting materials
  - Solid wood
  - Sheet goods
  - Composite material
- Selecting form
- Selecting adhesives
  - Open time
  - Cure time
  - Thermal setting
  - Elasticity
  - Viscosity
  - Environmental considerations
    - Volatile Organic Compounds (VOCs)
    - Humidity
    - Temperature
- Selecting fasteners
  - Type
  - Holding power
  - Sheer strength
- Considerations
  - Grain orientation
  - Saw kerf
  - Marking
- Procedure
  - Cut material to specifications
  - Applying adhesives/fasteners
  - Placing material into form
  - Applying pressure
    - Clamps
    - Presses
    - Vacuum press

LEARNING TASKS	CONTENT
	○ Allowing curing time ○ Removing from form ○ Cutting to final size

Achievement Criteria

Performance	The learner will create a curved component.
Conditions	The learner will be given • PPE • Tools and equipment • Instructions • Materials
Criteria	The learner will be evaluated on • Safety • Accuracy • Procedure • Time management

Line (GAC): H CREATE CURVED COMPONENTS USING WOOD AND COMPOSITE MATERIALS

Competency: H3 Steam-form wood

Objectives

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

- Describe steam-forming wood
- Describe building a steam box
- Describe procedure for steam-forming wood

LEARNING TASKS	CONTENT

1. Describe steam-forming wood	• Safety
	• Tools and equipment
	  ○ Steam box
	  ○ Heating system to create steam
	  ○ Table saw
	  ○ Screw guns
	• Materials
	  ○ Plywood for steam box construction
	  ○ Solid wood
	  ○ Fasteners
	• Considerations
	  ○ Moisture content
	  ○ Calculating steaming time
	  ▪ Wood thickness
	  ○ Environmental considerations
	  ▪ Non-confined space
	  ▪ Ventilation

2. Describe building a steam box	• Measuring and cutting plywood to size • Applying fasteners and adhesives • Sealing box
3. Describe procedure for steam-forming wood	• Safety • Tools and equipment • Inserting a tube ○ PVC • Heating water to create steam • Placing wood in steam box • Allowing accurate steam time • Removing wood

LEARNING TASKS	CONTENT
	• Clamping steam-formed wood to a form immediately • Allowing to cure • Cutting to final size

Line (GAC): J APPLY VENEER

Competency: J1 Select veneers

Objectives

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

- Describe veneers
- Select veneer

LEARNING TASKS	CONTENT

1. Describe veneers	• Thin wood slices
	• Purpose
	  ○ Decorative
	  ○ Cost effectiveness
	  ○ Colour matching
	  ○ Grain matching
	• Species
	  ○ Hardwood
	  ○ Softwood
	  ○ Reconstituted

2. Select veneer	• Cuts
	  ○ Rotary
	  ○ Flat
	  ○ Rift
	  ○ Quarter
	  ○ Slip
	  ○ Book
	  ○ Random
	• Grades
	  ○ Hardwood
	  ▪ Front face AA-E
	  ▪ Back side 1-4
	  ○ Softwood
	  ▪ G2S
	  ▪ G1S
	• Defects
	  ○ Mineral stains
	  ○ Knots
	  ○ Insect damage
	  ○ Heartwood/sapwood
	• Quantity required
	  ○ Scope of project
	  ○ Flitch size

Achievement Criteria

NOTE: Competency J1 Select veneers will be assessed with all of J Line in competency J4 Perform final clean-up of laminated sheets.

Line (GAC): J APPLY VENEER

Competency: J2 Prepare veneer and substrate

Objectives

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

- Prepare veneer
- Prepare substrate

LEARNING TASKS	CONTENT

1. Prepare veneer	• Safety
	• Tools and equipment
	• Selecting veneer pattern
	  ○ Balance
	  ○ Centre
	  ○ Book
	  ○ Slip
	  ○ Random
	  ○ End
	  ○ Starburst
	  ○ Diamond
	  ○ Box
	• Calculating leaves to optimum widths
	• Softening veneer
	• Cutting and stitching veneer leaves
	  ○ Automated
	  ○ Manual
	  ○ Tape
	  ○ Stitchers
	• Repairing checks and splits
	• Storage
	  ○ Climate controlled environment
	  ○ Ultra Violet (UV) sensitive
	  ○ Handling
	  ○ Damage prevention techniques

2. Prepare substrate	• Safety
	• Types
	  ○ MDF
	  ○ Particle board
	  ○ Plywood
	• Edge treatment considerations
	  ○ Profile

LEARNING TASKS

CONTENT

- Types
  - 1, 2, 3
- Cutting substrate
- Sanding and calibrating substrate

Achievement Criteria

NOTE: Competency J2 Prepare veneer and substrate will be assessed with all of J Line in competency J4 Perform final clean-up of laminated sheets.

Line (GAC): J APPLY VENEER

Competency: J3 Adhere veneer to substrate

Objectives

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

- Describe considerations for adhering veneer to substrate
- Adhere single panel of veneer to substrate

LEARNING TASKS	CONTENT

1. Describe considerations for adhering veneer to substrate	• Tools and equipment
	  ○ Rollers
	  ○ Trays
	  ○ Brushes
	• Adhesives
	  ○ Urea-formaldehyde
	  ▪ Leadership in Energy and Environmental Design (LEED)
	  ○ Thermal setting
	  ○ Polyvinyl Acetate (PVA)
	  ▪ Cross link
	  ○ Water resistent/waterproof
	• Hazards
	  ○ Carcinogens
	  ○ Corrosive properties
	  ○ Vapours
	  ○ Ventilated
	  ○ Damage to final product

2. Adhere single panel of veneer to substrate	• Safety
	  ○ PPE
	  ○ Respirator
	• Procedure
	  ○ Selecting adhesives
	  ○ Applying adhesive to substrate
	  ○ Pressing veneer to panel
	  ▪ Homemade
	  ▪ Hot press
	  ▪ Cold press
	  ▪ Form
	  ○ Allowing for cure time
	  ○ Removing from press

Achievement Criteria

NOTE: Competency J3 Adhere veneer to substrate will be assessed with all of J Line in competency J4 Perform final clean-up of laminated sheets.

Line (GAC): J APPLY VENEER

Competency: J4 Perform final clean-up of laminated sheets

Objectives

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

- Perform final clean-up of laminated sheets for a single panel of veneer

LEARNING TASKS	CONTENT

1. Describe final clean-up of laminated sheets for a single panel of veneer	• Safety
	• Tools and equipment
	  ○ Veneer saw
	  ○ Table saw
	  ○ Router
	  ○ Edge trimmer
	  ○ Glue scraper
	• Considerations
	  ○ Protection of final product
	  ○ Veneer species
	  ○ Adhesive used
	  ○ Edge treatment

2. Perform final clean-up of laminated sheets for a single panel of veneer	• Removing excess glue
	• Scraping veneer tape
	• Trimming edges
	• Cutting to final size
	  ○ Types of joints
	  ▪ Mitered
	  ▪ Biscuit spline
	  ▪ Rebate
	• Sanding panel
	  ○ Grit
	  ○ Colour matching
	  ○ Finish requirements
	  ○ With grain
	  ○ Removing defects
	• Repairing damage
	  ○ Removing defects
	  ○ Ironing out dents
	  ○ Patches

Achievement Criteria

NOTE:	Achievement criteria in J4 will be used to assess all of J Line.
Performance	The learner will adhere veneer to a substrate that is: • Cut to final size • Defect-free • Ready for finishing
Conditions	The learner will be given • PPE • Tools and equipment • Instructions • Materials
Criteria	The learner will be evaluated on • Safety • Accuracy • Time management • Quality of sanding

Line (GAC): L ASSEMBLE CABINETS AND FURNITURE

Competency: L1 Assemble cabinet components

Objectives

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

- Prepare assembly space
- Select cabinet components
- Describe subassembly components
- Describe assembly procedures for curved cabinets

LEARNING TASKS	CONTENT

1. Prepare assembly space	• Tools and equipment
	  ○ Assembly platform
	  ○ Sighting boards
	  ○ Corner-to-corner measuring rods
	  ○ Tape measure
	  ○ Strongbacks
	  ○ Clamps
	• Adhesive selection
	• Crown bearers
	• Fasteners
	• Drawing and cut list
	• Pre-finishing

2. Identify cabinet components	• Gables
	• Tops
	• Bottoms
	• Doors
	• Backs
	• Drawer faces
	• Hardware
	  ○ Fasteners
	  ○ Hinges
	  ▪ Concealed
	  ▪ Butt
	  ▪ Piano
	  ▪ Pivot
	  ○ Soft-closing
	  ○ Locks
	  ○ Pulls
	  ○ Integrated slides
	  ○ Full-extension slides

LEARNING TASKS	CONTENT

	• Detail machining
	  ○ 32 mm drilling system
	  ○ Joint types

3. Select cabinet components	• Considerations
	  ○ Joints
	  ○ Size
	  ○ Finish
	• Hardware
	  ○ Knock down
	  ○ Fixed

4. Describe subassembly components	• Subassembly components
	  ○ Drawer boxes
	  ○ Base frame/toe-kick
	  ○ Face frame

5. Describe assembly procedures for curved cabinet	• Considerations
	  ○ Drawer division
	  ○ Centre gable
	  ○ Adjustable shelves
	  ○ Division
	• Checking material
	  ○ Size
	  ○ Type
	• Forms
	  ○ Protection
	  ○ Radius
	  ○ Accuracy
	  ○ Durability
	• Dry fit
	  ○ Check sequence
	  ○ Organize parts
	  ○ Clamp
	• Applying adhesive
	  ○ Types
	• Clamping/fastening
	• Checking for square/twist
	• Cleaning
	• Labelling
	• Joining sub-assembly to cabinet components

Line (GAC): L ASSEMBLE CABINETS AND FURNITURE

Competency: L2 Assemble furniture components

Objectives

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

- Prepare assembly space
- Select furniture components
- Describe subassembly components
- Describe curved furniture assembly procedures

LEARNING TASKS	CONTENT

1. Prepare assembly space	• Tools and equipment
	  ○ Assembly platform
	  ○ Sighting boards
	  ○ Corner-to-corner measuring rods
	  ○ Tape measure
	  ○ Strongbacks
	  ○ Clamps
	• Adhesive selection
	• Crown bearers
	• Fasteners
	• Drawing and cut list
	• Pre-finishing

2. Identify furniture components	• Rails
	• Arms
	• Legs
	• Aprons
	• Backs
	• Tops
	• Bottoms
	• Hardware
	  ○ Fasteners
	  ○ Hinges
	  ▪ Concealed
	  ▪ Butt
	  ▪ Piano
	  ▪ Pivot
	  ▪ Leaf
	  ○ Soft-closing
	  ○ Locks

LEARNING TASKS	CONTENT
	○ Pulls ○ Integrated slides ○ Full-extension slides • Plinth
3. Select furniture components	• Considerations ○ Joints ○ Size ○ Finish ○ Expansion and contraction • Hardware ○ Slotted hardware for expansion and contraction ○ Decorative
4. Describe subassembly components	• Subassembly components ○ Table pedestal ○ Base frame/toe-kick
5. Apply curved furniture assembly procedures	• Considerations ○ Multiple components ○ Drawers ○ Doors ○ Hardware • Forms ○ Protection ○ Radius ○ Accuracy ○ Durability • Checking material ○ Size ○ Type • Detailing machining ○ Joint types ○ Profiles • Dry fit ○ Checking sequence ○ Organizing parts ○ Clamping • Applying adhesive ○ Types • Clamping/fastening

LEARNING TASKS	CONTENT
	• Checking for square/twist • Cleaning • Labelling • Joining sub-assembly to furniture components

Line (GAC): L ASSEMBLE CABINETS AND FURNITURE

Competency: L3 Combine cabinet and furniture components into final assemblies

Objectives

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

- Describe curved final assembly techniques

LEARNING TASKS	CONTENT

1. Describe final assembly techniques for curved cabinets and furniture components	• Safety
	• Tools and equipment
	• Considerations
	  ○ Hardware placement does not impede operation
	  ○ Trends
	  ▪ Leather
	  ▪ Fur
	  ▪ Rustic
	  ▪ Wire brushing
	• Combining components
	  ○ Face frame
	  ○ Web frame
	  ○ Base/toe kick
	  ○ Drawers/doors
	  ○ Glass
	• Forms
	  ○ Protection
	  ○ Radius
	  ○ Accuracy
	  ○ Durability
	• Installing hardware
	  ○ Specialty
	  ○ Decorative
	• Applying decorative moulding and edging

Line (GAC): O FINISH WOOD PRODUCTS

Competency: O1 Prepare finishing materials

Objectives

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

- Describe finishing materials
- Describe factors influencing opaque/pigmented solvent-based finish selection
- Prepare finishing materials

LEARNING TASKS	CONTENT

1. Describe finishing materials	• Safety
	  ○ Hazards
	  ○ PPE
	  ○ Storage
	  ○ Expiration
	• Considerations
	  ○ Sheen
	  ○ Dry time
	  ○ Ventilation
	  ○ Environmental
	  ○ Disposal

2. Describe factors influencing opaque/pigmented solvent-based finish selection	• Additives
	  ○ Pigments
	  ○ Dyes
	  ○ Microtones
	• Equipment
	  ○ Spray
	  ○ Tip selection
	• Environmental factors
	• Tone and shade
	• Toxicity
	• Cost
	• Time

3. Prepare finishing materials	• Measuring • Mixing • Filtering debris from finishing materials • Testing/adjusting finishing materials

Achievement Criteria

NOTE: Competency O1 will be assessed in Achievement Criteria O2 and O3.

Line (GAC): O FINISH WOOD PRODUCTS

Competency: O2 Apply finishing material manually

Objectives

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

- Describe manual finishing
- Apply finish to colour match a sample

LEARNING TASKS	CONTENT

1. Describe manual finishing	• Safety
	  ○ PPE
	  ○ Hazards
	  ○ Ventilation
	• Tools and Equipment
	  ○ Rags
	  ○ Brushes
	  ○ Rollers
	  ○ Stain applicators
	• Considerations
	  ○ Number of coats
	  ○ Sheen
	  ○ Durability
	  ○ Environmental conditions
	  ○ Volatile Organic Compounds (VOCs)

2. Apply finish to colour match a sample	• Procedure
	  ○ Set up area for applying and drying
	  ○ Using tools to apply finishing material
	  ○ Consistent wiping pattern
	  ○ Proper drying time
	• Colour matching
	  ○ Restrictions
	  ▪ Total dye/pigment percentage
	  ▪ Complexity
	  ○ Pigment and dyes
	  ○ Consistency
	  ○ Stain base
	  ○ Measuring
	  ○ Mixing
	• Quality control
	  ○ Sheen

LEARNING TASKS	CONTENT
	○ Colour match ○ Smoothness

Achievement Criteria

NOTE:	Include Competency O1 in this Achievement Criteria.
Performance	The learner will colour match a wood sample.
Conditions	The learner will be given • Instructions • Procedures • Materials • Equipment
Criteria	The learner will be evaluated on • Safety • Accuracy • Procedure • Colour match

Line (GAC): O FINISH WOOD PRODUCTS

Competency: O3 Spray on finishing material

Objectives

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

- Describe spray finishing equipment
- Describe quality control
- Apply water-based finishing

LEARNING TASKS	CONTENT

1. Describe spray finishing equipment	• Safety
	  ○ PPE
	  ○ Ventilation
	  ○ Storage
	  ○ SDS
	  ○ Spill managemet plan
	• Tools and equipment
	  ○ Spray booth
	  ▪ Open face
	  ▪ Downdraft
	  ▪ Air makeup
	  ○ Pumps
	  ○ Airless
	  ○ Air assisted
	• Spray guns
	  ○ High Volume Low Pressure (HVLP)
	  ○ Gravity feed
	  ○ Siphon feed
	  ○ Airless
	  ○ Air-assist
	• Air supply system
	  ○ Components
	  ○ Troubleshooting

2. Describe quality control	• Sheen
	• Colour
	• Smoothness
	• Number of coats
	• Thickness of coats
	• Spray defects
	  ○ Types
	  ▪ Tiger striping

LEARNING TASKS	CONTENT
	▪ Orange peel ▪ Cratering ▪ Fisheye ▪ Pin holes ▪ Runs ○ Remedies
3. Apply water-based finishing	• Manufacturer's specifications • Setting up gun atomization rate • Feed rate • Proximity/distance between gun and material • Techniques ○ Gun grip ○ Overlap ○ Sequence ○ Polishing/buffing a finished surface • Product ○ Sealers ○ Top coat • Problems ○ Overspray ○ Gun spitting/clogging • Quality control ○ Colour ○ Fill ○ Consistency ○ Sheen ○ Checking for defects • Cleaning up ○ Speciality products ○ Disposal

Achievement Criteria

NOTE:	Include Competency O1 in this Achievement Criteria.
Performance	The learner will spray a project with water-based finish.
Conditions	The learner will be given • Instructions • Procedures • Materials • Equipment
Criteria	The learner will be evaluated on • Safety • Accuracy • Procedure

Line (GAC): S BUILD STAIRS AND BALUSTRADES

Competency: S1 Lay out stair and balustrade components

Objectives

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

- Define staircase terminology
- Describe staircase layout considerations
- Describe layout stairs

LEARNING TASKS	CONTENT
1. Define staircase terminology	• Balustrade • Birdsmouth • Kick plate • Line of flight • Nosing • Riser • Stringer • Stairwell opening • Tread • Volute

2. Describe staircase layout considerations	• Calculations
	  ○ Rise and run
	  ○ Stringer length
	  ○ Head room
	  ○ Circumference
	  ○ Pythagoras theorum
	• Specifications
	• Building Codes
	• Staircase configurations
	  ○ Straight
	  ○ Geometric/circular
	• Site considerations
	  ○ Onsite vs. in shop sequence of assembly

3. Describe layout stairs	• Safety
	• Tools and equipment
	• Procedure
	  ○ Verifying stairwell dimensions
	  ○ Calculating rise/run ratio

LEARNING TASKS	CONTENT
	○ Calculating radius and spacing of balustrades ○ Preparing full scale stair layouts ○ Identifying location of stair components ▪ Placement ▪ Hanging attachments

Line (GAC): S BUILD STAIRS AND BALUSTRADES

Competency: S2 Machine stair and balustrade components

Objectives

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

- Describe machining stair components
- Describe machining stair component procedure

LEARNING TASKS	CONTENT

1. Describe machining stair components	• Safety
	• Tools and equipment
	  ○ CNC equipment
	  ○ Skill saw
	• Types
	  ○ Balusters
	  ○ Stringers
	  ○ Risers
	  ○ Treads
	  ○ Hand rails
	  ○ Newel posts
	• Wood properties
	  ○ Optimizing grain direction
	  ▪ Creaking
	  ▪ Expansion issues
	  ○ Strength
	  ○ Cut
	  ▪ Quarter cut
	  ▪ Flat cut
	• Species
	  ○ Hardwood vs. softwood
	  ○ Availability
	  ○ Cost effective
	  ○ Decorative
	  ○ Toxicity

2. Describe machining stair component procedure	• Select tools and equipment
	  ○ CNC
	  ○ Shaper
	  ○ Hand tools
	• Select joint types
	  ○ Dowels
	  ○ Mortise and tenon
	  ○ Rabbets and dadoes
	  ○ Lock mitre
	• Verifying dimensions
	• Machinng components

Line (GAC): S BUILD STAIRS AND BALUSTRADES

Competency: S3 Assemble stairs and balustrades

Objectives

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

- Describe stair and balustrade assembly

LEARNING TASKS	CONTENT

1. Describe stair and balustrade assembly	• Safety
	• Tools and equipment
	• Types
	  ○ Straight
	  ○ Curved
	  ○ Housed
	  ○ Open
	• Forming/bending curved stringers and handrails
	• Assembly requirements
	  ○ Onsite
	  ○ In shop
	  ○ Knock down
	• Assembling staircase components
	  ○ Verifying dimensions
	  ▪ Rise and run conform to code
	  ○ Selecting adhesives and fasteners
	  ○ Selecting and applying clamps
	  ▪ Placement
	  ▪ Pressure
	  ▪ Time
	  ▪ Wedges
	  ○ Removing clamps
	  ○ Cleaning up

Line (GAC): S BUILD STAIRS AND BALUSTRADES

Competency: S4 Install stairs and balustrades

Objectives

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

- Describe installation of stairs and balustrades

LEARNING TASKS	CONTENT

1. Describe considerations for installing stairs and balustrades	• Codes
	  ○ Verifying required headroom
	  ○ Spacing of balustrades
	  ○ Rise and run ratios
	• Site conditions
	  ○ Thickness of finished floor
	  ○ Square of opening
	  ○ Accessibility
	  ○ Scheduling
	  ○ Coordinating with other trades
	• Hardware and fasteners

2. Describe installation of stairs and balustrades	• Safety
	• Tools and equipment
	  ○ Plum bob
	  ○ Laser level
	• Procedure
	  ○ Reassembling stair components on-site
	  ○ Locating studs and floor joists
	  ○ Determining hanging method
	  ▪ Plywood hanger
	  ▪ Birdsmouth
	  ▪ Kick plate
	  ○ Positioning assembled stairs in place
	  ○ Levelling and plumbing stairs and balustrades
	  ○ Adjusting stairs
	  ○ Securing stairs, balustrades, and newel posts

Line (GAC): T INSTALL SOLID SURFACE MATERIALS

Competency: T1 Breakout materials for solid surface

Objectives

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

- Breakout materials for solid surface

LEARNING TASKS

1. Breakout materials for solid surface

CONTENT

- Safety
- Tools and equipment
- Types
  - Solid surface
  - Avonite
- Materials
  - Solid surface
  - Glue blocks
  - Plywood support
- Adhesives
- Procedure
  - Verifying dimensions
  - Verifying requirements
  - Breaking out materials

Achievement Criteria

NOTE: Competency T1 Breakout materials for solid surface will be assessed with all of T Line in competency T3 Install solid surface materials.

Line (GAC): T INSTALL SOLID SURFACE MATERIALS

Competency: T2 Fabricate solid surface materials

Objectives

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

- Describe fabricating solid surface materials

LEARNING TASKS	CONTENT

1. Describe fabricating solid surface materials	• Safety
	  ○ Respirator
	• Tools and equipment
	  ○ CNC
	  ○ Routers
	  ○ Saws
	• Adhesives
	• Certification requirements
	• Build down requirements
	• Sink types
	  ○ Seamless
	  ○ Standard
	• Procedure
	  ○ Glue build ups
	  ○ Profiling edges
	  ○ Polishing edges
	  ○ Cutting out for fixtures
	  ○ Final sanding
	  ○ Cleaning up

Achievement Criteria

NOTE: Competency T2 Fabricate solid surface materials will be assessed with all of T Line in competency T3 Install solid surface materials.

Line (GAC): T INSTALL SOLID SURFACE MATERIALS

Competency: T3 Install solid surface materials

Objectives

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

- Install solid surface materials

LEARNING TASKS	CONTENT

1. Install solid surface materials	• Safety
	  ○ Respirator
	• Tools and equipment
	• Applications
	  ○ Counter tops
	  ○ Doors
	  ○ Drawer fronts
	• Fixtures
	  ○ Sinks
	  ○ Faucets
	  ○ Cooktops
	  ○ Soap dispensers
	• Procedure
	  ○ Cutting, fitting and scribing solid surface material
	  ○ Seaming joints on-site
	  ○ Sanding, polishing, and cleaning solid surface material
	  ○ Fitting fixtures
	  ○ Cleaning up

Achievement Criteria

NOTE:	**GAC T** Install solid surface materials will be assessed together in this competency
Performance	The learner will install a solid surface countertop with a profiled edge.
Conditions	The learner will be given • PPE • Tools and Equipment • Instructions • Materials
Criteria	The learner will be evaluated on • Safety • Accuracy • Time management

Level 4

Cabinetmaker

Line (GAC): B USE TOOLS AND EQUIPMENT

Competency: B3 Maintain automated and CNC equipment

Objectives

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

- Perform maintenance on complex CNC and automated equipment

LEARNING TASKS	CONTENT

1. Perform maintenance on complex CNC and automated equipment	• Safety
	  ○ PPE
	  ○ Lockout and tagout procedures
	  ○ Automatic emergency stop systems
	  ▪ Equipment specific
	• Types of equipment
	  ○ CNC machining centre
	  ○ CNC beam saw
	• Visual inspection
	  ○ Signs of damage
	  ○ Cleanliness
	  ○ Frayed cords
	• Cleaning and lubricating equipment
	• Dusting collection system
	  ○ Tight
	  ○ No leaks
	• Worn, dull, and damaged equipment
	  ○ Poor cutting
	  ○ Burning
	  ○ Inaccurate cuts
	• Guards
	  ○ Functional
	  ○ Placement

Line (GAC): B USE TOOLS AND EQUIPMENT

Competency: B4 Maintain finishing equipment

Objectives

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

- Maintain finishing equipment

LEARNING TASKS	CONTENT

1. Maintain finishing equipment	• Safety
	  ○ PPE
	• Cleaning
	• Lubricating
	• Lighting
	  ○ Daylight
	  ○ LED
	  ○ Halogen
	  ○ Lumens
	• Worn and damaged components
	  ○ Replacement
	  ○ Tips
	  ○ Air lines
	  ○ Changing filters
	• Ventilation
	  ○ Environmental considerations

Line (GAC): E USE COMMUNICATION AND MENTORING TECHNIQUES

Competency: E2 Use mentoring techniques

Objectives

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

- Describe effective leadership skills
- Describe mentorship techniques
- Describe anti-harassment and inclusivity

LEARNING TASKS	CONTENT

1. Describe effective leadership skills	• Modelling positive behaviour
	  ○ Punctuality
	  ○ Appropriate language
	  ○ Inclusivity
	  ○ Open-mindedness
	• Time mangement
	• Work ethic
	• Effective delegation
	• Patience

2. Describe mentorship techniques	• Encouragement
	• Forgiveness
	• Approachability
	• Compassion
	• Fairness
	• Inspiring
	• Building trust
	• Feedback
	  ○ Positive
	  ○ Constructive
	• Goal setting
	• Patience

3. Describe anti-harassment and inclusivity	• Awareness
	• Respect
	• Communication
	• Listening
	• Workplace culture
	• Code of Conduct and policies
	  ○ Workplace
	  ○ Builders Code
	  ○ Legislation
	• Reporting procedures
	• Equity in promotion
	• Accommodations

Line (GAC): G MACHINE COMPONENTS USING AUTOMATED AND CNC EQUIPMENT

Competency: G1 Set up automated and CNC equipment

Objectives

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

- Set up CNC machining centre for complex operations
- Set up CNC beam saw
- Set up automated equipment

LEARNING TASKS	CONTENT

1. Set up CNC machining centre for complex operations	• Safety
	• Calibrating equipment and tooling
	• Tooling types
	  ○ Router bits
	  ○ Saw blades
	  ○ Drill bits
	• Selecting and installing tooling
	• Selecting software
	  ○ Optimization
	  ○ Computer Aided Manufacturing (CAM)
	  ○ Computer Aided Design (CAD)
	  ○ Manual input
	• Programming machining centre according to software specifications
	• Running simulator

2. Describe CNC beam saw	• Safety
	• Purpose
	• Types
	  ○ Front-loading
	  ○ Rear-loading
	• Parts
	• Accessories
	• Loaders

3. Set up CNC beam saw	• Calibration
	• Selecting software
	  ○ Optimization
	  ○ Computer Aided Manufacturing (CAM)
	  ○ Computer Aided Design (CAD)
	  ○ Manual input
	  ▪ Single cut
	  ▪ Sequence cutting
	  ▪ Pattern cutting

Line (GAC): G MACHINE COMPONENTS USING AUTOMATED AND CNC EQUIPMENT

Competency: G2 Operate automated CNC equipment

Objectives

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

- Operate CNC machining centre for complex operations
- Operate CNC beam saw

LEARNING TASKS	CONTENT

1. Operate CNC machining centre for complex operations	• Safety
	• Applications
	• Cut types
	  ○ Helical
	  ○ Curves
	  ○ Multi-operation
	  ▪ Drilling, cutting, and routing in same program
	• Material inspection
	  ○ Flaws and defects
	  ○ Grading
	• Operation procedures
	  ○ Visual machine inspection
	  ○ Initial start up
	  ○ Calibration
	  ○ Loading/unloading materials
	  ○ Execution of program

2. Operate CNC beam saw	• Safety
	• Material inspection
	  ○ Flaws and defects
	  ○ Grading
	• Operation procedures
	  ○ Visual machine inspection
	  ○ Initial start up
	  ○ Calibration
	  ○ Loading/unloading materials
	  ○ Execution of program

Achievement Criteria 1

Performance	The learner will execute a CNC program for a CNC machining centre.
Conditions	The learner will be given • PPE • Instructions • Tools and equipment • Materials
Criteria	The learner will be evaluated on • Safety • Accuracy • Optimization

Achievement Criteria 2

Performance	The learner will execute a CNC program for a CNC beam saw.
Conditions	The learner will be given • PPE • Instructions • Tools and equipment • Materials
Criteria	The learner will be evaluated on • Safety • Accuracy • Optimization

Line (GAC): H CREATE CURVED COMPONENTS USING WOOD AND COMPOSITE MATERIALS

Competency: H1 Build forms

Objectives

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

- Build a form using CNC equipment

LEARNING TASKS	CONTENT

1. Build a form using CNC equipment	• Safety
	• Tools and equipment
	  ○ CNC equipment
	  ○ Software
	  ○ Screw guns
	  ○ Pneumatic nailers
	• Procedure
	  ○ Drawing shape in CAD
	  ○ Creating shape using CAM
	  ○ Creating program
	  ○ Running program
	  ○ Assembling form

Achievement Criteria

Performance	The learner will create a form using CNC equipment
Conditions	The learner will be given • PPE • Instructions • Tools and equipment • Materials
Criteria	The learner will be evaluated on • Safety • Accuracy • Time management

Line (GAC): H CREATE CURVED COMPONENTS USING WOOD AND COMPOSITE MATERIALS

Competency: H2 Perform curved laminating

Objectives

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

- Laminate curved components for furniture

LEARNING TASKS	CONTENT

1. Laminate curved components for furniture	• Safety
	• Tools and equipment
	  ○ CNC equipment
	• Selecting materials
	  ○ Solid wood
	  ○ Sheet goods
	  ○ Composite material
	• Selecting form
	• Selecting adhesives
	  ○ Open time
	  ○ Cure time
	  ○ Thermal setting
	  ○ Elasticity
	  ○ Viscosity
	  ○ Environmental considerations
	  ▪ VOCs
	  ▪ Humidity
	  ▪ Temperature
	• Selecting fasteners
	  ○ Type
	  ○ Holding power
	  ○ Sheer strength
	• Considerations
	  ○ Grain orientation
	  ○ Saw kerf
	  ○ Marking
	• Procedure
	  ○ Cutting material to specifications
	  ○ Applying adhesives/fasteners
	  ○ Placing material into form
	  ○ Applying pressure
	  ○ Allowing curing time
	  ○ Removing from form
	  ○ Cutting to final size

Achievement Criteria

Performance	The learner will create curved components for a piece of furniture.
Conditions	The learner will be given • PPE • Tools and equipment • Instructions • Materials
Criteria	The learner will be evaluated on • Safety • Accuracy • Procedure • Time management

Line (GAC): H CREATE CURVED COMPONENTS USING WOOD AND COMPOSITE MATERIALS

Competency: H3 Steam-form wood

Objectives

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

- Steam-form wood

LEARNING TASKS	CONTENT

1. Steam-form wood	• Safety
	• Tools and equipment
	  ○ Steam box
	• Inserting a tube
	  ○ PVC
	• Heating water to create steam
	• Placing wood in steam box
	• Allowing accurate steam time
	• Removing wood
	• Clamping steam-formed wood to a form immediately
	• Allowing to cure
	• Cutting to final size

Line (GAC): J APPLY VENEER

Competency: J3 Adhere veneer to substrate

Objectives

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

- Adhere multiple veneer panels with continuous grain

LEARNING TASKS	CONTENT

1. Adhere multiple veneer panels with continuous grain	• Safety
	  ○ PPE
	  ○ Respirator
	• Tools and equipment
	• Grain matching
	  ○ Aligning veneer
	  ○ Book match
	  ○ Slip match
	• Procedure
	  ○ Selecting adhesives
	  ○ Applying adhesive to substrate
	  ○ Pressing veneer to panel
	  ○ Allowing for cure time
	  ○ Removing from press

Achievement Criteria

NOTE: Competency J3 Adhere veneer to substrate will be assessed in J4 Perform final clean-up of laminated sheets Achievement Criteria.

Line (GAC): J APPLY VENEER

Competency: J4 Perform final clean-up of laminated sheets

Objectives

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

- Perform final clean-up on multiple veneer panels with continuous grain

LEARNING TASKS	CONTENT

1. Perform final clean-up on multiple veneer panels with continuous grain	• Removing excess glue
	• Scraping veneer tape
	• Trimming edges
	• Cutting to final size
	  ○ Types of joints
	  ▪ Mitered
	  ▪ Biscuit spline
	  ▪ Rebate
	• Sanding panel
	  ○ Grit
	  ○ Colour matching
	  ○ Finishing requirements
	  ○ With grain
	  ○ Removing defects
	• Repairing damage
	  ○ Removing defects
	  ○ Ironing out dents
	  ○ Patches

Achievement Criteria

NOTE: Competency **J3 Adhere veneer to substrate** will be assessed in this Achievement Criteria.

Performance — The learner will perform final clean-up of multiple veneered panels that are:

- Grain matched
- Mitered
- End matched (waterfall)

Conditions — The learner will be given

- PPE
- Tools and equipment
- Instructions
- Materials

Criteria — The learner will be evaluated on

- Safety
- Accuracy
- Time management

Line (GAC): M ASSEMBLE ARCHITECTRUAL MILLWORK PRODUCTS

Competency: M1 Assemble architectural millwork components in shop

Objectives

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

- Describe assembly of architectural millwork components
- Assemble architectural millwork components

LEARNING TASKS	CONTENT

1. Describe assembly of architectural millwork components	• Types
	  ○ Panelling
	  ○ Standing and running trim
	  ○ Doors
	  ○ Frames
	  ○ Sidelights
	  ○ Glazed partitions
	  ○ Wainscotting
	• Layout
	  ○ Architectural specifications
	  ○ Architectural drawings
	  ○ Shop drawings
	  ○ Verifying final dimensions of assembled product
	• Considerations
	  ○ Confirming size restrictions
	  ○ Determining pre-finishing requirements
	  ○ Confirming hardware requirements
	  ○ Confirming shipping requirements

2. Assemble architectural millwork components	• Safety
	• Tools and equipment
	• Procedure
	  ○ Identifying architectural drawings
	  ○ Fabricating architectural millwork components
	  ○ Assembling architectural millwork components
	  ○ Performing final sanding
	  ○ Confirming architectural millwork components

Achievement Criteria

Performance	The learner will assemble architectural millwork components.
Conditions	The learner will be given • PPE • Tools and equipment • Specifications • Instructions • Materials
Criteria	The learner will be evaluated on • Safety • Accuracy • Time management

Line (GAC): M ASSEMBLE ARCHITECTRUAL MILLWORK PRODUCTS

Competency: M2 Assemble architectural fixtures in shop

Objectives

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

- Describe assembly of architectural fixtures in shop
- Assemble architectural fixtures in shop

LEARNING TASKS	CONTENT

1. Describe assembly of architectural fixtures	• Types
	  ○ Store and office fixtures
	  ○ Benches
	  ○ Custom display cases
	  ○ Built-ins
	• Layout
	  ○ Architectural specifications
	  ○ Architectural drawings
	  ○ Shop drawings
	• Specialty materials
	  ○ Glass
	  ○ Leather
	  ○ Solid surface
	  ○ Stainless steel
	• Considerations
	  ○ Special site conditions
	  ○ Confirming size restrictions
	  ○ Determining pre-finishing requirements
	  ○ Confirming hardware requirements
	  ○ Confirming shipping requirements

2. Assemble architectural fixtures in shop	• Safety
	• Tools and equipment
	• Procedure
	  ○ Verifying final dimensions of assembled product
	  ○ Dry fitting knock down/section components
	  ○ Building architectural fixtures in as few sections as possible
	  ▪ Height restrictions
	  ▪ Shipping constraints
	  ▪ Elevators

LEARNING TASKS

CONTENT

- Constructing architectural fixtures
- Speciality material assembly procedures
  - Glass
  - Stainless steel

Line (GAC): R INSTALL ARCHITECTRUAL MILLWORK PRODUCTS AND MOULDINGS

Competency: R1 Perform final on-site assembly and fastening of architectural millwork products

Objectives

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

- Describe considerations for installing architectural millwork products
- Describe shipping and receiving architectural millwork products
- Describe installation of architectural millwork products

LEARNING TASKS	CONTENT

1. Describe considerations for installing architectural millwork products	• Types
	  ○ Panelling
	  ○ Reception desks
	  ○ Standing and running trim
	  ○ Doors
	  ○ Frames
	  ○ Sidelights
	  ○ Glazed partitions
	  ○ Store fixtures
	• Site conditions
	  ○ Heat
	  ○ Humidity
	  ○ Building access
	  ○ Elevator
	  ○ Site location
	  ○ Load and unload restrictions
	  ○ Coordination with other trades

2. Describe shipping and receiving architectural millwork products	• Shipping list
	• Identifying fragile products
	• Marking room numbers on products
	• Delivering to area/room
	• Protective materials and equipment
	  ○ Blankets
	  ○ Bracing
	  ○ Skids
	  ○ Shrink wrap
	• Time management and scheduling
	• Disposal of packaging

LEARNING TASKS

3. Describe installation of architectural millwork products

CONTENT

- Safety
- Tools and equipment
- Layout
  - Floor and ceiling level
  - Walls plumb
  - Products within the room
  - Installation sequence
- Protecting surrounding areas
  - Floors
  - Walls
  - Doors
  - Countertops
- Identifying location of building utilities
  - Plumbing
  - Sheet metal
  - Permenant appliances
  - Electrical
- Identifying fasteners and hardware
  - Connector bolts
  - Joint fasteners
  - Blind fasteners
  - Z-clip
- Identifying adhesives, sealants, glues, and caulking
- Installation procedure
  - Checking for level
  - Faring out walls
  - Fastening/adhering wall pannelling
  - Scribing
  - Final adjustment
  - Cleaning up
  - Protecting product
  - Disposal of waste

Line (GAC): R INSTALL ARCHITECTRUAL MILLWORK PRODUCTS AND MOULDINGS

Competency: R2 Install mouldings

Objectives

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

- Describe installation of mouldings

LEARNING TASKS

1. Describe installation of mouldings

CONTENT

- Safety
- Tools and equipment
- Fasteners and adhesives
- Procedure
    - Locating structural components
    - Layout
        - Material quantity
        - Sequence
    - Cut and cope
    - Positioning and securing
    - Concealing nail/screw holes
    - Cleaning up
    - Disposal of waste

Line (GAC): R INSTALL ARCHITECTURAL MILLWORK PRODUCTS AND MOULDINGS

Competency: R3 Finalize installation of architectural millwork products and mouldings

Objectives

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

- Describe finalization of architectural millwork products and mouldings

LEARNING TASKS

1. Describe finalization of architectural millwork products and mouldings

CONTENT

- Safety
- Tools and equipment
- Adhesives
- Fasteners
- Silicone and caulking
- Applying finishing details
  - Screwing cap covers
  - Adjusting door and drawer gaps
  - Testing functionality of hardware
  - Final clean up
- Compiling a deficiency list/inspection
  - Architect
  - AWMAC
  - Owner
  - Contract
- Repairing imperfections
  - Dents
  - Chips
  - Scratches

Line (GAC): U CREATE DECORATIVE WOODWORK

Competency: U1 Perform marquetry

Objectives

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

- Perform marquetry

LEARNING TASKS

1. Perform marquetry

CONTENT

- Safety
- Tools and equipment
  - Veneer saw
  - Veneer tape
  - Stitcher
  - Utility knife
- Considerations
  - Reducing tear out/chip out
  - Precision
- Procedure
  - Determining cutting process
  - Verifying dimensions
  - Determining joint method
  - Creating template (if required)
  - Creating jig (if required)
  - Cutting components
    - Backer material if required
  - Joining components
    - Stitcher
    - Veneer tape
  - Selecting substrate
    - MDF
    - Particle board
  - Selecting adhesives
    - Thermal setting
    - PVA
    - Crosslink
  - Glueing components to substrate
  - Trimming edges
  - Performing final sanding
  - Cleaning up

Line (GAC): U CREATE DECORATIVE WOODWORK

Competency: U2 Perform carving

Objectives

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

- Describe performing carving

LEARNING TASKS	CONTENT

1. Describe performing carving	• Safety
	• Tools and equipment
	  ○ Speciality chisels
	• Types
	  ○ Chip
	  ○ Relief
	  ○ Sculpting
	• Procedure
	  ○ Breaking out wood and laminated pieces
	  ○ Laying out design on rough piece
	  ○ Removing excess material
	  ○ Securing work piece
	  ○ Hand carving work piece
	  ○ Cleaning up work piece

Line (GAC): U CREATE DECORATIVE WOODWORK

Competency: U3 Perform wood turning

Objectives

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

- Perform wood turning

LEARNING TASKS	CONTENT

1. Perform wood turning	• Safety
	• Maintenance
	  ○ Sharpening
	• Tools and equipment
	  ○ Lathe
	  ○ Cutting tools
	  ○ Scraping tools
	  ○ Gouging tools
	  ○ Measurement tools
	• Materials
	  ○ Solid wood
	  ○ Resin
	• Procedure
	  ○ Determining turning method
	  ○ Preparing materials
	  ○ Selecting revolutions per minute (RPM)
	  ○ Securing tool rest
	  ○ Selecting tools and equipment
	  ○ Turning project to meet specifications
	  ○ Sanding
	  ○ Applying finish if required
	  ○ Removing stock
	  ○ Cutting off excess
	  ○ Cleaning up

Achievement Criteria

Performance	The learner will use spindle turning or face-plate turning methods on the lathe to produce a basic project.
Conditions	The learner will be given • PPE • Tools and equipment • Instructions • Materials
Criteria	The learner will be evaluated on • Safety • Accuracy • Finished product • Time management

Line (GAC): V RESTORE WOODWORK

Competency: V1 Repair woodwork for restoration

Objectives

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

- Describe repairing woodwork for restoration

LEARNING TASKS	CONTENT

1. Describe repairing woodwork for restoration	• Safety
	• Tools and equipment
	• Applications
	  ○ Furniture
	  ○ Cabinetry
	  ○ Millwork
	  ○ Antiques
	• Considerations
	  ○ Solid wood species
	  ○ Adhesives
	  ▪ Antique vs. modern
	  ○ Joints
	• Procedure
	  ○ Determining restoration requirements
	  ▪ Repairing imperfections and damage
	  ▪ Replication
	• Selecting materials
	• Laying out and producing joints
	• Applying adhesives

Line (GAC): V RESTORE WOODWORK

Competency: V2 Refinish woodwork for restoration

Objectives

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

- Describe restoration principles
- Describe refinishing woodwork for restoration

LEARNING TASKS	CONTENT

1. Describe restoration principles	• Furniture styles
	  ○ Duncan Phyfe
	  ○ Chippendale
	  ○ French provincial
	  ○ Victorian
	• Historical finishing techniques
	  ○ Shellac
	• Disguising imperfections
	  ○ Selecting grain direction and species
	  ○ Toning

2. Describe refinishing woodwork for restoration	• Safety
	• Tools and equipment
	  ○ Brushes
	  ○ Roller
	  ○ Spray guns
	  ○ Sponges
	  ○ Rags
	• Finishes
	  ○ Stains
	  ○ Bleaches
	  ○ Toning
	  ○ Shellac
	  ○ Dyes
	  ○ Oils
	  ○ Waxes
	  ○ Lacquers
	• Procedure
	  ○ Selecting finish
	  ▪ Compatibility
	  ▪ Colour
	  ▪ Sheen
	  ○ Stripping old finish

LEARNING TASKS	CONTENT
	○ Sanding ○ Applying finish ○ Cleaning up

Section 4

ASSESSMENT GUIDELINES

Assessment Guidelines – Level 1

Level 1 Grading Sheet: Subject Competency and Weightings

PROGRAM: IN-SCHOOL TRAINING:	CABINETMAKER LEVEL 1

LINE	SUBJECT COMPETENCIES	THEORY WEIGHTING	PRACTICAL WEIGHTING
A	PERFORM SAFETY-RELATED FUNCTIONS	10%	5%
B	USE TOOLS AND EQUIPMENT	13%	10%
C	ORGANIZE WORK	12%	15%
D	PERFORM ROUTINE WORK PRACTICES	5%	0%
E	USE COMMUNICATION AND MENTORING TECHNIQUES	5%	0%
F	MACHINE COMPONENTS USING STATIONARY AND PORTABLE POWER TOOLS	20%	40%
I	LAMINATE WOOD AND COMPOSITE MATERIALS	5%	5%
K	APPLY LAMINATE SHEETS	10%	0%
L	ASSEMBLE CABINETS AND FURNITURE	10%	15%
N	PREPARE SURFACE FOR FINISHING	10%	10%
	Total	100%	100%
In-school theory/practical subject competency weighting		20%	80%
Final in-school percentage score		IN-SCHOOL %	

In-school Percentage Score Combined theory and practical subject competency multiplied by	80%
Standardized Level Exam Percentage Score The exam score is multiplied by	20%
Final Percentage Score	FINAL%

Assessment Guidelines – Level 2

Level 2 Grading Sheet: Subject Competency and Weightings

PROGRAM: IN-SCHOOL TRAINING:	CABINETMAKER LEVEL 2		
LINE	**SUBJECT COMPETENCIES**	**THEORY WEIGHTING**	**PRACTICAL WEIGHTING**
C	ORGANIZE WORK	20%	10%
D	PERFORM ROUTINE WORK PRACTICES	10%	10%
I	LAMINATE WOOD AND COMPOSITE MATERIALS	10%	5%
K	APPLY LAMINATE SHEETS	10%	5%
L	ASSEMBLE CABINETS AND FURNITURE	15%	35%
O	FINISH WOOD PRODUCTS	15%	15%
P	MODIFY PRODUCTS TO SITE CONDITIONS	10%	5%
Q	INSTALL CABINETS AND COUNTERTOPS	10%	15%
	Total	100%	100%
In-school theory/practical subject competency weighting		20%	80%
Final in-school percentage score		IN-SCHOOL %	

In-school Percentage Score Combined theory and practical subject competency multiplied by	80%
Standardized Level Exam Percentage Score The exam score is multiplied by	20%
Final Percentage Score	FINAL%

Assessment Guidelines – Level 3

Level 3 Grading Sheet: Subject Competency and Weightings

PROGRAM: IN-SCHOOL TRAINING:	CABINETMAKER LEVEL 3

LINE	SUBJECT COMPETENCIES	THEORY WEIGHTING	PRACTICAL WEIGHTING
B	USE TOOLS AND EQUIPMENT	5%	5%
D	PERFORM ROUTINE WORK PRACTICES	5%	15%
G	MACHINE COMPONENTS USING AUTOMATED AND CNC EQUIPMENT	20%	15%
H	CREATE CURVED COMPONENTS USING WOOD AND COMPOSITE MATERIALS	10%	35%
J	APPLY VENEER	10%	10%
L	ASSEMBLE CABINETS AND FURNITURE	10%	0%
O	FINISH WOOD PRODUCTS	15%	10%
S	BUILD STAIRS AND BALUSTRADES	15%	0%
T	INSTALL SOLID SURFACE MATERIALS	10%	10%
	Total	100%	100%
In-school theory/practical subject competency weighting		20%	80%
Final in-school percentage score		IN-SCHOOL %	

In-school Percentage Score Combined theory and practical subject competency multiplied by	80%
Standardized Level Exam Percentage Score The exam score is multiplied by	20%
Final Percentage Score	FINAL%

Assessment Guidelines – Level 4

Level 4 Grading Sheet: Subject Competency and Weightings

PROGRAM: IN-SCHOOL TRAINING:	CABINETMAKER LEVEL 4		
LINE	**SUBJECT COMPETENCIES**	**THEORY WEIGHTING**	**PRACTICAL WEIGHTING**
B	USE TOOLS AND EQUIPMENT	5%	0%
E	USE COMMUNICATION AND MENTORING TECHNIQUES	10%	0%
G	MACHINE COMPONENTS USING AUTOMATED AND CNC EQUIPMENT	20%	25%
H	CREATE CURVED COMPONENTS USING WOOD AND COMPOSITE MATERIALS	10%	15%
J	APPLY VENEER	15%	15%
M	ASSEMBLE ARCHITECTURAL MILLWORK PRODUCTS	10%	35%
R	INSTALL ARCHITECTURAL MILLWORK PRODUCTS AND MOULDINGS	15%	0%
U	CREATE DECORATIVE WOODWORK	10%	10%
V	RESTORE WOODWORK	5%	0%
	Total	100%	100%
In-school theory/practical subject competency weighting		40%	60%
Final in-school percentage score Apprentices must achieve a minimum 70% as the final in-school percentage score to be eligible to write the Interprovincial Red Seal exam.		IN-SCHOOL %	

All apprentices who complete Level 4 of the Cabinetmaker program with a FINAL level mark of 70% or greater will write the Interprovincial Red Seal examination as their final assessment.

SkilledTradesBC will enter the apprentices Cabinetmaker Red Seal Interprovincial examination mark in SkilledTradesBC Portal. A minimum mark of 70% on the examination is required for a pass.

Section 5

TRAINING PROVIDER STANDARDS

Facility Requirements

Classroom Area

- Comfortable seating and tables suitable for training, teaching, and lecturing.
- Compliance with all local and national fire codes and occupational safety requirements.
- Lighting controls to allow easy visibility of projection screen allowing students to take notes.
- Windows must have shades or blinds to adjust sunlight.
- Heating/air conditioning for comfort all year round.
- In-room temperature regulation and ventilation to ensure comfortable room temperature.
- Acoustics in the room must allow the instructor to be heard.
- White marking board with pens and eraser (optional: flipchart in similar size).
- Projection screen or projection area at front of classroom.
- Overhead projector and/or multi-media projector.

Shop Area

- Ceiling shall be a minimum height of sixteen feet or height approved through the building engineer.
- Suitable demonstration area.
- Lighting appropriate for good vision in ambient light.
- Compliance with all local and national fire codes and occupational safety requirements.
- Must meet Municipal and Provincial bylaws in regards to waste water management and environmental laws.
- Ability to enclose a separate aluminum repair area (i.e. curtained).

Lab Requirements

- Does not apply to this program.

Student Facilities

- Does not apply to this program.

Instructor's Office Space

- Does not apply to this program.

Tools and Equipment

Shop Equipment

Required Tools and Equipment

General – All levels

- Air compressor
- Assembly squares
- Awl
- Bearers
- Bench grinder
- Bench hooks
- Biscuit joiner
- CAD software
- CAM software
- Cabinet scrapers
- Carbide scribers
- Centre punches
- Cold chisels
- Cold press
- Computers
- Dollies
- Double spindle dowel boring machine
- Dovetailer
- Drills – Cordless
- Drills – 100v
- Drill press
- Dust collector
- Feather boards
- Glue brushes
- Glue spreader
- Grease guns
- Honing stone
- Industrial shop vacuums
- J-roller
- Jigs
- Jointer
- Lubricant
- Moisture meter
- Mortising machine
- Pallet jack
- Pin punches
- Power feeder for shaper
- Push blocks
- Push brooms
- Routers
- Saw horses
- Scale (weight)
- Screwguns
- Shaper
- Sliding push-fences
- Socket sets
- Syringes
- Table router
- Tablesaw L-Fences
- Thickness planer
- Vise – grips
- Wheel dressers
- Wrenches
- Wire brush
- Wood lathe
- Woodworker's bench vises

- Iron
- Work benches

Saws

- Abrasive cut-off saw for metals
- Bandsaw
- Circular saw
- CNC beam saw
- Compound mitre saw
- Coping saw
- Hack saw
- Japanese saw
- Jig saw
- Mitre saw
- Radial arm saw
- Table saw

Sanders

- Belt sander
- Disk sander
- Horizontal edge sander
- Orbital sanders
- Spindle sander
- Stroke sander
- Vertical edge sander
- Widebelt sander

Nailers and staplers

- Brad nailers
- Finish nailers
- Staplers

Hammers and mallets

- Ball-peen hammer
- Claw hammers
- Deadblow hammers
- Rubber mallets
- Wooden mallets

Bits

- Brad-point bits
- Combination bits
- Countersink bits
- Euro-hinge bits
- Expansion bits
- Forstner bits
- Holesaw bits
- Multi-spur bits
- Spade bits
- Twist drill bits
- Vix bits

Clamps

- C clamp
- Clamping stands
- Pipe clamp
- Spring clamp

- F clamp
- Strap clamp

Planes

- Fore plane
- Jointer plane
- Low-angle block plane

Files

- Files – auger bit
- Files – chainsaw
- Files – rat tail
- Files – triangular
- Wood rasps

Knives, cutters, and scrapers

- Aviation shears
- Burnisher
- End cutters
- Glass cutters
- Olfa knives
- Putty knives
- Scratch awl
- Side cutters

Pliers

- Pliers – channel
- Pliers – linesman
- Pliers – needle nose

Drawing, measurement, and levelling

- Calipers (inside)
- Calipers (outside)
- Chalk lines
- Compasses
- Drafting equipment
- Drafting tables
- Framing square
- Levels
- Plumb bob
- Straight edges
- Scale ruler
- Trammel points
- Vernier calipers

Required Tools and Equipment – By Level

Level 1

- Single spindle dowel boring machine

Level 2

- Automatic edge banding machine
- CNC point to point machining centre
- Guillotine or veneer saw
- Laser level
- Sliding panel saw
- Spray booth
- Spray system
- Vacuum press

Level 3

- Automatic edge banding machine
- CNC point to point machining centre
- Domino joiner
- Doweling jig
- Guillotine or veneer saw
- Multiple spindle drill
- Hot press
- Plug cutters
- Power plane
- Sliding panel saw
- Spokeshaves
- Spray booth
- Spray system
- Stitcher
- Vacuum press

Level 4

- Automatic edge banding machine
- CNC point to point machining centre
- Domino joiner
- Doweling jig
- Guillotine or veneer saw
- Hot press
- Plug cutters
- Power plane
- Sliding panel saw
- Spray booth
- Spray system
- Steam bending box
- Stitcher
- Power plane

Recommended Tools and Equipment

General – All Levels

- Angle finder
- Angle grinder
- Clamp carrier
- CNC router
- Detail sander
- Downdraft table
- Drum sander
- Flycutters
- Frame press
- Glue spreading machine
- Heat gun
- Hot melt glue gun
- Mitre clamps
- Mitre trimmer
- Plotter
- Profile gauge
- Radio frequency gluer
- Reciprocating saw
- Roll coater
- Scroll saw
- Speciality planes
- Tack hammers
- Tenoner
- Tin snips
- T-square

Recommended Tools and Equipment – By Level

Level 1

- Rip saw

Level 2

- Keyhole saw
- Stud finder

Level 3

- Carving chisels
- Case clamp
- CNC shaper
- Lift table
- Powder actuated tools
- Profile grinder
- Vacuum lifting device

Level 4

- Case clamp
- CNC shaper
- Lift table
- Powder actuated tools
- Profile grinder
- Vacuum lifting device

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) containing:

- 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

Reference Materials

Required Reference Materials

- Auto CAD Essentials, AICO 1000
- Woodworker's Hand Tools, Peters, Rick
- Woodworker's Power Tools, Peters, Rick
- Training Provider developed resources

Recommended Resources

- Cabinetmaking and Millwork, Feirer, John L.
- Modern Cabinetmaking, Umstattd, William D.
- Architectural Woodwork Manufacturers Association of Canada (AWMAC)
- North American Architectural Woodwork Standards (NAAWS)
- National Kitchen and Bathroom Association (NKBA)

Instructor Requirements

Occupation Qualification

The instructor must possess:

- Cabinetmaker - Certificate of Qualification with an Interprovincial Red Seal endorsement, or
- Cabinetmaker (Joiner) - Certificate of Qualification with an Interprovincial Red Seal endorsement, or
- Joiner - Certificate of Qualification with an Interprovincial Red Seal endorsement, or
- Certificate of Qualification from another Canadian jurisdiction complete with Interprovincial Red Seal endorsement.

Work Experience

- Must have a minimum of 5 years experience as Cabinetmaker/Cabinetmaker (Joiner)/Joiner journeyperson.

Instructional Experience and Education

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

- Instructor's Diploma or equivalent
- A degree in Education

Appendices

Appendix A
Acronyms

AWMAC	Architectural Woodworking Manufacturing Association of Canada
CAD	Computer-assisted design
CAM	Computer Aided Manufacturing
CNC	Computer numeric control
CSA	Canadian Standards Association
FSC	Forest Stewardship Council
HVLP	High Volume Low Pressure
LEED	Leadership in Energy and Environmental Design
MDF	Medium-density fibreboard
NAAWS	North American Architectural Woodwork Standards
NGR	Non-grain-raising
NKBA	National Kitchen and Bath Association
OHS	Occupational Health and Safety
PDS	Product Data Sheets
PVA	Polyvinyl Acetate
RPM	Revolutions per minute
SDS	Safety Data Sheets
VOCs	Volatile Organic Compounds
WHMIS	Workplace Hazardous Materials Information System

Appendix B
Previous Contributors

The Cabinetmaker (Joiner) (2013) Program Outline was prepared with the advice and direction of an industry steering committee convened initially by the Industry Training Organization (ITO). Members included:

- Ron Adamson
- Brandon Bevans
- Fred Boonstra
- Daryl Bowers
- Dan Bruno
- Tracy Burrows
- Chris Feller
- Alex Musso
- Robert Ruggiero
- Josh Towsley

Appendix C
Summary of Achievement Criteria

Achievement Criteria are included for competencies that require a practical assessment. 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. 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 evaluation criteria.

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 performances may also be used to replace individual performances where appropriate.

The following tables summarize the practical assessments for each level. **For details, please refer to the Achievement Criteria following the particular competency in the Program Content section.**

CABINETMAKER – LEVEL 1 SUMMARY OF ACHIEVEMENT CRITERIA	
SUBJECT COMPETENCY	**ACHIEVEMENT CRITERIA TASK**
A2 Use personal protective equipment (PPE) and safety equipment	The learner will wear appropriate PPE for job tasks.
B1 Use hand, portable power, and pneumatic tools and equipment	The learner will perform maintenance on equipment.
B2 Use stationary power tools	The learner will use stationary power tools.
C2 Plan projects	The learner will prepare an estimate.
C3 Create designs	1. The learner will create a basic shop drawing by hand.
	2. The learner will produce a shop drawing using CAD.
C4 Perform layout of cabinets, furniture, and architectural millwork	The learner will calculate board footage and cost for a project.
F1 Breakout solid wood	1. The learner will breakout and dress solid wood. **NOTE:** Competencies **F1** and **F2** will be assessed together in this achievement criteria.
	2. The learner will identify samples of wood species.
F3 Shape solid wood	The learner will route a profile on a solid wood surface.
F5 Machine sheet materials	The learner will machine sheet goods for a project.

F6 Machine joints	The learner will fabricate a joint for a project.
F7 Perform sanding	The learner will perform sanding on a project in preparation for finishing.
I3 Clamp pieces together	The learner will laminate material for a project. **NOTE:** Competencies **I1** and **I2** will be assessed together with Competency **I3**.
L1 Assemble cabinet components	The learner will assemble a project. **NOTE:** Competencies **L1** and **L2** will be assessed in this Achievement Criteria.
N1 Repair imperfections	The learner will apply a patch with consistent grain and colour on appropriate material. **NOTE:** Competencies **N2** and **N3** will be assessed together with Competency **N1**.

CABINETMAKER – LEVEL 2 SUMMARY OF ACHIEVEMENT CRITERIA	
SUBJECT COMPETENCY	**ACHIEVEMENT CRITERIA TASK**
C3 Create designs	The learner use CAD to draft a project.
C4 Perform layout of cabinets, furniture, and architectural millwork	The learner will produce a drawing with a cutting bill/plan.
D2 Fabricate jigs and templates	The learner will make a jig.
D4 Select hardware	The learner will perform a hardware take off.
I3 Clamp pieces together	The learner will perform **multiple** laminations for a project. **NOTE:** Competencies **I1** and **I2** will be assessed together with Competency **I3**.
K4 Perform final clean-up of laminated sheets	The learner will apply laminate sheet to substrate and perform final clean-up to edge treatment. **NOTE:** Competencies **K1, K2, and K3** will be assessed together with Competency **K4**.
L1 Assemble cabinet components	The learner will assemble a cabinet with multiple openings. **NOTE:** Competencies **L2 and L3** will be assessed together with Competency **L1**.
O2 Apply finishing material manually	The learner will stain a flat panel manually. **NOTE:** Competency **O1** will be assessed together with Competency **O2**.
O3 Spray on finishing materials	The learner will spray a flat panel with a solvent-based transparent finish. **NOTE:** Competency **O1** will be assessed together with Competency **O3**.
P2 Scribe products to fit on site	The learner will scribe product to suit installation requirements.
Q1 Perform final on-site assembly and fastening of cabinets and countertops	The learner will install lower cabinets with countertops, scribed to the wall including a toe kick.

CABINETMAKER – LEVEL 3 SUMMARY OF ACHIEVEMENT CRITERIA	
SUBJECT COMPETENCY	**ACHIEVEMENT CRITERIA TASK**
B3 Maintain automated and CNC equipment	The learner will complete a maintenance assessment
D2 Fabricate jigs and templates	The learner will fabricate a jig from a template using the shaper or overhead router.
G1 Set up automated and CNC equipment	The learner will create a basic CNC program.
G2 Operate automated and CNC equipment	The learner will use automated equipment.
H1 Build forms	The learner will use a shaper to create a form for curved components.
H2 Perform curved laminating	The learner will create a curved component.
GAC J APPLY VENEER	The learner will adhere veneer to a substrate that is: • Cut to final size • Defect-free • Ready for finishing **NOTE:** All of **GAC J** will be assessed in **Competency J4 Achievement Criteria**
O2 Apply finishing material manually	The learner will colour match a wood sample. **NOTE:** Competency **O1** will be assessed together with Competency **O2**.
O3 Spray on finishing material	The learner will spray a project with water-based finish. **NOTE:** Competency **O1** will be assessed together with Competency **O3**.
GAC T INSTALL SOLID SURFACE MATERIALS	The learner will install a solid surface countertop with a profiled edge. **NOTE: All of GAC T assessed in Competency T3 Achievement Criteria**

CABINETMAKER – LEVEL 4 SUMMARY OF ACHIEVEMENT CRITERIA	
SUBJECT COMPETENCY	**ACHIEVEMENT CRITERIA TASK**
G2 Operate automated CNC equipment	1. The learner will execute a CNC program for a CNC machining centre.
	2. The learner will execute a CNC program for a CNC beam saw.
H1 Build forms	The learner will create a form using CNC equipment.
H2 Perform curved laminating	The learner will create curved components for a piece of furniture.
J4 Perform final clean-up of laminated	The learner will perform final clean-up of multiple veneered panels that are: • Grain matched • Mitered • End matched (waterfall) **NOTE:** Competency **J3** will be assessed in this Achievement Criteria.
M1 Assemble architectural millwork components in shop	The learner will assemble architectural millwork components.
U3 Perform wood turning	The learner will use spindle turning or face-plate turning methods on the lathe to produce a basic project.