Apprenticeship and Industry Training

Cabinetmaker

Apprenticeship Course Outline

3604.2 (2004)

Alberta

Apprenticeship and Industry Training

ALBERTA LEARNING CATALOGUING IN PUBLICATION DATA

Alberta. Alberta Learning. Apprenticeship and Industry Training.
Cabinetmaker program.

ISBN 0-7785-2589-9

1. Cabinetmakers - Study and teaching - Alberta. 2. Apprentices - Alberta.
3. Occupational training - Alberta. I. Title. II. Series: Apprenticeship
training.

HD4885.C2.C15.A333 2004 373.27

Cabinetmaker
Table of Contents

Cabinetmaker Table of Contents 1
Apprenticeship 2
Apprenticeship and Industry Training System 2
Apprenticeship Safety 4
Procedures for Recommending Revisions to the Course Outline 5
Apprenticeship Route toward Certification 6
Cabinetmaker Training Profile 7

Course Outline

First Period Technical Training 10
Second Period Technical Training 18
Third Period Technical Training 25
Fourth Period Technical Training 30

Apprenticeship

Apprenticeship is post-secondary education with a difference. Apprenticeship begins with finding an employer. Employers hire apprentices, pay their wages and provide on-the-job training and work experience. Approximately 80 per cent of an apprentice's time is spent on the job under the supervision of a certified journeyperson or qualified tradesperson. The other 20 per cent involves technical training provided at, or through, a post-secondary institution – usually a college or technical institute.

To become certified journeypersons, apprentices must learn theory and skills, and they must pass examinations. Requirements for certification—including the content and delivery of technical training—are developed and updated by the Alberta Apprenticeship and Industry Training Board on the recommendation of Cabinetmaker Provincial Apprenticeship Committee.

The graduate of the Cabinetmaker apprenticeship program is a certified journeyperson who will:

- know the characteristics of wood, wood products or substitutes used in industrial woodworking
- be proficient with the safe use of hand tools, powered machines and equipment used in industrial woodworking
- read and interpret plans and specifications and prepare layouts, working drawings and cutting lists
- calculate material quantities
- detail components and fixtures according to specifications and assume responsibility for the end product
- relate to job situations and other trades that precede or follow
- know the characteristics of glues and adhesives and their accepted usage in industry
- perform assigned tasks in accordance with quality and production standards required in industry
- know techniques for assembly and installation of hardware and other component
- perform assigned tasks in accordance with quality and production standards required by industry

Apprenticeship and Industry Training System

Industry-Driven

Alberta's apprenticeship and industry training system is an industry-driven system that ensures a highly skilled, internationally competitive workforce in more than 50 designated trades and occupations. This workforce supports the economic progress of Alberta and its competitive role in the global market. Industry (employers and employees) establishes training and certification standards and provides direction to the system through an industry committee network and the Alberta Apprenticeship and Industry Training Board. The Alberta government provides the legislative framework and administrative support for the apprenticeship and industry training system.

Alberta Apprenticeship and Industry Training Board

The Alberta Apprenticeship and Industry Training Board provides a leadership role in developing Alberta's highly skilled and trained workforce. The board's primary responsibility is to establish the standards and requirements for training and certification in programs under the Apprenticeship and Industry Training Act. The board also provides advice to the Minister of Advanced Education and Technology on the needs of Alberta's labour market for skilled and trained workers, and the designation of trades and occupations.

The thirteen-member board consists of a chair, eight members representing trades and four members representing other industries. There are equal numbers of employer and employee representatives.

Industry Committee Network

Alberta's apprenticeship and industry training system relies on a network of industry committees, including local and provincial apprenticeship committees in the designated trades, and occupational committees in the designated occupations. The network also includes other committees such as provisional committees that are established before the designation of a new trade or occupation comes into effect. All trade committees are composed of equal numbers of employer and employee representatives. The industry committee network is the foundation of Alberta's apprenticeship and industry training system.

Local Apprenticeship Committees (LAC)

Wherever there is activity in a trade, the board can set up a local apprenticeship committee. The board appoints equal numbers of employee and employer representatives for terms of up to three years. The committee appoints a member as presiding officer. Local apprenticeship committees:

- monitor apprenticeship programs and the progress of apprentices in their trade, at the local level
- make recommendations to their trade's provincial apprenticeship committee (PAC) about apprenticeship and certification in their trade
- promote apprenticeship programs and training and the pursuit of careers in their trade
- make recommendations to the board about the appointment of members to their trade's PAC
- help settle certain kinds of disagreements between apprentices and their employers
- carry out functions assigned by their trade's PAC or the board

Provincial Apprenticeship Committees (PAC)

The board establishes a provincial apprenticeship committee for each trade. It appoints an equal number of employer and employee representatives, and, on the PAC's recommendation, a presiding officer - each for a maximum of two terms of up to three years. Most PACs have nine members but can have as many as twenty-one. Provincial apprenticeship committees:

- Make recommendations to the board about:
    - standards and requirements for training and certification in their trade
    - courses and examinations in their trade
    - apprenticeship and certification
    - designation of trades and occupations
    - regulations and orders under the Apprenticeship and Industry Training Act
- monitor the activities of local apprenticeship committees in their trade
- determine whether training of various kinds is equivalent to training provided in an apprenticeship program in their trade
- promote apprenticeship programs and training and the pursuit of careers in their trade
- consult with other committees under the Apprenticeship and Industry Training Act about apprenticeship programs, training and certification and facilitate cooperation between different trades and occupations
- consult with organizations, associations and people who have an interest in their trade and with employers and employees in their trade
- may participate in resolving certain disagreements between employers and employees
- carry out functions assigned by the board

Cabinetmaker PAC Members at the Time of Publication

Mr. E. Salzgeber	Calgary	Presiding Officer
Mr. R. Horne	Calgary	Employer
Mr. P. Kowalski	Calgary	Employer
Mr. P. Mickelson	Calgary	Employer
Mr. F. Franz	Edmonton	Employer
Mr. P. Seerden	Edmonton	Employer
Mr. F. Van Hell	Lethbridge	Employer
Mr. S. Crews	Calgary	Employee
Ms. F. Lemoine	Edmonton	Employee
Mr. T. Slaunwhite	Edmonton	Employee
Mr. L. Boothman	Edmonton	Employee
Mr. T. Mizzaro	Grande Prairie	Employee
Mr. T. Harris	Lethbridge	Employee

Alberta Government

Alberta Advanced Education and Technology works with industry, employer and employee organizations and technical training providers to:

- facilitate industry's development and maintenance of training and certification standards
- provide registration and counselling services to apprentices and employers
- coordinate technical training in collaboration with training providers
- certify apprentices and others who meet industry standards

Technical Institutes and Colleges

The technical institutes and colleges are key participants in Alberta's apprenticeship and industry training system. They work with the board, industry committees and Alberta Advanced Education and Technology to enhance access and responsiveness to industry needs through the delivery of the technical training component of apprenticeship programs. They develop lesson plans from the course outlines established by industry and provide technical training to apprentices.

Apprenticeship Safety

Safe working procedures and conditions, incident/injury prevention, and the preservation of health are of primary importance in apprenticeship programs in Alberta. These responsibilities are shared and require the joint efforts of government, employers, employees, apprentices and the public. Therefore, it is imperative that all parties are aware of circumstances that may lead to injury or harm.

Safe learning experiences and healthy environments can be created by controlling the variables and behaviours that may contribute to or cause an incident or injury. By practicing a safe and healthy attitude, everyone can enjoy the benefit of an incident and injury free environment.

Alberta Apprenticeship and Industry Training Board Safety Policy

The Alberta Apprenticeship and Industry Training Board fully supports safe learning and working environments and encourages the teaching of proper safety procedures both within trade specific training and in the workplace.

Trade specific safety training is an integral component of technical training, while ongoing or general non-trade specific safety training remains the responsibility of the employer and the employee as required under workplace health and safety legislation.

Workplace Responsibilities

The employer is responsible for:

- training employees and apprentices in the safe use and operation of equipment
- providing and maintaining safety equipment, protective devices and clothing
- enforcing safe working procedures
- providing safeguards for machinery, equipment and tools
- observing all accident prevention regulations

The employee and apprentice are responsible for:

- working in accordance with the safety regulations pertaining to the job environment
- working in such a way as not to endanger themselves, fellow employees or apprentices

Workplace Health and Safety

A tradesperson is often exposed to more hazards than any other person in the work force and therefore should be familiar with and apply the Occupational Health and Safety Act, Regulations and Code when dealing with personal safety and the special safety rules that apply to all daily tasks.

Workplace Health and Safety (Alberta Employment, Immigration and Industry) conducts periodic inspections of workplaces to ensure that safety regulations for industry are being observed.

Additional information is available at www.worksafely.org

Technical Training

Apprenticeship technical training is delivered by the technical institutes and many colleges in the public post-secondary system throughout Alberta. The colleges and institutes are committed to delivering the technical training component of Alberta apprenticeship programs in a safe, efficient and effective manner. All training providers place great emphasis on safe technical practices that complement safe workplace practices and help to develop a skilled, safe workforce.

The following institutions deliver Cabinetmaker apprenticeship technical training:

Northern Alberta Institute of Technology Southern Alberta Institute of Technology

Procedures for Recommending Revisions to the Course Outline

Advanced Education and Technology has prepared this course outline in partnership with the Cabinetmaker Provincial Apprenticeship Committee.

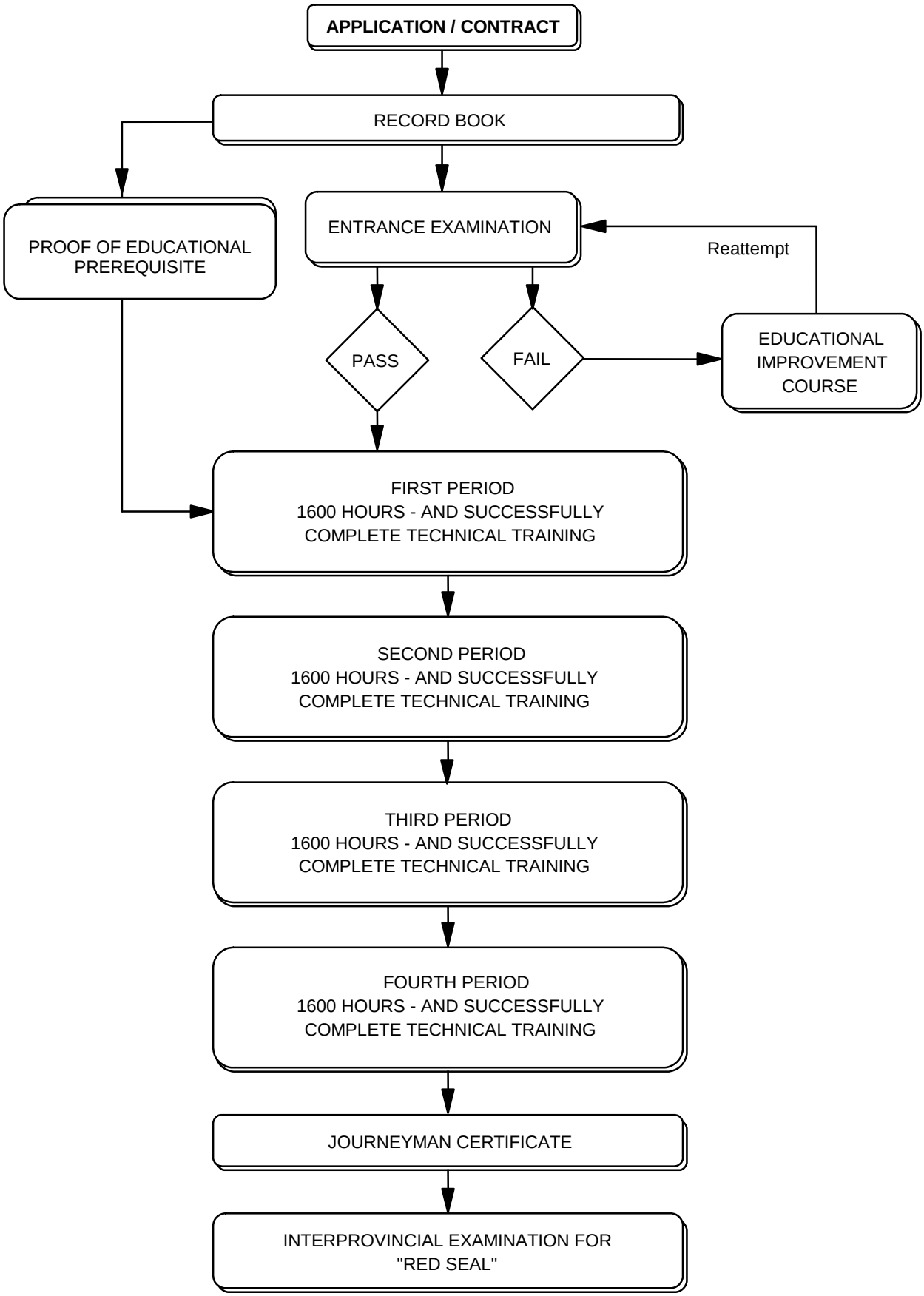
This course outline was approved on June 27, 2003 by the Alberta Apprenticeship and Industry Training Board on a recommendation from the Provincial Apprenticeship Committee. The valuable input provided by representatives of industry and the institutions that provide the technical training is acknowledged.

Any concerned individual or group in the province of Alberta may make recommendations for change by writing to:

Cabinetmaker Provincial Apprenticeship Committee
c/o Industry Programs and Standards
Apprenticeship and Industry Training
Advanced Education and Technology
10th floor, Commerce Place
10155 102 Street NW
Edmonton AB T5J 4L5

It is requested that recommendations for change refer to specific areas and state references used. Recommendations for change will be placed on the agenda for regular meetings of the Cabinetmaker Provincial Apprenticeship Committee.

Apprenticeship Route toward Certification



Cabinetmaker Training Profile
First Period
(8 Weeks 30 Hours per Week – Total of 240 Hours)

SECTION ONE

THEORY — **56 HOURS**

A	B	C
Registrations and Introductions — 6 Hours	Materials — 17 Hours	Hand Tools — 6 Hours
D	**E**	**F**
Machines and Equipment — 14 Hours	Safety — 4 Hours	Joints for Fabrications — 9 Hours

SECTION TWO

SHOP — **120 HOURS**

A	B	C
Hand Tools — 26 Hours	Fasteners and Adhesives — 15 Hours	Machines and Equipment — 39 Hours
D	**E**	
Fabrication and Assembly — 34 Hours	Explosive Actuated Tools Course — 6 Hours	

SECTION THREE

SHOP DRAWING — **40 HOURS**

A	B
Introduction — 34 Hours	Orientation to Computers — 6 Hours

SECTION FOUR

TRADE MATHEMATICS — **24 HOURS**

A
Basic Operations — 24 Hours

Second Period
(8 Weeks 30 Hours per Week – Total of 240 Hours)

SECTION ONE

THEORY — **56 HOURS**

A	B	C
Registration and Review — 6 Hours	Materials — 3 Hours	Machines and Equipment — 18 Hours
D	**E**	**F**
Laminating Procedures — 5 Hours	Hardware — 5 Hours	Machining and Assembly Practices — 10 Hours
G	**H**	
Doors and Frames — 2 Hours	Wood Finishing — 7 Hours	

SECTION TWO

SHOP — **120 HOURS**

A	B	C
Machines and Equipment — 38 Hours	Machine and Assembly Practices — 68 Hours	Wood Finishing — 10 Hours
D		
Safety — 4 Hours		

SECTION THREE

SHOP DRAWING

40 HOURS

A	B	C
Review 4 Hours	Blueprint Interpretation 10 Hours	Development of Production Drawings 20 Hours

D
Develop Computer Skills for Cabinetmakers 6 Hours

SECTION FOUR

TRADE MATHEMATICS

24 HOURS

A	B
Review	Practical Trade Calculations

Third Period
(8 Weeks 30 Hours per Week – Total of 240 Hours)

SECTION ONE

THEORY

56 HOURS

A	B	C
Registration and Review 6 Hours	Materials 7 Hours	Packaging and Shipping 2 Hours

D	E	F
Principles of Design and Layouts with Emphasis on Machining and Assemble Practices 19 Hours	Machines and Equipment 14 Hours	Stairs 6 Hours

G
Safety 2 Hours

SECTION TWO

SHOP

120 HOURS

A	B	C
Materials (Selected Assignments or Demonstrations with Materials Listed in Third Period Theory) 4 Hours	Machines and Equipment 36 Hours	Layout, Machine Assembly Practice 70 Hours

D
Wood Finishing 10 Hours

SECTION THREE

SHOP DRAWING

40 HOURS

A	B	C
Blueprints for a Commercial Type Building 12 Hours	Drawings 20 Hours	Intermediate Computer Drawing Skills 8 Hours

SECTION FOUR

TRADE MATHEMATICS

24 HOURS

A
Assignments Related to Course Content Outlines in Theory, Shop and Shop Drawing Sections 24 Hours

Fourth Period
(8 Weeks 30 Hours per Week – Total of 240 Hours)

SECTION ONE	**A**	**B**	**C**	
THEORY **56 HOURS**	Registration and Review 6 Hours	Train The Trainer 3 Hours	Related Trade and Industry Practices 30 Hours	
	D	**E**	**F**	
	Industry Practices 6 Hours	Installation Procedures 2 Hours	Wood Finishing 9 Hours	
SECTION TWO	**A**	**B**	**C**	
SHOP **120 HOURS**	Machining and Assembling 65 Hours	Wood Finishing 10 Hours	Practical Examination 45 Hours	
SECTION THREE	**A**	**B**	**C**	
SHOP DRAWING **40 HOURS**	A Comprehensive Review of Blueprints and Drawings Typically Encountered in the Cabinetmaker Trade 5 Hours	Shop Drawings 25 Hours	Computer Drawing Applications 10 Hours	
SECTION FOUR	**A**			
TRADE MATHEMATICS **24 HOURS**	Assignments Related to Course Content Outlined in Theory, Shop and Shop Drawing Sections 24 Hours			

NOTE: The hours stated are for guidance and should be adhered to as closely as possible. However, adjustments must be made for rate of apprentice learning, statutory holidays, registration and examinations for the training establishment and Apprenticeship and Industry Training.

FIRST PERIOD TECHNICAL TRAINING
CABINETMAKER TRADE
COURSE OUTLINE

UPON SUCCESSFUL COMPLETION OF THIS PROGRAM THE APPRENTICE SHOULD BE ABLE TO PERFORM THE FOLLOWING OUTCOMES AND OBJECTIVES.

SECTION ONE: ..... THEORY ..... 56 HOURS

A. Registration and Introductions.....6 Hours

Outcome: ***Upon completion of this section, the apprentice will understand the training institutions' expectations during training, trade history, expectations while attending technical training, the liaison process and study methods.***

1. State attendance requirements.
2. Identify the location and describe the responsibilities of the liaison officer.
3. Outline standards for behaviour.
4. Identify study methods.
5. Identify study references.
6. Outline history of the Cabinetmaker trade.
7. Describe relationship of journeyperson to trainee.
8. Outline the scope of trade for a Cabinetmaker.
9. Define trade terms.
10. Identify trade areas:
    a) commercial
    b) institutional
    c) residential
    d) furniture

B. Materials.....17 Hours

Outcome: ***Upon completion of this section, the apprentice will be able to classify different woods, understand structure and growth patterns, grading and seasoning requirements as well as manufactured wood products, plastic sheet materials and identify the varied types of fasteners.***

1. Identify and describe the nature and properties of wood:
    a) deciduous and conifers
    b) physical properties
    c) working properties
2. Describe cutting, drying, grading and storing of hard and softwood lumber.
3. Identify and describe materials and manufacturer's defects in wood, including common defects and flaws related to growth and machining.
4. Identify and describe the standard mouldings and millwork products, including mouldings and millwork profiles.

5. Describe the manufacturing process of veneer:
   a) different types of cuts
   b) storage and handling
   c) cost and waste
6. Compare and describe the manufacturing of panel products:
   a) core types
   b) grading
   c) working properties
7. Identify and describe plastic laminates, melamine and acrylics:
   a) manufacturing
   b) grades
   c) core types
   d) surface finishes
   e) working properties
8. Identify and describe adhesives:
   a) types
   b) working properties
   c) applications
9. Identify and describe the different types of fasteners:
   a) corrugated
   b) staples and nails
   c) head/crown shapes
   d) coatings
   e) knockdown fittings
10. Identify and describe coated abrasives:
    a) types (sheet and belt)
    b) working properties
    c) grit-sizes
    d) application

C. Hand Tools.....6 Hours

Outcome: ***Upon completion of this section, the apprentice will be able to list and describe the typical hand tools used in the cabinetmaker trade.***

1. Identify and describe the typical tools used in the cabinetmaker trade:
   a) measuring, layout, and alignment tools
   b) squaring and marking tools
   c) cutting tools (edge and tooth)
   d) boring and drilling tools
   e) assembly and dismantling tools
   f) clamping tools
   g) abrasives and scraping tools
   h) sharpening and conditioning procedures
   i) maintenance of tools

D. Machines and Equipment.....14 Hours

Outcome: ***Upon completion of this section, the apprentice will be able to describe the safe operation, application and regular maintenance of all powered hand tools, pneumatic tools and fastening devices including compressors, stationery power machines, tooling, jigs and accessories.***

1. Identify and describe the safe operation, application and regular maintenance of powered hand tools:
   a) power drills and screw guns
   b) circular saws
   c) jigsaw, reciprocating and scroll saws
   d) portable power planes
   e) power routers
   f) sanders
   g) mitre saws
   h) plate jointers
2. Identify and describe the safe operation, application and regular maintenance of pneumatic tools and fasteners:
   a) portable power tools
   b) clamping and assembly
   c) vacuum tables
   d) nailing and stapling equipment
3. Identify and describe maintenance procedures for compressors and pneumatic powered equipment:
   a) moisture extraction and drying
   b) power connections
   c) safety concerns
4. Identify and describe the safe operation, application and regular maintenance for the following stationary power machines, including tooling, jigs and accessories:
   a) table/panel saws
   b) jointers
   c) thickness planers
   d) boring machines
   e) radial arm saws
   f) dovetailers
   g) band saws
   h) stationary sanders
   i) guards

E. Safety .....4 Hours

Outcome: ***Upon completion of this section, the apprentice will be able to identify and describe electrical theory, O.H.S. Regulations and problems associated with hearing loss and conservation, health hazards, fire prevention and W.H.M.I.S.***

1. Identify and describe electrical theory:
   a) single and three phase connections
   b) voltages and amperages
   c) safe use and care of extension cords
   d) areas and conditions where it is unsafe to use electrical equipment
   e) signs of overload in motors

f) procedures to take when a motor overheats, smokes or goes on fire
g) care and maintenance of electrical equipment

2. Identify the Occupational Health and Safety Regulations as they apply to the safe work practices in the cabinetmaker trade with emphasis on:

a) responsibility of employer and employee
b) housekeeping
c) accident prevention
d) emergency procedures
e) personal protective equipment
f) selected safety precautions for machinery
g) use of ladders and scaffolds

3. Describe industrial hearing loss and conservation:

a) noise and induced hearing loss

4. Describe potential industrial health hazards for:

a) skin and respiratory protection
b) gases, vapours, fumes, dust masks and breathing apparatus
c) air quality (ventilation)
d) compressed air hazards

5. Identify and describe fire prevention and controls:

a) types of fires by class and correct equipment is used for fire control
b) hazardous areas (finishing rooms)
c) how to prevent fires

6. Describe Workplace Hazardous Materials Information System (W.H.M.I.S.) its rational and major elements:

a) distinguish labels between supplier and workplace
b) prohibited products
c) restricted products
d) controlled products
e) material Safety Data Sheet, its purpose and limitations
f) responsibility of employer, supplier and worker

F. Joints for Fabrication .....9 Hours

Outcome: ***Upon completion of this section, the apprentice will be able to identify and describe the principles of wood joinery, forces affecting joints and the different types of joints used in cabinetmaking.***

1. Describe the principles involved in joining wood.
2. Identify and describe the different forces affecting joints.
3. List the basic woodworking joints in the Cabinetmaker trade:

a) butt
b) mitre
c) lap joints
d) dado
e) rabbet joint
f) dowel joint
g) tongue and groove joints
h) spline joints

i) mortise and tenon joints
j) dovetail joints
k) biscuit or plate joint
l) coped joint

4. Describe woodworking joints relative to:

a) strength
b) suitability
c) applications
d) material

5. Describe the most practical joints for a particular application.

SECTION TWO: .....SHOP.....120 HOURS

A. Hand Tools.....26 Hours

Outcome: ***Upon completion of this section, the apprentice will demonstrate an ability to complete projects as assigned within the timelines using handtools previously identified in theory, demonstrate competency in maintaining and storing handtools.***

1. Demonstrate an ability to complete exercises and projects in accordance with the theory previously taught.
2. Demonstrate safe working procedures when using hand tools.
3. Use all hand tools competently and demonstrate an ability to work with:

a) solid woods and plywoods
b) layout and fitting of joints

4. Maintain all hand tools in top condition and demonstrate reasonable skill in all sharpening procedures.
5. Demonstrate knowledge in the proper storage of hand tools.

B. Fasteners and Adhesives.....15 Hours0

Outcome: ***Upon completion of this section, the apprentice will demonstrate an ability to mix and use adhesives, prepare surfaces to desired conditions, apply correct pressure to joints using clamps, maintain gluing equipment and use proper fastening devices.***

1. Demonstrate an ability to complete exercises using adhesives.
2. Demonstrate an ability to correctly mix adhesives with regards to:

a) viscosity
b) time limits for usage

3. Prepare wood surfaces to the desired conditions for gluing.
4. Demonstrate an ability to correctly apply adhesives using the most common and appropriate method:

a) brushes
b) rollers
c) bottles
d) spraying
e) spreader

5. Demonstrate an ability to apply the required pressures to glue joints.

6. Demonstrate an ability to square projects using clamps.
7. Demonstrate an ability to glue up solid lumber.
8. Maintain tools and gluing equipment:
   a) demonstrate an ability for cleaning and storing tools and equipment
   b) use of solvents and cleaning solutions
9. Remove excess glue from projects following a lay-up period.
10. Demonstrate an ability to select and use nails, screws and fastening tools for selected projects.
11. Demonstrate an ability to drill holes in wood using:
    a) pilot hole
    b) shank hole
    c) clearance hole
    d) counterbores
    e) plug cutters
    f) countersinks
    g) pocket hole
12. Select the correct staples and pins for selected projects.
13. Use the different types of staples and pins using:
    a) portable pneumatic nailer
    b) hand-operated stapling tool

C. Machines and Equipment.....39 Hours

Outcome: ***Upon completion of this section, the apprentice will be able to use power equipment for selected projects, use different woods and manufactured materials and adhere to safety and maintenance requirements according to O.H.S and manufacturers recommendations.***

1. Demonstrate the safe operation of power equipment.
2. Use extensions and accessories in developing cabinetmaker projects using:
   a) fixed and adjustable jigs
   b) taper cutting
   c) wedges
   d) temporary fences and stops
3. Select the different and correct machines used to develop assigned projects.
4. Develop projects using different woods and manufactured materials:
   a) solid and manufactured material
   b) owed, cupped or warped materials
5. Demonstrate an ability to use materials effectively and economically.
6. Demonstrate an ability to prevent flaws in materials in relation to:
   a) improper settings
   b) dull edges
   c) poor alignments resulting in skips, burns, snipes and raised grains
7. Develop maintenance procedures.

8. Adhere to maintenance procedures according to shop requirements, O.H. & S. Regulations and manufacturer's recommendations:

    a) cable connections, belt conditions and tensions
    b) lubrication and cleaning
    c) touch-up, honing and sharpening

D. Fabrication and Assembly .....34 Hours

Outcome: ***Upon completion of this section, the apprentice will be able to build selected projects from solid woods and manufactured material; develop and interpret basic shop drawings and simple layouts; fabricate various components; develop and fit joints; develop proper assembly procedures using adhesives and equipment; prepare projects for finishing.***

1. Build selected projects from solid woods and manufactured materials.
2. Display an ability to develop and interpret basic shop drawings and simple layouts.
3. Fabricate various components to various sizes.
4. Develop and fit joints to a high standard of accuracy using:

    a) hand tools
    b) power tools

5. Demonstrate an understanding of proper assembly procedures using:

    a) adhesives
    b) clamps
    c) assorted fasteners

6. Clean-up projects, ready to accept finishes.

E. Explosive Actuated Tools Course.....6 Hours

Outcome: ***Upon completion of this section, the apprentice will demonstrate the use of low velocity fastening equipment; responsibility as operator; servicing of equipment.***

1. Course will provide instruction in:

    a) safety
    b) uses and applications
    c) care, maintenance and operation
    d) practical experience in firing

2. Describe and define high velocity and low velocity tools and their operation. Be aware of the safety features and the different types of fasteners and charges. Learn the safety codes and regulations. State causes of misfire.
3. Identify the operator's responsibility. Demonstrate safe operation. Explain the relationships between pins, charges and materials. Discuss the hidden features of fastening surfaces.
4. Demonstrate servicing and safe storage of tools and supplies. Demonstrate minimum service of all common tools. Learn proper and safe storage of tools and charges and the disposal of misfired charges.
5. Demonstrate operation and the actual firing of a high velocity and a low velocity tool.
6. Operate—take part in both the pre-firing routine and fire both high velocity and low velocity explosive actuated type.
7. Prove proficiency upon successful completion of test and course.

SECTION THREE: .....SHOP DRAWING.....40 HOURS

A. Introduction .....34 Hours

Outcome: ***Upon completion of this section, the apprentice will demonstrate ability to hand draw all views and details using standard shop drawing equipment.***

1. Describe the principle of orthographic projection and correctly draw plan, elevation, side and sectional views of simple objects.
2. Describe the principle of isometric projection and correctly draw isometric views of simple objects.
3. Differentiate between the following types of lines: object, hidden, extension, dimension, centre, break, and cutting plane-lines.
4. Draw the common cross-sectional symbols for the standard materials used in working drawings for light construction and shop drawings for the cabinet shop.
5. Demonstrate an understanding of basic applied geometry by constructing angles, dividing lines, constructing circles, tangents and constructing regular polygons.
6. Produce simple drawings, using a T-square, set-square and incorporate the different types of lines.
7. Measure accurately, using scale-ruler.
8. Draw numbers and upper case letters neatly for the purpose of labelling and dimensioning drawings.
9. Correctly interpret typical working drawings of residential buildings and differentiate the related trade symbols.
10. Measure working drawings, using appropriate scales.
11. Produce quick freehand drawings of simple objects, using the principles of working drawings.
12. Produce plans—elevation, cross-sectional, and detailed views—for all projects to be built in the shop.

B. Orientation to Computers .....6 Hours

Outcome: ***Upon completion of this section, the apprentice will demonstrate the ability to use CAD.***

1. Demonstrate hands-on skills using CAD.
2. Use CAD for simple joints.

SECTION FOUR: .....TRADE MATHEMATICS.....24 HOURS

A. Basic Operations .....24 Hours

Outcome: ***Upon completion of this section, the apprentice will demonstrate ability in trade related mathematics.***

1. Demonstrate an ability to solve work related problems using basic math.
2. Show competence in using a calculator with basic functions.
3. Demonstrate an ability to solve problems using two and three-dimensional geometry.
4. Demonstrate an ability to solve problems involving ratio, proportion and percent.
5. Develop basic cutting lists from shop drawings.
6. Use the metric and imperial systems of measurement.

SECOND PERIOD TECHNICAL TRAINING
CABINETMAKER TRADE
COURSE OUTLINE

UPON SUCCESSFUL COMPLETION OF THIS PROGRAM THE APPRENTICE SHOULD BE ABLE TO PERFORM THE FOLLOWING OUTCOMES AND OBJECTIVES.

SECTION ONE:.....THEORY ..... 56 HOURS

A. Registration and Review.....6 Hours

Outcome: ***Upon completion of this section, the apprentice will recall the principles of cabinetmaking taught in the first period.***

1. Brief re-introduction of first year materials, equipment and procedures.

B. Materials .....3 Hours

Outcome: ***Upon completion of this section, the apprentice will be able to identify the characteristics and application of adhesives.***

1. Describe the characteristics of thermoplastic and thermosetting in terms of:
   a) preparation, application, setting speed and strength
   b) hide glue, casein glue, standard and cross-linking polyvinyl resins, urea-resin
   c) resorcinol, epoxy, contact cements and hot-melts
   d) mastics
2. Identify and describe the most suitable adhesive for specific applications in terms of:
   a) shelf-life, pot-life
   b) assembly times
   c) moisture conditions, temperatures
   d) undesirable staining of materials
   e) colouring of glue
   f) type of material to be glued
   g) moisture content

C. Machines and Equipment .....18 Hours

Outcome: ***On completion of this section the apprentice will be able to list and describe the procedures for making mortises and tenons; identify various saws and gluing equipment, presses, power clamping devices, computer operated machinery, power fed systems, pressure requirements and specialized profiling equipment.***

1. List and describe set up procedures for making mortise and tenons.
2. Identify various types of saws and their applications.
3. Identify the various types of gluing equipment and their applications.
4. Identify various types of presses and power clamping devices and their applications.
5. Identify the various types of computer-operated machinery and their uses.
6. Identify various types of power feed systems and their applications.
7. Describe various pneumatic systems including typical pressure requirements, special safety precautions and common air tools.
8. Describe and list specialized profiling equipment.

D. Laminating Procedures.....5 Hours

Outcome: ***Upon completion of this section, the apprentice will be able to will be able to identify properties and application of laminates.***

1. Identify the different types, properties and applications of laminates including plastic, solid surface and acrylics:
   a) grades
   b) finishes
   c) sizes
   d) specialties (solid core and acid resistant)
2. Describe the procedures for selecting materials, adhesives, assembly and clamping systems.

E. Hardware .....5 Hours

Outcome: ***Upon completion of this section, the apprentice will be able to list and describe the different types of hardware for all types of millwork installation.***

1. List the types and applications of cabinet, architectural and millwork hardware.

F. Machining and Assembly Practices .....10 Hours

Outcome: ***Upon completion of this section, the apprentice will be able to describe the fabrication, shipping and installation of casework.***

1. Plan the fabrication of casework, considering size and ease of installation.
2. Describe the criteria used for selecting and using solid stock and sheet materials.
3. Compare and contrast custom and mass production situations.

G. Doors and Frames .....2 Hours

Outcome: ***Upon completion of this section, the apprentice will be able to list and describe the different types of doors, frames and hardware installations.***

1. Describe the types, manufacturers, hardware and installation of doors and frames.

H. Wood Finishing.....7 Hours

Outcome: ***Upon completion of this section, the apprentice will be able to describe preparation, products, techniques and equipment used for wood finishing.***

1. Describe how wood products are prepared for finishing.
2. Describe the products, processes and safety issues that apply to wood finishing.
3. Describe the techniques and equipment used for wood finishing.

SECTION TWO: ..... SHOP..... 120 HOURS

Upon completion of this unit, the successful apprentice will have had instruction and demonstrations as well as practice in building projects appropriate for this level and will be able to perform the following tasks. Further, the apprentice will take part in a class demonstration.

A. Machines and Equipment ..... 38 Hours

Outcome: ***Upon completion of this section, the apprentice will be able to demonstrate an ability to set up and use machinery previously taught in theory; apply safety regulations according to Occupational Health and Safety requirements.***

1. Demonstrate an ability to safely set-up and use machines and equipment previously taught in theory.
2. Know the Occupational Health and Safety Regulations relevant to all power equipment and tools previously taught in theory.
3. Demonstrate flexibility in participating in various types of work:
   a) material break-out and planning
   b) profiling and fluting
   c) dovetailing, dowel work, mortise and tenon
   d) sanding procedures

B. Machine and Assembly Practices ..... 68 Hours

Outcome: ***Upon completion of this section, the apprentice will be able to demonstrate an ability to manufacture casework from start to finish using current trade practices.***

1. Demonstrate an ability to develop:
   a) open casework
   b) casework with doors and drawers (i.e. kitchen cabinets)
2. Select correct materials, choose proper graining and glues for specified projects:
   a) minimize cupping and warping
   b) machining and sizing considerations
   c) shrinkage
3. Develop a layout rod for a set of upper and lower kitchen cabinets according to:
   a) given sizes;
   b) specifications;
   c) standard height requirements (upper and lower cabinets);
   d) standard location;
   e) space requirements (appliances, fixtures)
4. Understand the forces and loads of finished projects and allow for trouble free installations by providing the:
   a) necessary joints
   b) supports
   c) backings and rails
   d) scribes
5. Develop a materials list from the -layout rod and the working drawings.
6. Cut-up sheet materials with a minimum of waste (plywood, particleboard, fibreboard, melamine overlays, plastic laminates).
7. Break-out solid hardwood materials required for:
   a) stiles and rails
   b) panels
   c) edgings

8. Machine millwork to acceptable standards using the various machines best suited for:
   a) rabbets
   b) dadoes
   c) profiles
   d) copes – mitres
   e) dowels - biscuits and plates
9. Develop projects using:
   a) jigs
   b) templates
   c) stops
10. Demonstrate gluing and assembling procedures:
   a) strengths of finished joints
   b) sanding
   c) clean-up of non-parallel joints
   d) inlays
11. Assemble different case units using:
   a) drawers
   b) drawer guides
   c) cabinet doors
   d) profiling
   e) edging
   f) door hardware
   g) shelf supports
   h) specialty hardware
   i) catches
   j) installation
   k) plastic laminates
   l) glue
   m) nailers and staples
   n) screws
   o) dowels, biscuits and plates
12. Demonstrate an ability to glue products.
13. Complete assignments relative to bending wood.
14. Demonstrate an ability to apply plastics to curved surfaces.

C. Wood Finishing.....10 Hours

Outcome: ***Upon completion of this section, the apprentice will demonstrate proper finishing techniques.***

1. Demonstrate an ability to prepare selected projects previous to applying finishing coat/s.
2. Establish finishing process required to achieve desired appearance and performance.
3. Demonstrate ability to select and apply stain.
4. Demonstrate an ability to apply seal and wash-coats.
5. Demonstrate ability to select and apply topcoats.
6. Demonstrate an ability use and maintain different types of spray equipment.

D. Safety ..... 4 Hours

Outcome: ***Upon completion of this section, the apprentice will demonstrate ability to apply safety in all facets of the cabinetmaker trade while using spraying equipment and demonstrate knowledge in using equipment, clothing, and disposal methods.***

1. Demonstrate an awareness of the harmful effects of vapours from solvents and how to protect against them:
   a) ventilation requirements
   b) breathing apparatus conventional spray equipment
2. Demonstrate the requirements for protective clothing (e.g. for bleaching in accordance to O.H. & S. and (WHMIS).
3. Demonstrate safe disposal methods for potentially dangerous or harmful materials:
   a) oily rags
   b) used solvent, etc.

SECTION THREE: ..... SHOP DRAWING ..... 40 HOURS

A. Review ..... 4 Hours

Outcome: ***Upon completion of this section, the apprentice will be able to recall first period technical training.***

1. Recall subject matter typical of first period training.

B. Blueprint Interpretation ..... 10 Hours

Outcome: ***Upon completion of this section, the apprentice will be able to interpret blueprints, specifications and catalogues.***

1. Demonstrate an ability to interpret residential and commercial blueprints for:
   a) plans, elevations and section views
   b) room finish schedules
   c) cabinets, casework and furniture details
2. Demonstrate an ability to interpret specifications and catalogues with regards to:
   a) codes
   b) industry standards and practices
   c) specifications
   d) catalogues and brochures

C. Development of Production Drawings ..... 20 Hours

Outcome: ***Develop freehand sketches, shop drawings, material lists, etc.***

1. Demonstrate an ability to develop freehand sketches details, joints, and layouts.
2. Demonstrate an ability to produce shop drawings for:
   a) plans, elevations and section views
   b) layout drawings
   c) rods and patterns

3. Demonstrate an ability to develop:
    a) material lists
    b) cutting layout
    c) hardware type and quantity lists

D. Develop Computer Skills for Cabinetmakers ..... 6 Hours

Outcome: ***Upon completion of this section, the apprentice will be able to develop shop drawings using CAD.***

1. Use CAD to develop shop drawings.

SECTION FOUR: ..... TRADE MATHEMATICS..... 24 HOURS

This section of training is designed to permit the apprentice to partake in remedial or accelerated exercises at the discretion of instructors. Exercises will relate to the course content outlined in blueprint, shop and theory sections.

A. Review

Outcome: ***Upon completion of this section, the apprentice will be able to recall and apply problem solving from first period.***

1. Display competency in solving typical first period math problems.

B. Practical Trade Calculations

Outcome: ***Upon completion of this section, the apprentice will demonstrate an ability to perform calculations from shop drawings; estimate area, volume and capacity measurements, ratio and proportion as well as developing material lists from drawings and calculating materials.***

1. Demonstrate an ability to perform calculations utilizing shop drawings for:
    a) linear measurement of equal size
    b) similar components within a shop project
    c) totals required for number of units to be manufactured
2. Demonstrate an ability to estimate area measurements relative to the:
    a) total surface area of materials of equal thickness within a unit
    b) number of sheets of materials to build required number of units to be manufactured
    c) cost/gross and cost/units of materials
3. Demonstrate an ability to estimate volume and capacity measurements of material for required shop projects relative to the:
    a) volume measure of solid wood components per units and total requirement for gross unit to be manufactured (SI and Imperial units)
    b) volume space required to store/ship units after assembling
    c) material cost of shop projects
    d) from shop drawing calculation of glue, mechanical fasteners and finishing material (oil, paint, etc.) required for assembly

4. Demonstrate an ability to apply ratio and proportion to:

   a) pulley ratio and cutting speeds of saws, lathe and drill press
   b) feed speeds of planers and shapers
   c) mixing proportion of glue, paint, etc. for job
   d) percentage waste of material due to layout, pattern matching and cutting operations
   e) force and pressure requirements for gluing operations, clamps and presses

5. Demonstrate an ability to:

   a) make up cutting list from shop drawings
   b) calculate material for a production run

THIRD PERIOD TECHNICAL TRAINING
CABINETMAKER TRADE
COURSE OUTLINE

UPON SUCCESSFUL COMPLETION OF THIS PROGRAM THE APPRENTICE SHOULD BE ABLE TO PERFORM THE FOLLOWING OUTCOMES AND OBJECTIVES.

SECTION ONE:.....THEORY ..... 56 HOURS

A. Registration and Review.....6 Hours

Outcome: ***Upon completion of this section, the apprentice will be able to recall and understand the principles of cabinetmaking taught in first and second period.***

1. Review subject matter previously covered in the first and second periods.

B. Materials .....7 Hours

Outcome: ***Upon completion of this section, the apprentice will be able to Identify and describe lumber grading systems; different types of glass, metals and plastics; thermal and acoustic insulation.***

1. Describe the basis for the hardwood standard grading system.
2. List and describe types and basic procedures of glass.
3. List and describe the use of metals and plastics in conjunction with woodworking.
4. Thermal and acoustic insulation.

C. Packaging and Shipping.....2 Hours

Outcome: ***Upon completion of this section, the apprentice will be able to Identify and describe proper packaging and shipping procedures.***

1. Describe preparation procedures for shipments from shop.
2. Identify the common causes of damage to units in transit or storage.

D. Principles of Design and Layouts With Emphasis on Machining and Assembly Practices .....19 Hours

Outcome: ***Upon completion of this section, the apprentice will be able to describe principles of design, ergonomics, production; veneering, joinery, and hardware.***

1. Describe principles and elements of design.
2. Describe the principles of ergonomics.
3. Describe the sequence of production contrasting custom and production shops.
4. Describe the materials, procedures and equipment used in veneering.
5. Describe advanced architectural joinery and hardware for case frames and doors.
6. Identify and describe the different styles of furniture.
7. Introduce A.C.T.S. trade definition.
8. Describe architectural wall and ceiling treatments.

E. Machines and Equipment ..... 14 Hours

Outcome: ***Upon completion of this section, the apprentice will be able to describe the setup of all machines as well as the maintenance for related tools, jigs and accessories.***

1. Describe set-up and machining methods regarding solid woods and sheet goods.
2. Discuss the safe set-up, operations and maintenance for all related tools and accessories:
   a) shaper
   b) moulder
   c) multiple spindle boring machine
   d) mortising and tenoning machines
   e) dovetailer

F. Stairs ..... 6 Hours

Outcome: ***Upon completion of this section, the apprentice will be able to describe the design and manufacturing of various types of stairs, guards, and railings in accordance to Code.***

1. Describe the design and manufacturing of various types of stairs, guards, and railings in accordance to the National Building Code.

G. Safety ..... 2 Hours

Outcome: ***Upon completion of this section, the apprentice will be able to identify and describe all areas of safety including health hazards, inspections and employer/employee responsibilities.***

1. Describe safety with emphasis on:
   a) safety committees; structure and responsibilities
   b) industrial health hazards and illnesses
   c) inspections
   d) individual responsibilities
   e) cost of unsafe work habits

SECTION TWO: ..... SHOP ..... 120 HOURS

Shop operations will relate to items outlined in theory sections. Safety regulations will be observed.

A. Materials (Selected Assignments or Demonstrations With Materials Listed in Third Period Theory) ..... 4 Hours

Outcome: ***Upon completion of this section, the apprentice will demonstrate the ability to work with glass and plastic sheet materials.***

1. Demonstrate an ability to use, cut and ease edges on the common types of glass.
2. Demonstrate an ability to use cut, shape and ease edges when using plastic sheet materials.

B. Machines and Equipment ..... 36 Hours

Outcome: ***Upon completion of this section, the apprentice will demonstrate the ability to set up and use machines and equipment relevant to projects.***

1. Select projects or exercises that incorporate advanced set-up and use of machines and equipment relevant to:
   a) shapers
   b) mortisers
   c) tenoners
   d) dovetailers
   e) routers (hand and overhead)
   f) presswork (veneering)
   g) circular saws
   h) jointers and planer saw
2. Build projects and perform operations that are related to the subject matter listed in theory to include:
   a) basic veneering
   b) tambour-door construction
   c) stair construction

C. Layout, Machine and Assembly Practice ..... 70 Hours

Outcome: ***Upon completion of this section, the apprentice will demonstrate an ability to select and develop projects to specifications and drawings; work in groups or carry out individual tasks; lay out stairs to specifications and build casework to reflect design principles.***

1. Select and develop projects according to specifications and drawings that encompass the scope of work.
2. Display an ability to perform individual tasks and the adaptability to work in pairs or groups as instructed by facilitators.
3. Demonstrate ability to layout stairs according to specifications and code.
4. Develop and assemble stairs to include:
   a) notched built up stringers
   b) housed and/or mitered stringers
   c) balustrade
5. Layout and build casework to reflect design and style principles:
   a) selection (wood)
   b) sizing of cores
   c) wood veneer applications
   d) various matchings
   e) frame and panel-units
   f) geometric shapes
   g) arched items
   h) wood bending
   i) laminating

D. Wood Finishing.....10 Hours

Outcome: ***Upon completion of this section, the apprentice will be able to demonstrate and participate in exercises that incorporate subject matter listed in second period theory.***

1. Demonstrate and participate in practical projects assigned.
2. Demonstrate an ability to complete projects within allotted times that reflect wood finishing procedures.
3. Demonstrate an ability to develop and complete projects requiring special customized treatments.

SECTION THREE: .....SHOP DRAWING ..... 40 HOURS

A. Blueprints for a Commercial Type Building .....12 Hours

Outcome: ***Upon completion of this section, the apprentice will be able to demonstrate an ability to interpret to all types of drawings.***

1. State the purpose and list the information that would normally be found on:
   a) architectural drawings
   b) structural drawings
   c) mechanical drawings
   d) electrical drawings
   e) shop drawings
2. Interpret and interrelate drawings to the degree necessary for cabinetmaker work.

B. Drawings.....20 Hours

Outcome: ***Upon completion of this section, the apprentice will be able to demonstrate the ability to draw freehand sketches and develop layouts.***

1. Practice freehand sketches.
2. Develop layouts of basic geometric shape.
3. Apply principle and elements of design in shop drawings.
4. Design an efficient kitchen-cabinet layout.
5. Use blueprints and specifications to produce shop drawings and sketches of typical millwork.
6. Lay out assorted types of stairs and stair components.

C. Intermediate Computer Drawing Skills .....8 Hours

Outcome: ***Upon completion of this section, the apprentice will be able to use computers to produce drawings and cutting lists.***

1. Demonstrate the ability to:
   a) complete a current year project drawing
   b) apply dimensioning
   c) create a cutting list-optimize on software
   d) Insert text block into drawings i.e. (cutting list, title block, etc.)
   e) learn how to merge a drawing and cutting list

SECTION FOUR: ..... TRADE MATHEMATICS..... 24 HOURS

A. Assignments Related to Course Content Outlined in Theory, Shop and Shop Drawing Sections .....24 Hours

Outcome: ***Upon completion of this section, the apprentice will be able to demonstrate knowledge in all areas related to trade math problem solving and blueprint take off.***

1. Display competency in solving typical second period math problems.
2. Perform quantity take-offs of millwork from working drawings of commercial buildings.
3. Calculate appropriate spacings of panel-work for ceilings and walls.
4. Display competency in using rise, run, unit rise, unit run, headroom clearance and slope in calculating all required dimensions in stair building.
5. Apply the relevant sections of the building code to stair calculations.
6. Convert basic and derived units of measure using both metric and imperial measuring systems.
7. Demonstrate an ability to estimate:
   a) costs of materials
   b) labour
   c) overhead
8. Calculate revolutions per minutes, feed speeds and rim-speeds for woodworking machines.

FOURTH PERIOD TECHNICAL TRAINING
CABINETMAKER TRADE
COURSE OUTLINE

UPON SUCCESSFUL COMPLETION OF THIS PROGRAM THE APPRENTICE SHOULD BE ABLE TO PERFORM THE FOLLOWING OUTCOMES AND OBJECTIVES.

SECTION ONE.....THEORY ..... 56 HOURS

A. Registration and Review.....6 Hours

Outcome: ***Upon completion of this section, the apprentice will be able to recall all previous theory content, overview of expectations and outcomes of fourth period training.***

1. Briefly review some areas of the first three periods and inform candidates of expectations during fourth period regarding:
   a) reference materials
   b) supplies
   c) final examinations
   d) in-class project
2. On completion of this section the apprentice will be able to pass a comprehensive review examination.

B. Train The Trainer: Workplace Coaching Skills & Advisory Network .....3 Hours

Outcome: ***Upon completion of this section, the apprentice will be able to identify appropriate methods used to coach apprentices.***

1. Describe the following coaching skills used for training apprentices:
   a) identify the point of the lesson
   b) link the lesson
   c) demonstrate a skill
   d) provide opportunity to practice a skill
   e) give feedback to the learner
   f) assess the learner's progress
2. Describe and explain the role and purpose of the advisory network and Provincial Apprenticeship Committee for the Cabinetmaker trade.

C. Related Trade and Industry Practices .....30 Hours

Outcome: ***Upon completion of this section, the apprentice will understand all components of related trades and industry practices.***

1. Demonstrate an ability to solve problems arising form special requirements of:
   a) churches
   b) courthouses
   c) lobbies and lounges
   d) food service fixtures

2. Describe some of the special requirements related to objective #1:
   a) pews
   b) oversized veneered panels
   c) large mouldings
   d) columns and arches
   e) ceiling treatments
3. Describe common materials and hardware used for food service fixtures, their machining and application.
4. Demonstrate knowledge of the standard construction methods for the different types of:
   a) cabinets
   b) tables
   c) chairs
5. Describe the development of curved and irregular components relative to:
   a) cutting
   b) routing
   c) shaping with patterns
6. Describe applicable jigs and templates.
7. Select veneer leafs in the proper order and arrangement for the various matchings.
8. Demonstrate a working knowledge of cutting and splicing veneer.
9. Show an understanding of the different types of adhesives used in veneering, and the application and loading process.
10. Select the proper pressure required in the veneer press and the most acceptable layout of pieces in the press.
11. Describe inlay work, inlaying of lines and bandings of wood and metals.
12. Describe the methods used in marquetry.
13. Name the basic carving tools, describe and demonstrate the correct sharpening procedures.
14. Show an understanding of how power tools are used for rough shaping.
15. Demonstrate knowledge of the procedure for carving:
   a) in the round (cabriole legs)
   b) chip carving
16. Describe flame spread rating and their application to the cabinetmaker trade.
17. Describe how fire ratings for doors and partition walls are obtained.
18. Describe hardware requirements and the rules governing installations.
19. Describe the principles of fire retardant treatments and finishes of wood.
20. Describe the flame spread rating system as per CSA and NRC.
21. Identify and describe the importance of general equipment maintenance procedures relevant to:
   a) lubrication, belt tensions and power connections
   b) minimizing major repairs through regular checks and maintenance
   c) recognizing stress on equipment through unusual noises, vibrations, belt wear and loose belts

22. Describe the recommended procedures for reconditioning cutters and knives to ensure:
    a) balancing of cutter heads
    b) altering shape of cutters
23. Participate in a demonstration using CNC equipment.

D. Industry Practices ..... 6 Hours

Outcome: ***Upon completion of this section, the apprentice will be able to observe the use of CNC equipment, access and interpret regulations that pertain to codes, zoning and permits and the associate responsibilities of architects, contractors and subcontractors.***

1. Industry visitations where feasible, observations of procedures with special equipment normally associated with large production plants.
2. Participate in a demonstration using CNC equipment related to the Cabinetmaker industry.
3. Describe the role of federal, provincial and municipal authorities with regards to:
    a) research
    b) regulations and codes (NRC, CSA)
    c) zoning and permits
4. Describe the procedure for obtaining building permits.
5. Describe the basic zoning regulations.
6. Identify and describe the roles of architects, engineers and designers with regards to:
    a) design
    b) specification
    c) inspection of architectural woodwork
7. Describe the legal relationship that exists between the general and the sub-contractor.
8. Describe the responsibilities of the cabinetmaker in his relationship with the:
    a) client
    b) architect
    c) general contractor
    d) designer
9. Describe sequencing and scheduling of trades relevant to:
    a) bar-charts
    b) critical path methods
    c) scheduling (supply dates and starts)
    d) completion times
10. Describe the required procedures to follow for changing design and specifications of work in progress.
11. Identify and describe the importance of appropriate communications with fellow employees.
12. Describe proper customer relations.
13. Appreciate trades that follow-up on cabinetmaker's work.
14. List the Occupational Health and Safety Regulations that apply to cabinetmaking in general and to common cabinetmaking machinery specifically.
15. Describe emergency procedures and how to obtain assistance for injured workers.
16. Demonstrate an understanding of the purpose and structure of safety committees: when they are required, how members are appointed and whom they report to.

17. Identify the common toxins encountered in the cabinet-shop and the possible long and short-term effects of inhalation and skin contact.

18. Describe the preventive measures that can be taken to minimise or eliminate these health hazards.

19. Identify the regulations dealing with maximum allowable exposure to noise and define the word "decibels".

20. Identify and describe the types of hearing-protection devices and their effectiveness.

21. Identify the dangers associated with radiation from high frequency electronic gluing and drying equipment.

22. Describe the possible hazards from vibrating tools.

23. Describe the structure of companies with regards to:

    a) difference between proprietorship and Ltd. Co.
    b) payments, sales tax and G.S.T.
    c) contracts (general, construction)
    d) Alberta Bid Depository
    e) labour costs
    f) material costs
    g) overhead costs

24. Explain the basic requirements for valid legal contracts; circumstances that may result in voided contracts; what constitutes a breach of contract.

25. Demonstrate an understanding of where legal relationships exist in construction contracts and the legal precedence of construction documents regarding:

    a) owner
    b) architect
    c) designer
    d) general contractor
    e) sub-contractors
    f) suppliers-workers

26. Describe the Alberta Construction Tendering Systems (ACTS) in general and show an understanding of:

    a) functions and system
    b) common bonding requirements
    c) types of bonds

27. Describe how labour costs are calculated with regards to:

    a) direct wages
    b) indirect labour costs
    c) record keeping- (time sheets)
    d) piece-work

28. Explain how material costs are calculated from material-lists.

29. Demonstrate how unit-prices are applied and describe how sales tax is assessed.

30. List the most common overhead costs and identify the differences between:

    a) small shops
    b) large production shops

E. Installation Procedures ..... 2 Hours

Outcome: ***Upon completion of this section, the apprentice will be able to describe the proper methods for securing millwork.***

1. Identify the accepted heights and spacings of wall-mounted units.
2. Describe how studs or backings can be found in framed walls.
3. Describe the proper securing methods and materials:
   a) adhesives
   b) screws and bolts
   c) hollow and solid wall fasteners
4. Describe the problems associated with alignments and adjustments due to minor warpages and imperfect walls and floors.
5. Describe procedures for:
   a) levelling
   b) plumbing
   c) shimming
   d) scribing
6. Describe the checks for ease of operation following installation of doors, drawers, slides, etc.

F. Wood Finishing ..... 9 Hours

Outcome: ***Upon completion of this section, the apprentice will be able to Identify and describe advanced wood finishing treatments.***

1. Review second period materials relevant to wood surface preparation.
2. Identify products and describe procedures for typical wood finishing to commercial specifications for:
   a) bleaching, staining, filling, sealing
   b) top coats
   c) oil finishes
3. Describe special customized treatments and their applications related to:
   a) glazing
   b) shading (antique effects)
   c) distressing
4. Identify the different types of equipment and their applications.
5. Demonstrate an ability to maintain equipment in a safe manner.
6. Demonstrate an ability to use and handle products and equipment safely.

SECTION TWO: ..... SHOP ..... 120 HOURS

A. Machining and Assembling ..... 65 Hours

Outcome: ***Upon completion of this section, the apprentice will be able to complete in-class projects within required time; maintain tools and equipment.***

1. Demonstrate an ability to participate and complete projects assigned relative to fourth period theory:
   a) veneer work with various matchings
   b) veneer inlay work
   c) laminating and veneering curved components
   d) basic wood carving (e.g. cabriole legs)
2. Demonstrate an ability to maintain tools.
3. Perform basic maintenance on tools and equipment such as:
   a) reconditioning and changing knives in jointers and planers
   b) profile grinding and mounting of shaper knives
4. Use all standard tools and machines of the Cabinetmaker trade for a variety of standard operations safely and efficiently.

B. Wood Finishing ..... 10 Hours

Outcome: ***Upon completion of this section, the apprentice will be able to apply wood finishes to in-class projects.***

1. Demonstrate and participate in practical projects assigned.
2. Demonstrate an ability to complete projects within allotted times that reflect wood finishing procedures.
3. Demonstrate an ability to develop and complete projects requiring special customized treatments.

C. Practical Examination ..... 45 Hours

Outcome: ***Upon completion of this section, the apprentice will be able to complete in-class project ready for evaluation by industry.***

1. Each apprentice will be required to build to specifications an in-class project. Representatives from industry will assess the project and marks awarded will be a major consideration in awarding Completion of Apprenticeship and Journeyperson status.

SECTION THREE: ..... SHOP DRAWING ..... 40 HOURS

A. Comprehensive Review of Blueprints and Drawings Typically Encountered In The Cabinetmaker Trade ..... 5 Hours

Outcome: ***Upon completion of this section, the apprentice will be able to read and interpret advanced architectural drawings.***

1. Pass a comprehensive review test, incorporating first, second and third period subject matter.
2. Determine arbitrary and conflicting information within drawings and specifications.
3. Isolate the cabinetmaker's work by explaining the various details and specifications for walls, ceilings and columns in plan elevations, sectional and exploded views.
4. Correctly interpret reflected ceiling plans.

5. Discuss acceptable procedures of typical as well as unusual job problems arising from the study of plans and in-class assignments.

B. Shop Drawings.....25 Hours

Outcome: ***Upon completion of this section, the apprentice will be able to develop quick freehand sketches, layouts, templates, full scale patterns and shop drawings for all shop projects.***

1. Produce quick freehand sketches.
2. Develop layouts, templates and full-scale patterns.
3. Develop shop drawings for all shop projects.
4. Develop appropriate cutting lists.
5. Produce shop drawing for the FINAL SHOP PROJECT according to detailed specifications and instructions.

C. Computer Drawing Applications.....10 Hours

Outcome: ***Upon completion of this section, the apprentice will be able to demonstrate the ability to develop detail drawings using the computer.***

1. Demonstrate an ability to develop detail drawings for the final in-class project to include:
   a) orthographic views
   b) sectional views
   c) simple isometric
   d) materials list
   e) construction procedures

SECTION FOUR: ..... TRADE MATHEMATICS..... 24 HOURS

A. Assignments Will Relate to Course Content Outlined in Theory, Shop and Shop Drawing Sections

Outcome: ***Upon completion of this section, the apprentice will be able to demonstrate knowledge in all areas related to trade math and problem solving, take offs, workflow and timetables.***

1. Display competency in solving problems typical of third period math.
2. Demonstrate an ability to calculate, do material take-off and layout procedures using blueprints.
3. Take-off of interior components from commercial drawings and specifications.
4. Select materials to minimise waste.
5. Calculate the mechanical advantage of levers, gears and pulleys.
6. Calculate material requirements and relative costs involving different waste-factors due to various lumber grades.
7. Calculate the cost of labour, relative to the number of operations and set-ups.
8. Interpret as well as develop graphic representations of workflow and timetables.

Excellence through training and experience

3604.2

LRC # 536948