VOCATIONAL TRAINING PROGRAM

CABINETMAKING (DVS 5852)

WOODWORKING AND FURNITURE MAKING SECTOR

ENSEMBLE on fait avancer le Québec

Québec

VOCATIONAL TRAINING PROGRAM

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Introduction to the Program

In vocational training, a program of study presents the competencies required to practise a given trade or occupation at entry level on the job market. The training provided allows students to acquire a degree of versatility that will be useful in their career and personal development.

A program is a coherent set of competencies to be developed. It outlines the knowledge and broad orientations to be favoured during training. The competencies correspond to the tasks of the trade or occupation or to activities related to work, vocational or personal life, depending on the case. Learning is acquired in a specific achievement context and targets the ability to act, succeed and evolve.

According to the *Education Act*,[1] "every program shall include compulsory objectives and contents and may include optional objectives and contents that shall be enriched or adapted according to the needs of students who receive the services." For behavioural competencies, the compulsory components include the statement of the competency, the elements of the competency, the achievement context and the performance criteria; for situational competencies, they include the corresponding components.

For information purposes, programs also provide a grid of competencies, educational aims, a summary of competency-related knowledge and know-how, and guidelines. They also specify the suggested duration of each competency. All optional components of a program may be enriched or adapted according to the needs of the students, the environment and the workplace.

Program Components

Program Goals

Program goals consist of the expected outcome at the end of training as well as a general description of a given trade or occupation. They also include the four general goals of vocational training.

Educational Aims

Educational aims are broad orientations to be favoured during training in order to help students acquire intellectual or motor skills, work habits or attitudes. Educational aims usually address important aspects of career and personal development that have not been explicitly included in the program goals or competencies. They serve to orient appropriate teaching strategies to contextualize students' learning, in keeping with the dimensions underlying the practice of a trade or occupation. They help guide educational institutions in implementing the program.

Competency

A competency is the ability to act, succeed and evolve in order to adequately perform tasks or activities related to one's working or personal life, based on an organized body of knowledge and skills from a variety of fields, perceptions, attitudes, etc.

A competency in vocational training can be defined in terms of a behaviour or a situation, and includes specific practical guidelines and requirements for learning.

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1 *Education Act,* CQLR, chapter I-13.3, section 461.

1. Behavioural Competency

A behavioural competency describes the actions and the results expected of the student. It consists of the following features:

- The *statement of the competency* is the result of the job analysis, the orientations and general goals of vocational training and other determinants.
- The *elements of the competency* correspond to essential details that are necessary in order to understand the competency and are expressed in terms of specific behaviours. They refer to the major steps involved in performing a task or to the main components of the competency.
- The *achievement context* corresponds to the situation in which the competency is exercised at entry--level on the job market. The achievement context attempts to recreate an actual work situation but does not describe a learning or evaluation situation.
- The *performance criteria* define the requirements to be respected. They may refer to elements of the competency or to the competency as a whole. When associated with a specific element, performance criteria are used to judge whether a competency has been acquired. When associated with the competency as a whole, the criteria describe the requirements for performing a task or activity and provide information on the expected level of performance or the overall quality of a product or service.

2. Situational Competency

A situational competency describes the situation in which students are placed to acquire learning, and allows for actions and results to vary from one student to another. It consists of the following features:

- The *statement of the competency* is the result of the job analysis, the orientations and general goals of vocational training and other determinants.
- The *elements of the competency* outline the essential aspects of the competency and ensure a better understanding of the competency with respect to the expected outcome. The elements of the competency are fundamental to the implementation of the learning situation.
- The *learning context* provides a broad outline of the learning situation designed to help the students develop the required competency. It is normally divided into three key phases of learning: information, participation and synthesis.
- The *instructional guidelines* provide reference points and means for teachers to ensure that learning takes place and that the context in which it occurs is always the same. These guidelines may include general principles or specific procedures.
- The *participation criteria* describe requirements that the students must meet when participating in learning activities. They focus on how the students take part in the activities rather than on the results obtained. Participation criteria are normally provided for each phase of the learning situation.

Competency-Related Knowledge and Know-How

Competency-related knowledge and know-how together with related guidelines are provided for information purposes. Competency-related knowledge and know-how define the essential and meaningful learning that students must acquire in order to apply and continue to develop the competency. They are in keeping with the job market and are accompanied by guidelines that provide information about the field of application, level of complexity and learning content. They generally encompass learning associated with knowledge, skills, strategies, attitudes, perceptions, etc.

Duration

The total duration of the program is compulsory and must be observed. It consists of teaching time, which includes time for the evaluation of learning and for enrichment or remedial activities, depending on the students' needs. The duration indicated for a given competency refers to the amount of time needed to develop the competency.

The amount of teaching time corresponds to the amount of time allotted to training, which is established during program development as the average amount of time needed to acquire a competency and evaluate learning. This duration is helpful in organizing training.

Credit

A credit is a unit used for expressing the quantitative value of each competency. One credit corresponds to 15 hours of training.

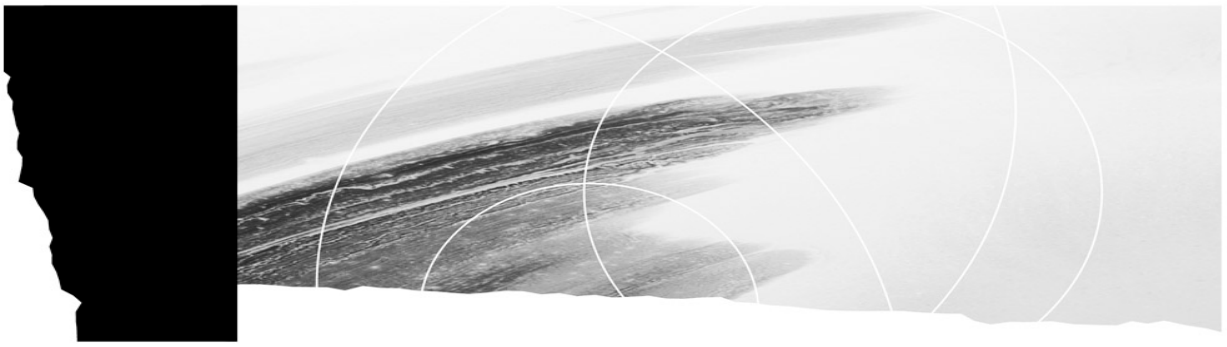
Aspects of Program Implementation

Program-Based Approach

The program-based approach is founded on a comprehensive view of a program of study and its components (e.g. goals, educational aims, competencies). It requires concerted action among all players involved, from the initial stages of program design and development, to program implementation and evaluation. It consists in ensuring that all of the actions and activities proposed are based on the same aims and take into account the same orientations. For students, the program-based approach makes training more meaningful as it presents learning as a coherent whole.

Competency-Based Approach

In vocational training, the competency-based approach is based on a teaching philosophy that is designed to help students mobilize their own individual sets of resources in order to act, succeed and evolve in different contexts, according to established performance levels with all the required knowledge and know-how (e.g. skills, strategies, attitudes, perceptions).



5852	**Cabinetmaking**

Year of approval: 2016

Certification:	Diploma of Vocational Studies
Number of credits:	110
Number of competencies:	21
Total duration:	1 650 hours

To be eligible for admission to the *Cabinetmaking* program, candidates must meet one of the following requirements:

- Persons holding a Secondary School Diploma or its recognized equivalent.

OR

- Persons who are at least 16 years of age on September 30 of the school year in which they begin their training must meet the following condition: they must have earned Secondary IV credits in language of instruction, second language and mathematics in programs established by the Minister, or have been granted recognition of equivalent learning.

OR

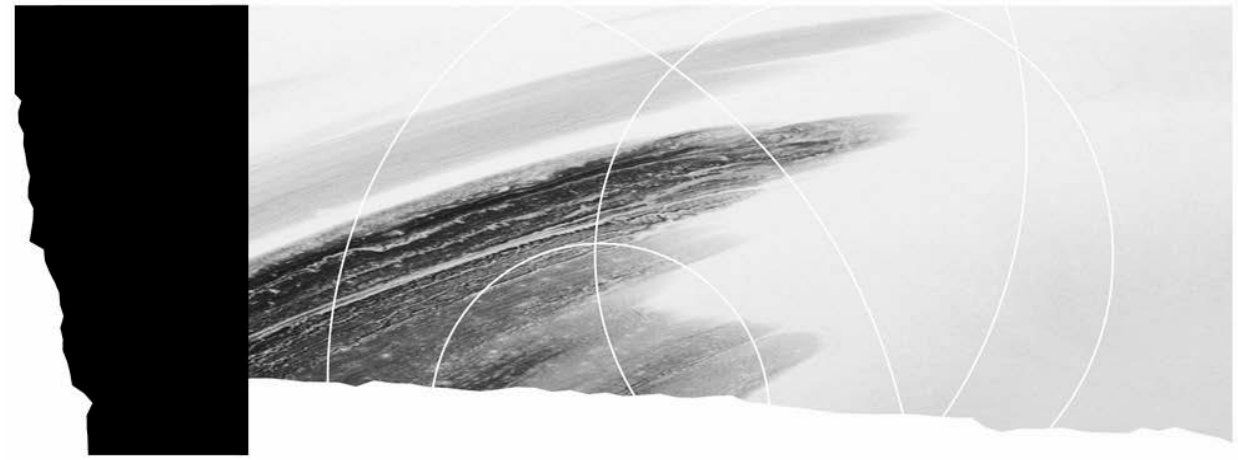
- Persons who are at least 18 years of age upon entry into the program must have the following functional prerequisites: the successful completion of the general development test and ENG 3070-3, or recognition of equivalent learning.

OR

- Persons who have obtained Secondary III credits in language of instruction, second language and mathematics in programs established by the Minister are required to pursue general education courses, concurrently with their vocational training, in order to obtain the Secondary IV credits they lack in language of instruction, second language and mathematics in programs established by the Minister.

The duration of the program is 1 650 hours, which includes 930 hours spent on the specific competencies required to practise the trade and 720 hours on general, work-related competencies. The program of study is divided into 21 competencies, which vary in length from 30 to 120 hours. The total hours allocated to the program include time devoted to teaching, evaluation of learning and enrichment or remedial activities.

Competency	Code	Number	Hours	Credit
The Trade and the Training Process	773312	1	30	2
Interpreting Drawings	773325	2	75	5
Taking Measurements and Doing Calculations	773332	3	30	2
Using Hand Tools	773345	4	75	5
Preparing Furniture Parts	773358	5	120	8
Assembling Furniture	773368	6	120	8
Patterns, Templates, Jigs and Fixtures	773372	7	30	2
Impact of Finishing Processes on Manufacturing	773384	8	60	4
Making Drawings	773395	9	75	5
Making Straight Furniture Out of Solid Wood	773406	10	90	6
Veneering and Laminating Materials	773412	11	30	2
Making Panel Furniture	773426	12	90	6
Planning the Manufacturing of a Product	773432	13	30	2
Manufacturing Commercial, Industrial or Institutional Furniture	773448	14	120	8
Manufacturing and Installing Kitchens	773457	15	105	7
Exploring Traditional and Innovative Techniques	773468	16	120	8
Making Curved Furniture	773478	17	120	8
Manufacturing and Installing Architectural Products	773488	18	120	8
Developing Products	773494	19	60	4
Technical Support and Prototyping	773504	20	60	4
Entering the Workforce	773516	21	90	6



PART I

Program Goals

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Program Goals

The *Cabinetmaking* program prepares students to practise the trade of cabinetmaker.

Cabinetmakers make products out of wood and wood-based and related materials. These products include furniture; built-in residential kitchen, bathroom, living room and entertainment room furnishings; and built-in commercial, industrial and institutional furnishings for stores, offices, hotels, public buildings and other facilities. Cabinetmakers also make architectural products, such as wood panelling, mouldings, doors and windows, staircase components and balconies. They can also make furniture and decorative items for boats and airplanes, as well as a wide range of other wooden objects. Generally speaking, cabinetmakers plan their work using drawings, shape parts, assemble components, sand and prepare surfaces for finishing, install the products where permitted by law, and provide technical support for production. In microbusinesses, cabinetmakers can also work on the technical development of certain products. In all cases, they are responsible for keeping a clean and tidy work area and for performing preventive maintenance on the equipment they use.

For the most part, cabinetmakers work in companies that produce custom furnishings and whose projects include a relatively large number of different products that are custom designed and made based on instructions, drawings and specifications provided by the client. In this case, they use automated equipment for similar components and products. They also use more conventional techniques and tools for making unique components. Some cabinetmakers work in large-scale production companies or in microbusinesses that make unique products designed and made at the client's request.

The program goals of the *Cabinetmaking* program are based on the general goals of vocational training. These goals are as follows:

- *To help students develop effectiveness in the practice of a trade or occupation, that is:*
  - to teach students to perform roles, functions, tasks and activities associated with the trade or occupation upon entry into the job market
  - to prepare students to progress satisfactorily on the job (which implies having the technical and technological knowledge and skills in such areas as communication, problem solving, decision making, ethics, health and safety)
- *To help students integrate into the work force, that is:*
  - to familiarize students with the job market in general, and with the specific context of their chosen trade or occupation
  - to familiarize students with their rights and responsibilities as workers
- *To foster students' personal development and acquisition of occupational knowledge, skills, perceptions and attitudes, that is:*
  - to help students develop their autonomy and ability to learn, and acquire effective work methods
  - to help students understand the principles underlying the techniques and the technology used in the trade or occupation
  - to help students develop self-expression, creativity, initiative and entrepreneurial spirit
  - to help students adopt the attitudes required to successfully practise the trade or occupation, and instill in them a sense of responsibility and a concern for excellence

- *To promote job mobility, that is:*
  - to help students develop positive attitudes toward change
  - to help students develop the means to manage their careers by familiarizing them with entrepreneurship

Educational Aims

The aim of the *Cabinetmaking* program is to help students develop attitudes and behaviours that representatives from education and the field deem essential to the practice of the trade:

- *Manual dexterity combining precision and meticulousness*
- *Sense of observation and spatial perception*
- *Autonomy and resourcefulness in executing tasks and solving problems related to cabinetmaking*
- *Sense of responsibility that includes:*
  - the ability to make decisions within the scope of their responsibilities
  - diligence and perseverance
  - concern for the economical use of materials
  - careful use of equipment, materials and products
  - punctuality

Statements of the Competencies

List of Competencies

- Determine their suitability for the trade and the training process.
- Interpret drawings.
- Take measurements and do calculations required for manufacturing.
- Make an object using hand tools.
- Prepare the parts for a piece of furniture to be manufactured.
- Assemble furniture.
- Make patterns, templates, jigs and fixtures.
- Analyze of the impact of finishing processes on manufacturing.
- Make technical drawings.
- Make a straight piece of furniture out of solid wood.
- Veneer and laminate materials.
- Make panel furniture.
- Plan the manufacturing of a product.
- Manufacture commercial, industrial or institutional furniture.
- Manufacture and install modular kitchen components.
- Explore traditional and innovative techniques.
- Make curved furniture.
- Manufacture and install architectural products.
- Help develop a product.
- Provide technical support for a manufacturing project.
- Enter the workforce.

Grid of Competencies

The grid of competencies shows the relationship between general competencies, which correspond to work-related activities, and specific competencies, which are required to practise the particular trade or occupation, as well as the major steps in the work process.

The general competencies appear on the horizontal axis and the specific competencies, on the vertical axis. The symbol (○) indicates a correlation between a general and a specific competency. The symbol (∆) indicates a correlation between a specific competency and a step in the work process. Shaded symbols indicate that these relationships have been taken into account in the acquisition of specific competencies. The logic used in constructing the grid influences the course sequence. Generally speaking, this sequence follows a logical progression in terms of the complexity of the learning involved and the development of the students' autonomy. The vertical axis presents the specific competencies in the order in which they should be acquired and serves as a point of departure for determining how all of the competencies will be taught.

GRID OF COMPETENCIES

CABINETMAKING *SPECIFIC COMPETENCIES*	Competency number	Type of competency	Duration (in hours)	GENERAL COMPETENCIES											WORK PROCESSES							TOTAL
				Determine their suitability for the trade and the training process	Interpret drawings	Take measurements and do calculations required for manufacturing	Prepare the parts for a piece of furniture to be manufactured	Assemble furniture	Make patterns, templates, jigs and fixtures	Analyze the impact of finishing processes on manufacturing	Make technical drawings	Veneer and laminate materials	Plan the manufacturing of a product	Explore traditional and innovative techniques	Prepare the work	Take safety measures	Make the product	Check the quality of the work	Protect or pack the product	Install the product	Clean and tidy up the work area	
Competency number				1	2		5	6	7	8	9	11	13	16								
Type of competency				S	B	B	B	B	B	B	B	B	B	B								
Duration (in hours)				30	75	30	120	120	30	60	75	30	30	120								720
Make an object using hand tools	4	B	75	O	●	●	O	O	O	O	O		O	O	▲	▲	▲	▲	△		▲	
Make a straight piece of furniture out of solid wood	10	B	90	O	●	●	●	●	●	●	O		O	O	▲	▲	▲	▲	△	△	▲	
Make panel furniture	12	B	90	O	●	●	●	●	●	●	O	●	O	O	▲	▲	▲	▲	△	△	▲	
Manufacture commercial, industrial or institutional furniture	14	B	120	O	●	●	●	●	●	●	●	●	●	O	▲	▲	▲	▲	▲		▲	
Manufacture and install modular kitchen components	15	B	105	O	●	●	●	●	●	●	●	●	●	O	▲	▲	▲	▲	△	▲	▲	
Make curved furniture	17	B	120	O	●	●	●	●	●	●	●	●	●	●	▲	▲	▲	▲	△	△	▲	
Manufacture and install architectural products	18	B	120	O	●	●	●	●	●	●	●	●	●	O	▲	▲	▲	▲	▲	▲	▲	
Help develop a product	19	B	60	O	●	●	●	●	●	●	●	●	●	●	▲	▲	▲	▲				
Provide technical support for a manufacturing project	20	B	60	O	●	●	●	●	●	●	O	●	●	●	▲	▲	▲	▲			▲	
Enter the workforce	21	S	90	O	O	O	O	O	O	O	O	O	O	O	△	△	△	△	△	△	△	
Total duration			930																			1 650

Harmonization

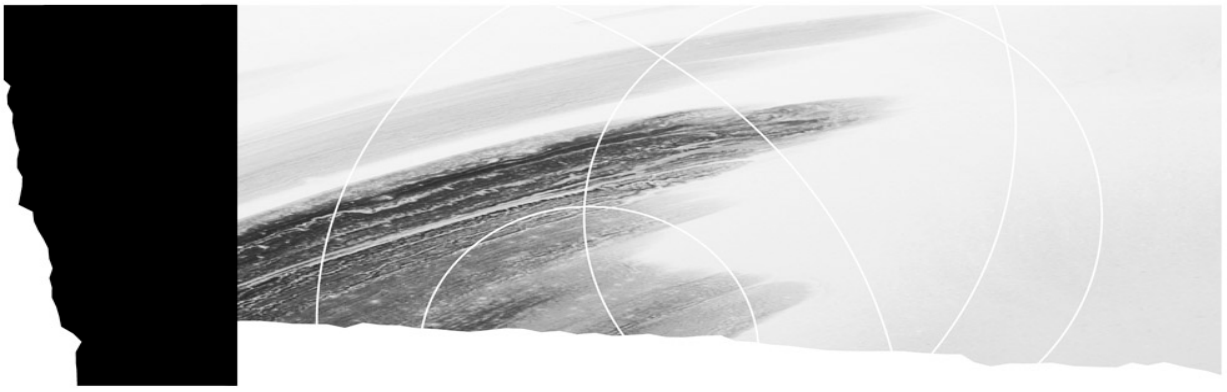
The Ministère de l'Éducation et de l'Enseignement supérieur harmonizes its vocational and technical programs by establishing similarities and continuity between secondary- and college-level programs within a particular sector or between sectors in order to avoid overlap in program offerings, to recognize prior learning and to optimize the students' progress.

Harmonization establishes consistency between training programs and is especially important in ensuring that the tasks of a trade or occupation are clearly identified and described. Harmonization makes it possible to identify tasks requiring competencies that are common to more than one program. Even if there are no common competencies, training programs are still harmonized.

Harmonization is said to be "inter-level" when it focuses on training programs at different levels, "intra-level" when it focuses on programs within the same educational level, and "inter-sector" when carried out between programs in various sectors.

An important aspect of harmonization is that it allows the common features of competencies to be identified and updated as needed. Common competencies are those that are shared by more than one program; once acquired in one program, they can be recognized as having been acquired in another. Competencies with exactly the same statement and elements are said to be identical. Common competencies that are not identical but have enough similarities to be of equal value are said to be equivalent.

Harmonization of the *Cabinetmaking* program has resulted in identifying competencies that are shared with other programs. Detailed information on the harmonization of this program and its results is presented in the document entitled *Tableaux d'harmonisation Ébénisterie*.



PART II

Program Competencies

The Trade and the Training Process	Code: 773312

Competency 1 Duration 30 hours Credits 2

Situational Competency

Statement of the Competency

Determine their suitability for the trade and the training process.

Elements of the Competency

- Be familiar with the nature of the trade.
- Understand the training process.
- Confirm their career choice.

Learning Context

Information Phase

- Learning about the job market in cabinetmaking.
- Learning about the nature and requirements of the trade.
- Learning about the training process.
- Sharing their initial reactions to the trade and the training process.

Participation Phase

- Presenting the information gathered from meetings with trade specialists and discussing their perception of the trade: advantages, disadvantages, requirements.
- Discussing the skills, aptitudes and knowledge needed to practise the trade.
- Identifying health and safety risks.
- Discussing the program of study as it relates to the trade.

Synthesis Phase

- Producing a report in which they:
  - sum up their aptitudes and interests with regard to the trade
  - assess their career choice by comparing different aspects and requirements of the trade with their preferences, aptitudes and interests

Instructional Guidelines

- Create a climate in which students can express themselves freely.
- Make the appropriate documentation available.
- Organize a meeting with trade specialists.
- Motivate students to participate in the proposed activities.
- Provide students with the means to assess their career choice objectively.

Participation Criteria

Information Phase

- Gather information on most of the topics to be covered.
- Present their views on the trade, making connections with the information gathered.

Participation Phase

- Participate actively in the activities organized.
- Adequately express their views on the program of study.
- Give their opinions on some requirements for practising the trade.
- Recognize the importance of occupational health and safety.

Synthesis Phase

- Produce a report in which they:
  - sum up their preferences and interests
  - explain their career choice, clearly making the required connections

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each phase of the learning context, along with their attendant guidelines.

Information Phase

- Characteristics of the job market: job prospects, working conditions, hiring criteria and remuneration, opportunities for promotion and transfer, etc.
- Occupational health and safety (see appendix)
- Nature and requirements of the trade: types of tasks, responsibilities, professional ethics, companies' quality standards, etc.

Participation Phase

- Characteristics and requirements of the training process: program of study, evaluation, certification of studies, volume of work required, rules, student services, schedule, etc.
- Connection between program competencies and tasks, operations, knowledge and skills

Synthesis Phase

- Presentation methods: notes, summaries and presentations
- Report on their strengths and weaknesses as they relate to the trade

Interpreting Drawings	Code: 773325

Competency 2 Duration 75 hours Credits 5

Behavioural Competency

Statement of the Competency	**Achievement Context**
Interpret drawings.	• Given furniture drawings • Using a computer • Using drawing materials for making sketches
Elements of the Competency	**Performance Criteria**
1. Find information in a drawing.	• Accurate distinction between the different parts of a drawing • Relevant use of information in the title block • Confirmation that the correct version of the drawing is being used • Appropriate use of measurement scale
2. Visualize a piece of furniture and its components.	• Appropriate distinction between the different views • Accurate identification of the parts of each component of the furniture • Accurate interpretation of lines, dashes and hatching • Identification of moving parts and how they move
3. Verify the accuracy of the dimensions.	• Accurate interpretation of the value of the dimensions • Relevant connections between the dimensions and the surfaces of the different views
4. Find complementary information.	• Accurate interpretation of symbols and abbreviations • Appropriate use of references
5. Communicate their understanding of the product using a sketch.	• Appropriate arrangement of views • Faithful and proportional representation of the product • Accurate indication of dimensions and relevant information • Productive discussions with colleagues
	For the competency as a whole: • Accurate use of technical terms • Demonstration of a sense of responsibility

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each element of the competency, along with their attendant guidelines.

For the competency as a whole:

- Distinction between specifications, assembly drawings, detail drawings, shop drawings, sketches and blueprints
- Terminology specific to technical drawing
- Concern for detail
- Risks present in the workplace: workstation ergonomics and the pressure of deadlines (see appendix)
- Specific attitude required for this competency: sense of responsibility, since the use of drawings has a major impact on manufacturing

1. Find information in a drawing.
    - Parts of a set of drawings: types of drawings, complementary information
    - Title block: name of the part, measurement scale, type of projection, name of draftsperson, version, other notes
    - Metric and imperial systems of measurement

2. Visualize a piece of furniture and its components.
    - Reading of American and European drawings
    - Views: front, top, side, cross-section, detail
    - Drawing conventions: types of lines, dashes and hatching
    - Indication of parts of a component, e.g. those of a door
    - Spatial perception of the product and movement of parts

3. Verify the accuracy of the dimensions.
    - Conventions used for dimensioning
    - Reading of dimensions
    - Identification of errors

4. Find complementary information.
    - Drawing conventions: symbols, abbreviations, references, bubbles, etc.
    - Specific features of furniture drawings as they apply to the aerospace industry

5. Communicate their understanding of the product using a sketch.
    - Circumstances justifying the use of sketches
    - Importance of feedback in order to clarify perceptions
    - Techniques: perspective, rendering, squaring off, etc.
    - Dimension placement conventions

Taking Measurements and Doing Calculations	Code: 773332

Competency 3 Duration 30 hours Credits 2

Behavioural Competency

Statement of the Competency

Take measurements and do calculations required for manufacturing.

Achievement Context

- Using the metric and imperial systems of measurement
- Given drawings
- Using measuring instruments
- Using a calculator or electronic spreadsheet
- Using forms for cutting lists and orders

Elements of the Competency	Performance Criteria
1. Measure objects and installation areas.	• Correct determination of measurements to be taken • Appropriate choice of measuring instruments • Proper use of measuring instruments • Precise measurements
2. Calculate the dimensions of linear and geometric shapes.	• Appropriate choice of calculation method • Accurate results
3. Calculate the quantities of raw materials needed.	• Accurate interpretation of information in the drawing • Sound reasoning • Accurate number of board feet needed
4. Quantify the materials needed for manufacturing.	• Appropriate calculation of percentage loss • Accurate determination of quantities needed based on the number of objects to be manufactured • Cross-checking of calculations
	For the competency as a whole: • Use of the appropriate measurement system • Relevant conversion of units of measurement • Careful work

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each element of the competency, along with their attendant guidelines.

For the competency as a whole:

- Choice of metric or imperial system of measurement, as needed
- Conversion of measurements and use of charts
- Risks present in the workplace: workstation ergonomics, the pressure of deadlines and risks associated with taking measurements on a construction site (see appendix)
- Specific attitude for this competency: meticulousness, given the extreme precision of the measurements

1. Measure objects and installation areas.
    - Measurement of raw materials for products, the areas in which they are to be installed, etc.
    - Measuring instruments: vernier callipers, tape measure, laser, square, protractor, ruler, etc.
    - Use of instruments: when, why and how
    - Dimensions to be measured: length, width, depth, thickness, height
    - Measurement techniques depending on the instrument
    - Level of precision required in cabinetmaking

2. Calculate the dimensions of linear and geometric shapes.
    - Difference between lines, surfaces and volumes
    - Calculation of diagonals, angles, perimeters, surface areas, radii, diameters, volumes
    - Basic operations using whole numbers, decimals and fractions

3. Calculate the quantities of raw materials needed.
    - Interpretation of the information in the drawing in order to prepare a cutting list
    - Contents of a cutting list
    - Calculation of gross dimensions based on finished dimensions
    - Calculation of linear or surface area measurements
    - Calculation of board feet

4. Quantify the materials needed for manufacturing.
    - Identification and grouping of materials and measurements
    - Application of the rule of three
    - Percentage loss and optimization of cuts
    - Verification of results: accurate, significant, logical, useful for determining the quantity of materials needed for the project

Using Hand Tools	Code: 773345

Competency 4 Duration 75 hours Credits 5

Behavioural Competency

Statement of the Competency

Make an object using hand tools.

Achievement Context

- In a workshop
- Working on a basic project using solid wood, e.g. a chest
- Given a drawing, a cutting list and a procedure specification
- Using the necessary tools and materials

Elements of the Competency	Performance Criteria
1. Become familiar with the work to be done.	• Accurate interpretation of drawing • Appropriate interpretation of cutting list
2. Implement the required safety measures.	• Appropriate identification of potential risks and their impact on health and safety • Determination of relevant safety measures
3. Choose the raw materials.	• Accurate calculation of the quantities of materials needed • Appropriate selection of raw materials • Careful examination of the condition, quality and quantity of raw materials
4. Prepare the hand tools.	• Appropriate selection of tools • Appropriate sharpening of tools • Precise adjustment of guides and safety accessories
5. Prepare the parts for assembly.	• Methodical work • Accurate part dimensions based on the drawing
6. Assemble the parts.	• Methodical assembly procedure • Use of appropriate assembly techniques • Careful sanding and cleaning
7. Check the quality of the object.	• Compliance with drawing • Appropriate final cleaning
8. Maintain the work area and equipment.	• Clean and tidy work area • Appropriate maintenance of tools • Disposal or recovery of waste in accordance with instructions

For the competency as a whole:

- Consistent application of health and safety rules
- Ergonomic work posture
- Concern for the economical use of materials
- Systematic application of procedure
- Focus and patience

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each element of the competency, along with their attendant guidelines.

For the competency as a whole:

- Basic technical terminology
- Basic hand tools used in this competency: planes, saws, mallets, hammers, wood chisels, squares, files, rasps, pliers, screwdrivers, measuring instruments, etc.
- Occupational health and safety: individual protective equipment, equipment safety, ergonomic work posture, etc.
- Method for using materials economically
- Importance of following the manufacturing process for the object
- Specific attitude required for this competency: patience, in order to persevere in spite of difficulties encountered

1. Become familiar with the work to be done.
   - Application of knowledge covered in *Interpreting Drawings*

2. Implement the required safety measures.

   See appendix for the occupational health and safety risks listed in the job analysis report.
   - Risk sources
   - Effects on health and safety
   - Preventive measures

3. Choose the raw materials.
   - Calculation of the quantity of materials needed based on the cutting list
   - Distinction between solid wood, wood-based products and related products (composites, metals, marble, etc.)
   - Different types of wood:
     - indigenous and exotic
     - deciduous and coniferous
   - Criteria for choosing a type of wood: mechanical properties, availability, etc.
   - Qualities and defects to check when selecting wood
   - Safe methods for handling and transporting materials

4. Prepare the hand tools.
    - Connection between the tools and the work to be done
    - Checkpoints for determining the condition of the tools
    - Methods for adjusting and sharpening tools
    - Health and safety measures to be taken

5. Prepare the parts for assembly.
    - Application of measuring techniques
    - Marking out of parts and indications (symbols generally used to define the position of each part of a project)
    - Breakdown using hand tools: cross-cutting, planing, thicknessing
    - Other operations using hand tools: drilling, gluing, pressing, cutting, fretwork
    - Sanding: tools, materials and techniques
    - Dimensions to be checked: squareness, thickness, width, length, etc.

6. Assemble the parts.
    - Appropriate assembly procedure for the object to be manufactured
    - Verification of levelness, squaring, straightness and adjustment of parts
    - Assembly techniques: gluing, nailing, drilling, screwing, clamping, etc.
    - Correction and adjustment of parts
    - Assessment of successful assembly at the end of the process

7. Check the quality of the object.
    - Quality standards in companies
    - Quality control procedure
    - Final cleaning requirements

8. Maintain the work area and equipment.
    - Maintenance of accessories and tools used for this competency: dust removal, lubrication, parts replacement, etc.
    - Cleaning of benches and work area
    - Storage of tools and materials
    - Environmental protection

Preparing Furniture Parts	Code: 773358

Competency 5 Duration 120 hours Credits 8

Behavioural Competency

Statement of the Competency	**Achievement Context**
Prepare the parts for a piece of furniture to be manufactured.	• In a workshop • Working as part of a team • Working on a basic piece of furniture • Given a drawing, a cutting list, instructions and procedures • Using the necessary equipment and materials • Using pre-made patterns, templates, jigs or fixtures

Elements of the Competency	**Performance Criteria**
1. Prepare the work.	• Identification of relevant data in the drawing and cutting list • Accurate determination of the quantities of materials needed • Accurate selection of materials • Determination of the appropriate equipment
2. Implement the required safety measures.	• Appropriate identification of potential risks and their impact on health and safety • Establishment of safety measures • Conscientious verification and installation of safety accessories on the machines
3. Cut the raw materials.	• Appropriate adjustment of equipment • Appropriate installation and adjustment of cutting tool • Proper installation of safety devices • Methodical work • Precise measurements
4. Prepare bonded panels made of solid wood.	• Appropriate preparation of surfaces to be glued • Appropriate choice of glue and clamps • Methodical work • Observance of drying time • Compliance with requirements
5. Shape parts.	• Appropriate preparation of machines • Observance of cutting and speed feeds • Correct performance of a pre-test with the pattern, template, jig or fixture • Appropriate adjustments • Compliance with drawing

6. Check the quality of the parts produced.	• Meticulous monitoring of the quality and compliance of parts • Appropriate final cleaning
7. Maintain the work area and equipment.	• Clean and tidy work area • Appropriate maintenance of equipment • Disposal or recovery of waste in accordance with instructions
	For the competency as a whole:
	• Consistent application of occupational health and safety rules • Concern for the economical use of materials • Methodical application of work steps and procedures

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each element of the competency, along with their attendant guidelines.

For the competency as a whole:

- Terminology related to shaping
- Basic stationary machine tools used for this competency: saws, jointers, planers, mortisers, tenoners, routers, drills, etc.
- Shaping procedure
- Compliance with rules regarding the economical use of materials and quality control at every step
- Specific attitude and skills required for this competency: effective communication with team members, in order to ensure methodical work and a pleasant atmosphere

1. Prepare the work.
   - Application of knowledge covered in *Interpreting Drawings* and *Taking Measurements and Doing Calculations*
   - Classification of wood based on quality criteria
   - Specific details concerning the preparation of parts made of solid wood and wood-based products
   - Distinction between the different stationary machine tools in a shop
   - Use of stationary machine tools for shaping
   - Selection criteria for tool holders based on the materials and operations required

2. Implement the required safety measures.

   See appendix for the occupational health and safety risks listed in the job analysis report.
   - Risk sources
   - Effects on health and safety
   - Preventive measures

3. Cut the raw materials.
    - Work process: measuring, marking out, cross-cutting, sawing with the grain, planing, thicknessing, etc.
    - Methods for adjusting machine tools
    - Type, use and installation of cutting tools, accessories and safety devices
    - Importance of precise measurements

4. Prepare bonded panels made of solid wood.
    - Evolution of glues with the arrival of paneling on the market
    - Types of clamps and their uses
    - Gluing and clamping techniques: why, how, how long, how much pressure, etc.
    - Importance of the systematic preparation of panels: thickness of parts, alternating grains, final flatness, dimensions, etc.

5. Shape parts.
    - Methods for adjusting machine tools
    - Methods for selecting, installing and adjusting cutting tools, accessories and safety devices
    - Machine tool jigs and fixtures and how to use them
    - Machine tool techniques: drilling, pressing, coping, fretwork, etc.

6. Check the quality of the parts produced.
    - Meticulous adjustment of parts
    - Quality control procedure and criteria

7. Maintain the work area and equipment.
    - Specific maintenance for stationary machine tools
    - Maintenance of accessories and tools used for this competency: dust removal, lubrication, parts replacement, etc.
    - Cleaning of benches and work area
    - Storage of tools and materials
    - Disposal and recovery of materials to ensure environmental protection

Assembling Furniture	Code: 773368

Competency 6 Duration 120 hours Credits 8

Behavioural Competency

Statement of the Competency	**Achievement Context**
Assemble furniture.	• In a workshop • Working as part of a team • Working on basic furniture made of wood or wood-based products • Given the necessary parts • Given a drawing, a cutting list, instructions and procedures • Using the necessary equipment and materials, including a pre-programmed numerical control machine tool • Given hardware data sheets • Using pre-made patterns, templates, jigs and fixtures

Elements of the Competency	**Performance Criteria**
1. Prepare the work.	• Appropriate choice of materials based on the instructions • Determination of the appropriate equipment • Appropriate identification of the technical characteristics of the hardware • Correct interpretation of procedures • Verification of measurements
2. Implement the required safety measures.	• Appropriate identification of potential risks and their impact on health and safety • Determination of safety measures • Conscientious verification and installation of safety accessories on the machines
3. Prepare the furniture to receive the hardware.	• Appropriate use of numerical-control machine tool and other tools • Compliance with data sheets
4. Install the hardware.	• Use of appropriate techniques • Compliance with data sheets • Precise adjustment of hardware according to data sheets
5. Assemble the components.	• All parts on hand before assembly • Methodical assembly of each component, then of the piece of furniture • Use of appropriate assembly techniques

6. Prepare the furniture for staining, if applicable.	• Thorough cleaning of furniture • Use of appropriate sanding techniques • Careful removal of dust
7. Ensure the quality of the assembly.	• Appropriate adjustment of components to ensure the mobility of the parts • Compliance with drawing and quality requirements • Meticulous final cleaning
8. Maintain the work area and equipment.	• Clean and tidy work area • Appropriate maintenance of equipment • Disposal or recovery of waste in accordance with instructions
	For the competency as a whole: • Consistent application of occupational health and safety rules • Ergonomic work posture • Concern for the economical use of materials • Methodical application of work steps • Respect for teammates

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each element of the competency, along with their attendant guidelines.

For the competency as a whole:

- Terminology related to assembly
- Basic portable tools used for this competency: routers, drills, screwdrivers, nail guns, etc.
- Use of tools and machine tools covered in previous competencies
- Assembly procedure
- Compliance with rules regarding the economical use of materials and quality control at every step
- Specific attitudes required for this competency: observance of their capabilities and limitations and those of teammates, and respect for the environment

1. Prepare the work.

    - Application of knowledge covered in *Interpreting Drawings* and *Taking Measurements and Doing Calculations*
    - Traditional and modern assembly methods: mortise and tenon, dovetail, biscuit joints, etc.
    - Glues: characteristics, types, etc.
    - Hardware (fasteners): connectors, rotating connectors, closures, slides and retainers, eccentric connectors (Rastex), utilitarian elements, decorative elements, etc.
    - Choice of assembly methods based on the type of material, the required strength and production constraints
    - Technical information needed to install the hardware

2. Implement the required safety measures.

   See appendix for the occupational health and safety risks listed in the job analysis report.
   - Risk sources
   - Effects on health and safety
   - Preventive measures

3. Prepare the furniture to receive the hardware.

   - Interpretation of manufacturer's data sheets for installation of hardware
   - Specific techniques for shaping wood and wood-based products
   - Adjustment of cutting speed to avoid chips and burrs
   - Use of pre-programmed numerical control machine tool: installation of cutting tools, choice of program, installation of part and machining
   - Techniques for working with portable tools

4. Install the hardware.

   - Installation techniques
   - Connection between the hardware and the tools to be used
   - Inspection of movement of components: sufficient play, appropriate rotation, etc.

5. Assemble the components.

   - Movement of solid wood
   - Techniques associated with the principal traditional and modern assembly methods
   - Use of the appropriate tools for each assembly method
   - Assembly of parts of each component, such as drawers, and assembly of components

6. Prepare the furniture for staining, if applicable.

   - Appropriate choice of operations: sanding, assembly and disassembly, etc.
   - Sanders: 3 x 24-in., orbital, pneumatic, electric, square, half-sheet, etc.
   - Choice of sandpaper
   - Sanding method and techniques
   - Qualities of proper sanding and cleaning

7. Ensure the quality of the assembly.

   - Qualities of proper assembly: solidity, cleanliness and effectiveness of method
   - Quality control procedures and criteria: measurements, mobility of parts, compliance with drawing, preparation for finishing, etc.

8. Maintain the work area and equipment.

   - Specific maintenance for portable tools
   - Application of knowledge related to the element *Shape parts* covered in previous competencies

Patterns, Templates, Jigs and Fixtures	Code: 773372

Competency 7 Duration 30 hours Credit 2

Behavioural Competency

Statement of the Competency	**Achievement Context**
Make patterns, templates, jigs and fixtures.	• In a workshop • Working as part of a team • For tracing, machining and clamping • Given drawings, a cutting list, instructions and procedures • Using the necessary equipment and materials, including a pre-programmed numerical control machine tool

Elements of the Competency	**Performance Criteria**
1. Analyze the project data.	• Appropriate verification of accuracy of data • Correct decision regarding the use of patterns, templates, jigs or fixtures
2. Implement the required safety measures.	• Appropriate identification of potential risks and their impact on health and safety • Determination of safety measures • Conscientious verification and installation of safety accessories on the machines • Concern for the safe use of the pattern, template, jig or fixture
3. Design the pattern, template, jig or fixture.	• Identification of the various factors involved in the design • Accurate determination of the shape and size of the pattern, template, jig or fixture • Representation in a precisely dimensioned sketch • Creation of an explicit data sheet
4. Prepare to make the pattern, template, jig or fixture.	• Proper establishment of cutting list • Correct choice of materials, fasteners and equipment • Safe adjustment of guides and safety accessories • Precise marking out of axes and contours on the material
5. Shape and assemble the pattern, template, jig or fixture.	• Use of appropriate techniques • Meticulous compliance with layout • Adjustment of all safety elements • Effective use of equipment

6. Test the pattern, template, jig or fixture.	• Appropriate adjustments to ensure the solidity of the parts • Safe and functional pattern, template, jig or fixture • Compliance of machined part with drawing
7. Finish and catalogue the pattern, template, jig or fixture.	• Correct application of finishing agent • Observance of cataloguing instructions
8. Maintain the work area and equipment.	• Clean and tidy work area • Appropriate maintenance of equipment • Disposal or recovery of waste in accordance with instructions
	For the competency as a whole: • Consistent application of occupational health and safety rules • Ergonomic work posture • Concern for the economical use of materials • Systematic application of procedure

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each element of the competency, along with their attendant guidelines.

For the competency as a whole:

- Terminology related to patterns, templates, jigs and fixtures
- Compliance with rules regarding the economical use of materials and quality control at every step
- Specific attitude required for this competency: concern for excellence

1. Analyze the project data.
   - Procedure for verifying drawing
   - Data needed to make the pattern, template, jig or fixture
   - Types of patterns, templates, jigs and fixtures and their uses: clamping, machining, shaping

2. Implement the required safety measures.

   See appendix for the occupational health and safety risks listed in the job analysis report.
   - Risk sources
   - Effects on health and safety
   - Preventive measures

3. Design the pattern, template, jig or fixture.

   - Factors to consider when designing a pattern, template, jig or fixture:
     – surface of the part to be made
     – surface used by the retaining and handling systems
     – clamping or moulding processes
     – machines used to manufacture the product
     – potential difficulties and alternatives
     – ergonomic work posture for cabinetmaker, etc.
   - Marking out of shapes and dimensions on paper
   - Data to be included on the manufacturing data sheet

4. Prepare to make the pattern, template, jig or fixture.

   - Application of knowledge covered in *Taking Measurements and Doing Calculations*
   - Specific equipment for the pattern, template, jig or fixture
   - Materials and fasteners to be used and not to be used in patterns, templates, jigs and fixtures
   - Required safety measures

5. Shape and assemble the pattern, template, jig or fixture.

   - Application of shaping and assembly techniques covered previously
   - Cutting out and calibration of shapes
   - Installation of various retaining, safety and handling systems
   - Adjustment of parts in the pattern, template, jig or fixture: axes and reference lines

6. Test the pattern, template, jig or fixture.

   - Safe installation
   - Aspects to verify in order to improve the pattern, template, jig or fixture:
     – safe attachment of parts to the support
     – proper functioning of pattern, template, jig or fixture
     – compliance of machined part with drawing
   - Corrections and adjustments

7. Finish and catalogue the pattern, template, jig or fixture.

   - Choice of finishing agent
   - Cataloguing method: project, use, step, symbols, etc.

8. Maintain the work area and equipment.

   - Application of knowledge related to the element *Shape parts* covered in previous competencies
   - Method for filing and storing patterns, templates, jigs and fixtures

Impact of Finishing Processes on Manufacturing	Code: 773384

Competency 8 Duration 60 hours Credits 4

Behavioural Competency

Statement of the Competency

Analyze the impact of finishing processes on manufacturing.

Achievement Context

- Working alone
- When staining or applying a finishing agent to furniture
- Using the finishing data sheet
- Using the product data sheet

Elements of the Competency	Performance Criteria
1. Become familiar with the type of finish requested.	• Accurate identification of finishing processes • Accurate distinction between the products to be used • Appropriate assessment of the risks associated with the products • Appropriate determination of health and safety measures
2. Predict the impact of sanding on the required finish.	• Identification of the quality of the sanding required • Accurate prediction based on the materials and products
3. Test the sanding and finishing processes.	• Identification of safety measures required in the finishing shop • Proper preparation of surfaces • Observance of techniques and sequence of application for the process in question • Appropriate use of equipment • Observance of drying time • Appropriate sanding of finishing agent • Appropriate and correct polishing technique • Thorough cleaning of work area
4. Take the finish into account during the preliminary assembly.	• Appropriate determination of the feasibility of disassembling and reassembling the furniture • Correct anticipation of areas that will no longer be accessible at the finishing stage • Accurate anticipation of potential problems • Relevant solutions to the problems anticipated

5. Check the compliance of the finish with the order.	• Careful inspection of checkpoints • Attentive examination *For the competency as a whole:* • Consistent application of environmental protection and health and safety rules • Systematic application of work steps and procedures • Concern for the economical use of products

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each element of the competency, along with their attendant guidelines.

For the competency as a whole:

- Terminology related to finishing
- Finishing equipment: paint brushes, rags and spraying and ventilation systems
- Steps in the finishing process
- Specific attitude required for this competency: methodical approach to work, in order to be able to follow instructions on the data sheet
- Methods for using products economically

1. Become familiar with the type of finish requested.
    - Finishing processes: staining and applying a finishing agent
    - Information needed: characteristics of the requested finish, surface preparation, etc.
    - Products: name, composition, characteristics and properties, colours available, etc.

2. Predict the impact of sanding on the required finish.
    - Association of sanding techniques with types of finishes
    - Materials to be used depending on the type of sanding
    - Problems to be avoided

3. Test the sanding and finishing processes.
    - Safety measures to take: special attention to wool clothing, ambient dust, silicone-based products, body hygiene, etc.
    - Quality control of surfaces before finishing: even surfaces; uniform porosity; no traces of glue, air bubbles or stains; etc.
    - Use of equipment
    - Appropriate staining techniques for the product: stains, alcohol-based stains, spray (NGR) stains, inks, glazes, hand-wiped stains, etc.
    - Finishing agents: waxes, varnishes and lacquers
    - Accurate proportions in the finishing agent
    - Appropriate drying time for the products
    - Polishing techniques aimed at producing a matte or glossy finish

4. Take the finish into account during the preliminary assembly.
    - Potential problems during finishing: inaccessible areas, hardware, unstained joints, excess glue, etc.
    - Possible solutions
    - Precautions to take when disassembling, cleaning and masking furniture

5. Check the compliance of the finish with the order.
    - Checkpoints
    - Quality criteria

Making Drawings	Code: 773395

Competency 9 Duration 75 hours Credits 5

Behavioural Competency

Statement of the Competency	**Achievement Context**
Make technical drawings.	• For modelling products in three dimensions • Given an illustration or a sketch of the product • Using a computer and modelling software
Elements of the Competency	**Performance Criteria**
1. Prepare the work.	• Ergonomic installation of workstation • Correct choice of method for presenting the two-dimensional drawing in perspective • Proper planning of construction sequence in three dimensions • Appropriate modifications to variables in the overlays
2. Draw the parts of the product.	• Proper breakdown of drawing to determine the basic solid shapes • Accurate extrusion of irregular shapes • Optimum use of commands for combining and subtracting • Appropriate modification of existing shapes
3. Assemble the parts of the product.	• Appropriate insertion of blocks to provide a comprehensive view • Observance of reference points during insertion
4. Format the drawing.	• Appropriate location and orientation of drawings on the sheet • Appropriate choice of views and sections • Appropriate control of visibility of layers in the views • Correct location of dimensions on the drawing • Appropriate control of visibility and density of grid
5. Finish the work.	• Appropriate drawings printed • Files and drawings filed in accordance with instructions • Appropriate cleaning and tidying of work area

For the competency as a whole:

- Appropriate use of software functions
- Appropriate choice of modelling commands
- Observance of drawing conventions
- Agreement of views and details
- Creative use of software functions

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each element of the competency, along with their attendant guidelines.

For the competency as a whole:

- Terminology specific to modelling software
- Application of general drawing vocabulary and conventions covered in *Interpreting Drawings*
- Basic software functions, modification and adjustment of shapes
- Risks present in the workplace: workstation ergonomics and the pressure of deadlines (see appendix)
- Specific attitude required for this competency: creativity, in order to come up with and represent objects so that they are easy to understand

1. Prepare the work.
    - Downloading of software
    - Configuration of software for cabinetmaking
    - Choice of scale and establishment of variables
    - Ergonomic workstation

2. Draw the parts of the product.
    - Basic shapes in plane geometry
    - Drawing basic shapes in spatial geometry
    - Importance of spatial perception of the product

3. Assemble the parts of the product.
    - Creation of blocks, layovers and formatting
    - Visualization of the various adjustments
    - Modification of certain dimensional parameters
    - Formatting of textures, colours and shading

4. Format the drawing.
    - Organization of documents by type of representation
    - Renderings, three-dimensional drawing or technical drawing, as needed

5. Finish the work.
    - Importance of checking the drawings
    - Printing procedure
    - Procedure for closing and archiving drawings

Making Straight Furniture Out of Solid Wood	Code: 773406

Competency 10 Duration 90 hours Credits 6

Behavioural Competency

Statement of the Competency

Make a straight piece of furniture out of solid wood.

Achievement Context

- In a workshop
- Working as part of a team
- Making a basic piece of furniture
- Given a drawing
- Given a cutting list and procedures
- Using the necessary equipment and materials

Elements of the Competency	Performance Criteria
1. Become familiar with the work to be done.	• Accurate interpretation of drawing • Determination of the necessary materials, patterns, templates, jigs, fixtures and equipment • Search for relevant technical data on fastening and fasteners
2. Implement the required safety measures.	• Appropriate identification of potential risks and their impact on health and safety • Determination of safety measures • Conscientious verification and installation of safety accessories on the machines
3. Prepare the materials, equipment, patterns, templates, jigs and fixtures needed.	• Appropriate choice of materials based on the cutting list • Appropriate adjustment of machine tools • Conscientious installation of cutting tools, guides and safety accessories • Production of precise and appropriate patterns, templates, jigs and fixtures
4. Shape the wood parts.	• Performance of a conclusive test using the patterns, templates, jigs and fixtures • Methodical execution of the various operations • Proper use of techniques • Meticulous monitoring of the quality and compliance of parts
5. Stain the wood.	• Uniform sanding • Careful removal of dust • Appropriate application of stain

6. Assemble the piece of furniture.	• Appropriate inspection of parts before assembly • Observance of hardware installation methods specific to solid wood • Use of appropriate assembly techniques • Appropriate adjustments to ensure the mobility of the parts
7. Control the quality of the piece of furniture.	• Precise measurements • Compliance with drawing and quality requirements • Appropriate final cleaning • Appropriate preparation for finishing
8. Maintain the work area and equipment.	• Clean and tidy work area • Appropriate maintenance of equipment • Disposal or recovery of waste in accordance with instructions
	For the competency as a whole: • Consistent application of occupational health and safety rules • Ergonomic work posture • Concern for the economical use of materials • Systematic application of procedure • Demonstration of the attitudes required to work well in a team

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each element of the competency, along with their attendant guidelines.

For the competency as a whole:

- Terminology specific to the product
- Manufacturing procedure specific to the product
- Compliance with rules regarding the sharing of perceptions with teammates using sketches, the economical use of materials, etc.
- Specific attitudes required for this competency: open-mindedness and flexibility, in order to work well in a team

1. Become familiar with the work to be done.

    - Application of knowledge covered in *Interpreting Drawings* and *Taking Measurements and Doing Calculations*
    - Specific characteristics of types of wood and mechanical properties of the types of wood used to make the furniture
    - Technical data on fastening methods and fasteners

2. Implement the required safety measures.

   See appendix for the occupational health and safety risks listed in the job analysis report.
   - Risk sources
   - Effects on health and safety
   - Preventive measures

3. Prepare the materials, equipment, patterns, templates, jigs and fixtures needed.
   - Choice of materials based on the types, quality and quantity of wood required
   - Adjustment of equipment and cutting tools for the job
   - Construction of the necessary patterns, templates, jigs or fixtures

4. Shape the wood parts.
   - Specific method for shaping the product
   - Procedure for testing patterns, templates, jigs and fixtures
   - Quality and compliance requirements of parts

5. Stain the wood.
   - Application of pre-finishing sanding and cleaning techniques
   - Choice of parts to be stained
   - Specific techniques for staining the product

6. Assemble the piece of furniture.
   - Pre-assembly inspection: measurements, quantity and quality of parts
   - Installation and adjustment of hardware on the wood
   - Specific assembly methods for the product

7. Control the quality of the piece of furniture.
   - Final quality control procedure and criteria
   - Preparation for finishing

8. Maintain the work area and equipment.
   - Application of knowledge related to the element *Shape parts* covered in previous competencies

Veneering and Laminating Materials	Code: 773412

Competency 11 Duration 30 hours Credits 2

Behavioural Competency

Statement of the Competency	**Achievement Context**
Veneer and laminate materials.	• In a workshop • Given a drawing • Given pre-established quality criteria • Using sheets of wood and laminate • Using glues and other necessary materials • Using the necessary equipment

Elements of the Competency	**Performance Criteria**
1. Become familiar with the work to be done.	• Appropriate verification of the cutting list and drawing • Appropriate selection of veneers and laminates • Availability of materials and equipment
2. Implement the required safety measures.	• Appropriate identification of potential risks and their impact on health and safety • Determination of safety measures • Conscientious verification and installation of safety accessories on the machines
3. Prepare the veneers and laminates.	• Appropriate preparation of equipment • Clean cutting of veneers and laminates • Appropriate matching of pattern illustrated in the drawing • Imperceptible joints
4. Glue the veneer or laminate to the support.	• Use of appropriate techniques • Compliance with reference lines in the drawing
5. Trim the surfaces.	• Observance of techniques • Absence of roughness on edges or surfaces
6. Sand surfaces as needed.	• Proper use of equipment • Elimination of all excess glue
7. Inspect the veneering and laminating.	• Meticulous inspection of all checkpoints • Compliance with drawing and quality requirements

8. Maintain the work area and equipment.	• Clean and tidy work area • Appropriate maintenance of equipment • Disposal or recovery of waste in accordance with instructions
	For the competency as a whole:
	• Consistent application of occupational health and safety rules • Systematic application of veneering and laminating processes • Clean veneering and laminating • Careful work

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each element of the competency, along with their attendant guidelines.

For the competency as a whole:

- Terminology related to veneering and laminating
- Equipment used for veneering and laminating: guillotines, band saws, hot and cold presses, routers, various sanders, edge banders, calibration sanders
- Steps in the veneering and laminating processes
- Compliance with rules regarding the economical use of materials, accurate measurements and quality control at every step
- Specific attitude required for this competency: meticulousness, for the precise execution of each operation

1. Become familiar with the work to be done.

   - Specific features of drawings related to veneering and laminating and the requested pattern
   - Various wood and laminate veneers and their characteristics
   - Criteria for choosing an appropriate support
   - Type of presses and gluing methods

2. Implement the required safety measures.

   See appendix for the occupational health and safety risks listed in the job analysis report.
   - Risk sources
   - Effects on health and safety
   - Preventive measures

3. Prepare the veneers and laminates.

   - Machine and hand cutting
   - Edge-to-edge and end-to-end matching
   - Fitting, sizing and assembly techniques
   - Importance of making sure that the pattern corresponds to the reference lines

4. Glue the veneer or laminate to the support.

    - Types of glues
    - Fastening techniques: quantity of glue, sufficient pressure and heat
    - Duration of pressing
    - Use of pressure: cold, negative, hot pressing, etc.
    - Veneering and laminating of edges

5. Trim the surfaces.

    - Use of hand tools: files, rasps, cabinetmaker's files, scrapers, etc.
    - Use of portable tools: trimmers, routers, sanders, etc.
    - Use of stationary machine tools: band saws, edge sanders, etc.
    - Qualities of proper trimming

6. Sand surfaces as needed.

    - Application of knowledge covered in *Impact of Finishing Processes on Manufacturing* based on the materials in question
    - Surface inspection criteria
    - Use of hand or portable tools or stationary machine tools, depending on the surface

7. Inspect the veneering and laminating.

    - Quality criteria: no sanding through, roughness or air bubbles; correct alignment of reference lines; etc.
    - Quality control procedure for veneering and laminating and any needed corrections

8. Maintain the work area and equipment.

    - Application of knowledge related to the element *Shape parts* covered in previous competencies

Making Panel Furniture	Code: 773426

Competency 12 Duration 90 hours Credits 6

Behavioural Competency

Statement of the Competency

Make panel furniture.

Achievement Context

- In a workshop
- Working as part of a team
- Making basic furniture with doors and drawers, such as a night table or a medicine cabinet
- Given a drawing
- Given a cutting list and procedures
- Given pre-established quality criteria
- Using the necessary equipment and materials

Elements of the Competency	Performance Criteria
1. Become familiar with the work to be done.	• Accurate interpretation of drawing • Determination of the necessary materials, patterns, templates, jigs, fixtures and equipment • Location of relevant technical data on fastening and fasteners
2. Implement the required safety measures.	• Appropriate identification of potential risks and their impact on health and safety • Determination of safety measures • Conscientious verification and installation of safety accessories on the machines
3. Prepare the materials and equipment.	• Appropriate choice of materials based on the cutting list • Appropriate adjustment of machine tools • Conscientious installation of cutting tools, guides and safety accessories • Use of appropriate patterns, templates, jigs or fixtures
4. Veneer or laminate the materials.	• Appropriate preparation of veneers or laminates • Observance of veneering, laminating and trimming techniques • Compliance with drawing and quality requirements
5. Shape the panels.	• Performance of a conclusive test using the patterns, templates, jigs and fixtures • Methodical execution of the various operations • Proper use of the relevant techniques • Meticulous monitoring of the quality and compliance of parts

6. Prepare the furniture for finishing.	• Determination of the appropriate operations • Careful, meticulous application of techniques • Surfaces in accordance with quality requirements • Transfer of furniture to finishing according to instructions
7. Assemble the piece of furniture after finishing.	• Thorough inspection of parts before assembly • Observance of hardware installation methods specific to panel furniture • Use of appropriate assembly techniques • Appropriate adjustments to ensure the mobility of the parts
8. Inspect the piece of furniture.	• Precise measurements • Compliance with drawing and quality requirements • Appropriate final cleaning
9. Maintain the work area and equipment.	• Clean and tidy work area • Appropriate maintenance of equipment • Disposal or recovery of waste in accordance with instructions
	For the competency as a whole: • Consistent application of occupational health and safety rules • Ergonomic work posture • Concern for the economical use of materials • Systematic application of procedure • Meticulous control of quality and compliance throughout the process • Ability to make appropriate work-related decisions

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each element of the competency, along with their attendant guidelines.

For the competency as a whole:

- Terminology specific to panel furniture
- Specific manufacturing procedure for the product
- Discussion of perceptions within the group, using sketches or drawings
- Compliance with rules regarding the economical use of materials and quality control at every step
- Specific attitude required for this competency: sense of responsibility, i.e. the ability to make informed decisions within the limits of their area of responsibility

1. Become familiar with the work to be done.
   - Specific requirements of the competency
   - Types of panels available on the market: melamine, different thicknesses of laminate, pressed wood, softboard, medium-density fibreboard (MDF), high-density fibreboard, cellular board, etc.
   - Materials that meet criteria specific to the aerospace industry
   - Special equipment: panel saws, edging machines, etc.
   - Useful hardware for panels

2. Implement the required safety measures.

   See appendix for the occupational health and safety risks listed in the job analysis report.
   - Risk sources
   - Effects on health and safety
   - Preventive measures

3. Prepare the materials and equipment.
   - Criteria for choosing panels for the job
   - Specific equipment adjustments depending on the materials used
   - Criteria for choosing the appropriate patterns, templates, jigs or fixtures

4. Veneer or laminate the materials.
   - Application of knowledge covered in *Veneering and Laminating Materials*
   - Use of backing in obscured areas

5. Shape the panels.
   - Application of work steps covered previously: measuring, marking out, cutting, gluing, machining
   - Specific methods and techniques for panels
   - Methods for handling panels
   - Shaping panels methodically, as part of a team

6. Prepare the furniture for finishing.
   - Choice of parts to be stained
   - Application of knowledge about sanding and masking covered in *Impact of Finishing Processes on Manufacturing*
   - Importance of following the procedure for preparing the furniture
   - Protecting the furniture: installing glides, protective corners, etc.
   - Transportation and storage methods

7. Assemble the piece of furniture after finishing.
   - Specific assembly methods for the furniture
   - Importance of taking precise measurements before assembly
   - Installation and adjustment of specific hardware for panel furniture
   - Final inspection of the various elements

8. Inspect the piece of furniture.
   - Final quality control procedure and criteria

9. Maintain the work area and equipment.
   - Application of knowledge related to the element *Shape parts* covered in previous competencies

Planning the Manufacturing of a Product	Code: 773432

Competency 13 Duration 30 hours Credits 2

Behavioural Competency

Statement of the Competency	**Achievement Context**
Plan the manufacturing of a product.	• Given a drawing and specifications • Given data sheets for the hardware and equipment • Given forms • Using a computer • Using a planning table
Elements of the Competency	**Performance Criteria**
1. Analyze the specific manufacturing details.	• Accurate differentiation of materials in the specifications based on their quality • Identification of quality standards and requirements • Accurate anticipation of expected results • Proposal of relevant solutions
2. Establish a cutting list.	• Accurate information • Clear depiction of irregularly shaped parts
3. Establish the manufacturing procedure.	• Logical sequence of operations • Correct estimate of time required for each step • Determination of safety measures for each step
4. Draw a cutting pattern.	• Consideration of wood grain or laminate pattern • Observance of technical data • Minimal loss
5. Make sure that the resources are available.	• Accurate planning of the necessary internal and external resources • Location of the appropriate hardware • Mobilization of resources at the appropriate time • Conscientious verification of the quantity and quality of materials • Proper inspection of equipment
6. Convey the information to the people concerned.	• Relevant, comprehensive and accurate information • Clear planning sheets distributed • Appropriate instructions to avoid risks • Appropriate validation of understanding

For the competency as a whole:

- Methodical work performed with concentration and perseverance
- Accurate planning calculations and data

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each element of the competency, along with their attendant guidelines.

For the competency as a whole:

- Terminology related to planning
- Steps in the planning process
- Approaches aimed at improving productivity
- Specific attitude required for this competency: perseverance, in order to anticipate the smallest manufacturing details

1. Analyze the specific manufacturing details.

    - Analysis of drawings and specifications
    - Application of knowledge about wood and related products covered previously
    - Application of shaping and assembly techniques covered previously
    - Problem-solving method

2. Establish a cutting list.

    - Application of knowledge covered in *Taking Measurements and Doing Calculations*
    - Calculation of quantities required and losses
    - Qualities of a good cutting list: clear, accurate data

3. Establish the manufacturing procedure.

    - Elements that make up a manufacturing data sheet: project, names of components and parts, quantities, dimensions, types of materials, sketches, equipment, etc.
    - Logical sequence of operations and estimate of time required
    - Assembly elements, safety elements, special assemblies, etc.
    - Method for filling out manufacturing data sheets clearly and accurately

4. Draw a cutting pattern.

    - Technical data to consider: dimensions, materials used, wood grain, patterns in the raw materials, etc.
    - Transposition of required cuts: transfer of reference lines and guidelines, wood grain, etc.
    - Method for optimizing the use of materials
    - Use of software to generate cutting patterns

5. Make sure that the resources are available.

    - Internal and external resources needed: materials, equipment, work spaces, labour, patterns, templates, jigs, fixtures, etc.
    - Technical data sheet for hardware required based on the drawing
    - Method for mobilizing resources
    - Method for verifying the quality and quantity of resources
    - Risks associated with the need to visit the workshop (see appendix)

6. Convey the information to the people concerned.

    - Method for recording information so that everyone has the same vision of the manufacturing process
    - Importance of the quality of the information conveyed
    - Emphasis on health and safety measures
    - Openness to others' comments and perceptions
    - Constructive feedback

Manufacturing Commercial, Industrial or Institutional Furniture	Code: 773448

Competency 14 Duration 120 hours Credits 8

Behavioural Competency

Statement of the Competency	**Achievement Context**
Manufacture commercial, industrial or institutional furniture.	• In a workshop • Working as part of a team • As part of a serial production process • Given the necessary drawings • Using the necessary equipment and materials, including a pre-programmed numerical control machine tool

Elements of the Competency	**Performance Criteria**
1. Plan the work.	• Proper validation of the feasibility of the product • Appropriate solutions to the company's needs • Relevant research on new materials • Establishment of a detailed cutting list • Cutting pattern optimizing the use of materials • Logical sequence of operations • Mobilization of the necessary resources at the appropriate time
2. Implement the required safety measures.	• Appropriate identification of potential risks and their impact on health and safety • Determination of safety measures • Conscientious verification and installation of safety accessories on the machines
3. Prepare the materials, equipment, patterns, templates, jigs and fixtures needed.	• Appropriate selection of materials • Appropriate preparation of the necessary equipment, patterns, templates, jigs and fixtures • Appropriate veneering or laminating for the materials used and compliance with drawing • Use of appropriate preparation techniques for the materials used
4. Manufacture the furniture.	• Appropriate preparation of prototype • Techniques and work methods appropriate for the type of project • Appropriate use of equipment given the materials used • Appropriate preparation of components requiring staining

5. Control the quality of the product.	• Precise measurements • Compliance of parts with drawing and quality requirements
6. Solve production problems.	• Appropriate analysis of the factors involved • Search for different solutions • Productive discussions with the team • Feasibility of the chosen solution • Appropriate validation with the people concerned
7. Maintain the work area and equipment.	• Clean and tidy work area • Appropriate maintenance of equipment • Disposal or recovery of waste in accordance with instructions
	For the competency as a whole: • Consistent application of occupational health and safety rules • Ergonomic work posture • Concern for the economical use of materials • Systematic application of procedure • Precise measurements • Appropriate use of drawing techniques • Meticulous control of quality and compliance throughout the process • Special attention paid to materials, equipment and the team

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each element of the competency, along with their attendant guidelines.

For the competency as a whole:

- Terminology related to commercial, industrial and institutional furniture
- Manufacturing procedure specific to the product
- Discussion of perceptions within the group, using sketches or drawings
- Compliance with rules regarding the economical use of materials, quality control at every step, and attention to materials, equipment and the team
- Creative search for solutions
- Company's quality standards
- Specific attitude required for this competency: observance of their capabilities and limitations and those of their teammates

Manufacturing Commercial, Industrial or Institutional Furniture	Code:	773448

1. Plan the work.

   - Specific details concerning project planning
   - Application of knowledge covered in *Planning the Manufacturing of a Product*
   - Verification of the feasibility of the furniture: measurements, feasibility of assembly and disassembly, list of hardware, raw materials, sequence of operations, tools and equipment
   - Related materials (cellular board, plastic composites, etc.) and new materials

2. Implement the required safety measures.

   See appendix for the occupational health and safety risks listed in the job analysis report.
   - Risk sources
   - Effects on health and safety
   - Preventive measures

3. Prepare the materials, equipment, patterns, templates, jigs and fixtures needed.

   - Properties of the materials used for the project
   - Equipment, patterns, templates, jigs and fixtures needed for the project
   - Application of knowledge covered in *Veneering and Laminating Materials,* based on the requirements of the drawing
   - Techniques for preparing materials for the product in question

4. Manufacture the furniture.

   - Importance of the prototype in serial production
   - Application of knowledge and skills previously covered: drawing, measurements and calculations, shaping, assembly
   - Specific manufacturing techniques for the materials used and the product to be manufactured
   - Use of a pre-programmed numerical control machine tool
   - Methods for taking notes for purposes of providing feedback

5. Control the quality of the product.

   - Quality control procedure and criteria
   - Checkpoints: manufacturing process, compliance, product quality

6. Solve production problems.

   - Teamwork methods used in companies
   - Methods for solving disputes in a team
   - Problem-solving process

7. Maintain the work area and equipment.

   - Application of knowledge related to the element *Shape parts* covered in previous competencies

Manufacturing and Installing Kitchens	Code: 773457

Competency 15 Duration 105 hours Credits 7

Behavioural Competency

Statement of the Competency	Achievement Context
Manufacture and install modular kitchen components.	• In a workshop • Working as part of a team • Given the drawings and specifications for a residential renovation project • Using the necessary equipment and materials

Elements of the Competency	Performance Criteria
1. Plan the work.	• Search for realistic solutions to ensure the feasibility of the project • Precise measurement of site • Accurate calculations • Accurate planning of demolition of existing kitchen and installation constraints • Realistic planning of manufacturing • Mobilization of the necessary resources at the appropriate time
2. Implement the required safety measures.	• Appropriate identification of potential risks and their impact on health and safety • Determination of safety measures • Conscientious verification and installation of safety accessories on the machines
3. Prepare the materials, equipment, patterns, templates, jigs and fixtures needed.	• Appropriate selection of materials • Appropriate preparation of the necessary equipment, patterns, templates, jigs and fixtures • Appropriate veneering or laminating for the materials used and compliance with drawings and specifications • Use of appropriate preparation techniques for the materials used
4. Manufacture the modules.	• Shaping of parts and hardware preparations in accordance with drawing • Proper use of numerical control machine tool • Methodical execution of assembly operations • Appropriate installation of hardware and mechanisms • Appropriate preparation of components requiring staining

5. Shape the counters.	• Appropriate analysis of specific manufacturing details • Application of specific laminating techniques for the materials used • Compliance with drawing
6. Prepare the components for installation.	• Appropriate pre-assembly and adjustments • Accurate identification of parts • Protective packaging of the product • Thorough cleaning of work area and equipment
7. Install the modules on site.	• Appropriate preparation of site • Accurate inventory of components delivered • Thorough planning of installation • Precise levelling • Precise adjustment of modules during preliminary assembly • Solid and safe fastening of modules • Meticulous adjustment of moving parts • Precise installation of mouldings and other decorative elements, as applicable
8. Clean and tidy up the work area.	• Cleanliness of modules and site • Proper disposal or recycling of packaging materials and waste
	For the competency as a whole: • Consistent application of occupational health and safety rules • Ergonomic work posture • Concern for the economical use of materials • Systematic application of procedure • Precise measurements • Appropriate use of drawing techniques • Meticulous control of quality and compliance throughout the process • Special attention paid to materials, equipment and the client • Demonstration of creativity in finding appropriate and realistic solutions

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each element of the competency, along with their attendant guidelines.

For the competency as a whole:

- Terminology specific to the manufacturing and installation of kitchen products
- Specific manufacturing procedure for the product
- Discussion of perceptions within the team, using sketches or drawings
- Compliance with rules regarding the company's quality standards, and attention to materials, equipment, the team and the client's needs
- Methods for updating their knowledge of materials, hardware, work methods, equipment, etc.
- Application of knowledge concerning creativity covered in *Manufacturing Commercial, Industrial or Institutional Furniture*, in order to find solutions and develop their ingenuity

1. Plan the work.

   - Specific details concerning project planning
   - Application of knowledge covered in *Planning the Manufacturing of a Product*
   - Aspects to check in the drawings and specifications concerning the feasibility of manufacturing the product: moving parts, direction of door openings, space occupied by the modules at the site, etc.
   - Precautions to take when taking measurements on site: plumbing, electricity, levels, walls, floor, etc.
   - Calculation of surfaces of different geometric shapes and of volumes
   - Constraints to anticipate when disassembling and installing the modules

2. Implement the required safety measures.

   See appendix for the occupational health and safety risks listed in the job analysis report.
   - Risk sources
   - Effects on health and safety
   - Preventive measures

3. Prepare the materials, equipment, patterns, templates, jigs and fixtures needed.

   - Properties of materials used for modular components
   - Equipment, patterns, templates, jigs and fixtures needed for the project
   - Techniques for preparing materials for the product in question
   - Application of knowledge covered in *Veneering and Laminating Materials,* based on the requirements of the drawing

4. Manufacture the modules.

   - Application of knowledge and skills covered previously: using drawings, measurements and calculations, shaping, assembly, preparation for staining
   - Specific techniques for making kitchen modules
   - Use of a pre-programmed numerical control machine tool
   - Adjustment of hardware and mechanisms for moving doors, lighting, plumbing, recycling bins, garbage cans, etc.

5. Shape the counters.

   - Different counter materials: metal finish, stainless steel, marble and related materials
   - Specific laminating and manufacturing techniques for kitchen counters
   - Principal adjustments required

6. Prepare the components for installation.

   - Procedures and techniques for pre-assembling, packaging and transporting components
   - Verification of operation of mechanisms
   - Presence of all kitchen components
   - Conventions for identifying components
   - Application of knowledge covered previously concerning cleaning and tidying up the workshop

7. Install the modules on site.

   - Possible problems and solutions: nailing base, electricity, pipes, unforeseen events and surprises
   - Logical sequence for installing modules to ensure efficiency
   - Inspection and unpacking of modules to ensure that they are not damaged
   - Method for installing modules: levelling, adjustments, fastening, etc.
   - Calculation and cutting of mouldings and other decorative elements

8. Clean and tidy up the work area.

   - Cleanliness to preserve the company's image
   - Importance of disposing of packaging materials in an environmentally friendly manner

Exploring Traditional and Innovative Techniques	Code: 773468

Competency 16 Duration 120 hours Credits 8

Behavioural Competency

Statement of the Competency	**Achievement Context**
Explore traditional and innovative techniques.	• Given patterns and drawings • Using a computer • Using the necessary equipment and materials
Elements of the Competency	**Performance Criteria**
1. Find information about styles and new trends.	• Relevant sources of information • Appropriate historical information • Relevant information gathered
2. Experiment with special veneer matches, marquetry and carving techniques.	• Appropriate preparation of equipment and materials • Correct application of techniques and steps • Proper use of equipment • Observance of health and safety rules • Meticulous work • Compliance of product with initial pattern
3. Experiment with new products, materials, equipment or techniques.	• Correct anticipation of risks and associated safety measures • Accurate determination of the necessary operations and equipment • Safe use of equipment • Critical analysis of results • Realistic suggestions made to the people concerned
	For the competency as a whole: • Pertinent and well-organized notes taken • Demonstration of imagination and openness to innovations • Correct application of a problem-solving process • Thorough cleaning of work area and equipment

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each element of the competency, along with their attendant guidelines.

For the competency as a whole:

- Attitudes to develop: autonomy, curiosity, openness to innovations, sense of observation
- Application of a problem-solving process
- Specific attitude required for this competency: the necessary openness to explore and imagine new approaches

1. Find information about styles and new trends.
    - Sources of information and research methods
    - Impact of time and place on furniture styles: prehistory, antiquity, Middle Ages, Renaissance, golden age of European furniture, Modernism, contemporary art
    - Research on innovations: design, raw materials, hardware, equipment, techniques, etc.

2. Experiment with special veneer matches, marquetry and carving techniques.
    - Special veneer matches: definition, types, materials, equipment, techniques
    - Marquetry: definition, types, materials, equipment, techniques
    - Carving: definition, types, materials, equipment, techniques
    - Techniques for reproducing the initial patterns
    - Hand-eye coordination and meticulousness

3. Experiment with new products, materials, equipment or techniques.
    - Choice of innovations to try out: materials, equipment, work methods, assembly methods, etc.
    - Application of manufacturer's instructions
    - Application of health and safety rules
    - Recording of findings
    - Organization of information
    - Critical analysis: communication of their experience and impressions to the people concerned (manufacturer, management, work team, client in the case of self-employment, etc.) to determine the relevance of the innovation

Making Curved Furniture	Code: 773478

Competency 17 Duration 120 hours Credits 8

Behavioural Competency

Statement of the Competency	**Achievement Context**
Make curved furniture.	• In a workshop • Working as part of a team • On a project requiring the bending of a drawer or door, for example • Using a common bending process • Given a drawing • Given pre-established quality criteria • Using the necessary equipment and materials
Elements of the Competency	**Performance Criteria**
1. Plan the work.	• Relevant research on innovations • Consideration of the specific details of making curved furniture • Correct representation of curved parts in a drawing • Conscientious preparation of planning documents • Mobilization of the necessary resources at the appropriate time
2. Implement the required safety measures.	• Appropriate identification of potential risks and their impact on health and safety • Determination of safety measures • Conscientious verification and installation of safety accessories on the machines
3. Prepare the materials and equipment.	• Rigorous selection of materials, including those for the curved parts • Appropriate preparation of equipment • Appropriate veneering or laminating for the materials used and compliance with drawing
4. Shape the straight parts.	• Appropriate use of patterns, templates, jigs or fixtures • Application of the appropriate techniques and methods for the various operations • Meticulous monitoring of the quality and compliance of parts

5. Make the bending template.	• Accurate drawing of the shape and size of the template • Precise template • Performance of conclusive test • Appropriate finishing and cataloguing of template
6. Shape the curved parts.	• Correct application of bending process • Compliance of bending with the drawing and straight parts
7. Assemble the furniture.	• Thorough inspection of parts before assembly • Installation of hardware in compliance with data sheets • Use of appropriate assembly techniques • Appropriate adjustments to ensure the mobility of the parts • Meticulous preparation for finishing
8. Inspect the piece of furniture.	• Precise measurements • Compliance with drawing and quality requirements • Proper final cleaning
9. Maintain the work area and equipment.	• Clean and tidy work area • Appropriate maintenance of equipment • Disposal or recovery of waste in accordance with instructions
	For the competency as a whole: • Concern for the economical use of materials • Consistent application of occupational health and safety rules • Ergonomic work posture • Systematic application of procedure • Special attention paid to materials, equipment and the team • Resourcefulness and ingenuity in solving unusual problems

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each element of the competency, along with their attendant guidelines.

For the competency as a whole:

- Terminology related to bending
- Specific manufacturing procedure for the product
- Compliance with rules regarding the economical use of materials, accurate measurements, and special attention paid to equipment, materials and the team
- Specific attitude required for this competency: resourcefulness, in order to be able to overcome difficulties or solve unusual problems

1. Plan the work.

   - Specific details concerning project planning in the case of a curved piece of furniture
   - Application of knowledge covered in *Planning the Manufacturing of a Product*
   - Specific elements to validate on the bending drawing
   - Representation of the furniture's curves and the mould using a sketch or modelled drawing

2. Implement the required safety measures.

   See appendix for the occupational health and safety risks listed in the job analysis report.
   - Risk sources
   - Effects on health and safety
   - Preventive measures

3. Prepare the materials and equipment.

   - For the straight parts: application of knowledge covered previously
   - For the curved parts:
     – choice of materials based on their reaction to bending
     – processes: cold, negative, hot pressing; lamination; gluing; etc.
   - Selection of the appropriate equipment for the bending process

4. Shape the straight parts.

   - Application of techniques related to the element *Shape parts* covered in previous competencies

5. Make the bending template.

   - Types of templates: using a mould, a negative press, clamps, etc.
   - Factors to consider in designing the template: shape and surface of the part, surface used by the retaining and handling systems, frequency of use
   - Reproduction of drawing for the production of the calibre and bending template
   - Specific steps in the production of the template: forming, testing, finishing and cataloguing
   - Test: bent part compliant with drawing and the company's quality standards

6. Shape the curved parts.
    - Technique for veneering or laminating bent surfaces
    - Specific features of manufacturing involving bending: types of bending, properties of wood, types of glues, steaming time, clamping time and glue drying time
    - Steps in the bending process
    - Quality checkpoints
7. Assemble the furniture.
    - Application of techniques covered in *Assembling Furniture*
    - Specific techniques for assembling curved parts
8. Inspect the piece of furniture.
    - Quality control procedure and criteria specific to curved furniture
9. Maintain the work area and equipment.
    - Application of knowledge related to the element *Shape parts* covered in previous competencies

Manufacturing and Installing Architectural Products	Code: 773488

Competency 18 Duration 120 hours Credits 8

Behavioural Competency

Statement of the Competency	Achievement Context
Manufacture and install architectural products.	• In a workshop • Working as part of a team • Working on ornamental woodwork and other projects • For installation where permitted by regulation • Given project drawings and specifications and shop drawings • Using the necessary equipment and materials, including a pre-programmed numerical control machine tool

Elements of the Competency	Performance Criteria
1. Plan the work.	• Precise measurement of site • Accurate calculations • Proper validation of the feasibility of the product • Appropriate solutions for the client's specific needs • Relevant research on the specific manufacturing details for the product • Establishment of a detailed cutting list • Logical sequence of operations • Mobilization of the necessary resources at the appropriate time
2. Implement the required safety measures.	• Appropriate identification of potential risks and their impact on health and safety • Determination of safety measures • Conscientious verification and installation of safety accessories on the machines
3. Prepare the materials, equipment, patterns, templates, jigs and fixtures needed.	• Appropriate selection of materials • Appropriate preparation of the necessary equipment, patterns, templates, jigs and fixtures • Use of the appropriate veneering and laminating techniques for the raw materials used • Veneering and laminating in compliance with drawing

4. Shape the components of the product.	• Rigorous application of the appropriate methods and techniques for the product • Precise location of holes for assembly • Appropriate preparation of components requiring staining • Appropriate installation of hardware and mechanisms
5. Prepare the components for installation.	• Appropriate pre-assembly and adjustments • Accurate identification of parts • Protective packaging of the product • Thorough cleaning of work area and equipment
6. Install the architectural product on site.	• Appropriate preparation of site • Accurate inventory of components delivered • Thorough planning of installation • Sequential unpacking of components • Precise levelling • Precise adjustment of components during preliminary assembly • Meticulous adjustment of moving parts, as applicable • Precise installation of mouldings and other decorative elements, as applicable
7. Clean and tidy up the work area.	• Cleanliness of architectural product and work area • Proper disposal or recycling of packaging materials and waste
	For the competency as a whole: • Consistent application of occupational health and safety rules • Ergonomic work posture • Concern for the economical use of materials • Systematic application of procedure • Precise measurements • Appropriate use of drawing techniques • Meticulous control of quality and compliance throughout the process • Conscientious, responsible work

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each element of the competency, along with their attendant guidelines.

Two projects to be determined by the training centre:

- Principal project: panelling and woodwork for a residential or commercial building
- Secondary project: stair components, interior doors and windows, interior decoration of a boat or airplane, etc.

For the competency as a whole:

- Terminology related to architectural products
- Specific manufacturing procedure for the products
- Discussion of perceptions within the team, using sketches or drawings
- Compliance with rules regarding the economical use of materials, the company's quality standards, and attention to materials, equipment, the team and the client's needs
- Application of knowledge concerning creativity covered in *Manufacturing Commercial, Industrial or Institutional Furniture,* in order to find solutions and develop their resourcefulness
- Specific attitude required for this competency: commitment, in order to act conscientiously and responsibly with respect to the work done on the client's premises

1. Plan the work.

   - Specific details concerning project planning
   - Application of knowledge covered in *Planning the Manufacturing of a Product*
   - Precautions to take when taking measurements for the architectural product
   - Calculations for curved elements and other calculations covered previously
   - Aspects to check in the drawings and specifications concerning the feasibility of the project
   - Specific materials used in architectural products
   - Constraints to anticipate when disassembling and installing the components

2. Implement the required safety measures.

   See appendix for the occupational health and safety risks listed in the job analysis report.
   - Risk sources
   - Effects on health and safety
   - Preventive measures

3. Prepare the materials, equipment, patterns, templates, jigs and fixtures needed.

   - Properties of the materials used for the project
   - Equipment, patterns, templates, jigs and fixtures needed for the project
   - Application of knowledge covered in *Veneering and Laminating Materials,* based on the requirements of the drawing

4. Shape the components of the product.

    - Specific forming techniques and methods for the product
    - Use of a pre-programmed numerical control machine tool
    - Application of bending methods
    - Application of knowledge covered previously concerning aspects to consider when staining
    - Placement and installation of mechanisms: hardware, lighting, plumbing, etc.

5. Prepare the components for installation.

    - Specific adjustments for each product
    - Methods for packaging parts
    - Method for organizing parts for delivery in order to facilitate installation on site
    - Application of knowledge concerning cleaning and tidying up the workshop

6. Install the architectural product on site.

    - Regulations limiting installation
    - Organization of work and tips for effective installation
    - Installation problems: non-compliance of drawings with site, walls that have shifted, missing parts, forgotten tools, etc.
    - Levelling: ground level and sea level in the aerospace industry
    - Use of computers to calculate compound angles
    - Installation of mouldings and other decorative elements: picture rails, astragals, cornices, corbels, etc.

7. Clean and tidy up the work area.

    - Cleanliness for the company's image
    - Importance of disposing of packaging in an environmentally friendly manner

Developing Products	Code: 773494

Competency 19 Duration 60 hours Credits 4

Behavioural Competency

Statement of the Competency	**Achievement Context**
Help develop a product.	• Working as part of a team • Given a bid • Using a computer and drawing software

Elements of the Competency	**Performance Criteria**
1. Analyze the mandate.	• Accurate interpretation of client's needs • Relevant research on innovations • Appropriate identification of errors or omissions • Appropriate choice of raw materials • Establishment of a detailed cutting list • Appropriate name assigned to the project
2. Plan the manufacturing process.	• Establishment of a logical sequence of operations • Accurate determination of the necessary work spaces, equipment, patterns, templates, jigs and fixtures • Establishment of quality control steps based on the company's standards
3. Verify the technical feasibility of the product.	• Proposal of efficient work methods • Determination of the necessary safety measures • Determination and location of the appropriate hardware • Appropriate adjustments to the project
4. Produce shop drawings.	• Drawings meeting production needs • Appropriate conversion of some drawings to full-scale detail drawings
5. Estimate the cost of materials and manufacturing time.	• Identification of lowest cost for raw materials based on demand • Consideration of percentage loss • Appropriate estimate of time required for each operation • Determination of relevant external resources
6. Validate the technical design with the people concerned.	• Objective presentation of proposals • Appropriate justifications • Feasibility of the design

For the competency as a whole:

- Consideration of the company's resources
- Methodical work
- Demonstration of ingenuity and initiative in the proposal of realistic and effective solutions
- Accurate data
- Appropriate use of drawing techniques
- Receptivity and openness to teammates' comments
- Consideration of approaches aimed at improving productivity

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each element of the competency, along with their attendant guidelines.

For the competency as a whole:

- Terminology related to product development
- Discussion of perceptions within the team, using sketches or drawings
- Importance of proposing realistic solutions that take into account both the client's needs and the company's resources
- Approaches aimed at improving productivity, such as value-added production, continuous improvement, etc.
- Risks present in the workplace: workstation ergonomics and the pressure of deadlines (see appendix)
- Specific attitude required for this competency: initiative, in order to propose solutions and explore new approaches

1. Analyze the mandate.

    - Concepts related to customer service
    - Interpretation of need: consistency between idea, need and budget
    - Method for analyzing drawings and specifications for errors and omissions
    - Application of knowledge concerning cutting lists covered in *Planning the Manufacturing of a Product*
    - Properties of the raw materials used in the project
    - Method for naming and classifying projects

2. Plan the manufacturing process.

    - Specific details concerning project planning
    - Application of knowledge covered in *Planning the Manufacturing of a Product*
    - Shaping; assembly; pattern, template, jig or fixture preparation; finishing, veneering and laminating operations specific to the project
    - Calculation of work areas and storage areas for materials and finished products
    - Company's quality standards

3. Verify the technical feasibility of the product.
    - Application of knowledge previously covered concerning work methods, safety measures and the location of hardware
    - Procedure for correcting a project

4. Produce shop drawings.
    - Application of previously covered techniques concerning shop drawings
    - Method for making a detail drawing[2] for complex shaping

5. Estimate the cost of materials and manufacturing time.
    - Method for researching the cost of materials
    - Method for estimating manufacturing time
    - List of external resources and method for using them

6. Validate the technical design with the people concerned.
    - Importance of adequately meeting the client's need with respect to the product, costs and deadline
    - Quality criteria for a design: feasibility of product, quality-price ratio based on demand, choice of materials, etc.
    - Method for presenting and justifying proposals and receiving feedback

[2] Detail drawing: Finished drawing of a work in a given scale, usually 1:1, also called full-scale. It includes one or more projections of the work to be done and the different views making it easier to understand.

Technical Support and Prototyping	Code: 773504

Competency 20 Duration 60 hours Credits 4

Behavioural Competency

Statement of the Competency	**Achievement Context**
Provide technical support for a manufacturing project.	• In a workshop • Working as part of a team • Given drawings and specifications for a project in development • Using a computer • Using the necessary equipment and materials

Elements of the Competency	**Performance Criteria**
1. Prepare the work.	• Consideration of information gathered on innovations • Accurate verification of project data • Appropriate choice of materials based on the instructions • Availability of the necessary resources
2. Implement the required safety measures.	• Appropriate identification of potential risks and their impact on health and safety • Determination of relevant safety measures • Conscientious verification and installation of safety accessories on the machines
3. Make a prototype.	• Appropriate distribution of tasks • Appropriate preparation of equipment • Compliant patterns, templates, jigs and fixtures • Application of the appropriate techniques at each step in the manufacturing process • Meticulous monitoring of quality and compliance • Clear notes taken during manufacturing • Appropriate cleaning and tidying of work area
4. Validate various aspects of the manufacturing process.	• Thorough verification of the consistency between materials and equipment • Appropriate revision of the cutting list and plan • Accurate determination of actual manufacturing time • Appropriate adjustments to the manufacturing process

5. Propose adjustments to the project.	• Report in compliance with company requirements • Accurate information conveyed • Realistic proposals supported by the appropriate justifications • Appropriate correction of shop drawings *For the competency as a whole:* • Consideration of the company's resources • Consistent application of occupational health and safety rules • Precise measurements • Appropriate use of sketching techniques • Receptivity and openness to feedback • Perseverance

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each element of the competency, along with their attendant guidelines.

For the competency as a whole:

- Terminology related to prototyping
- Discussion of perceptions within the team, using sketches or drawings
- Compliance with rules regarding the economical use of materials and accurate measurements
- Application of knowledge covered previously concerning approaches aimed at improving productivity
- Specific attitude required for this competency: perseverance, in order to provide the technical support needed to validate new products

1. Prepare the work.

   - Application of knowledge covered in *Planning the Manufacturing of a Product* for the preparation of resources, and in *Developing Products*, for the verification of projects
   - Method for identifying errors

2. Implement the required safety measures.

   See appendix for the occupational health and safety risks listed in the job analysis report.
   - Risk sources
   - Effects on health and safety
   - Preventive measures

3. Make a prototype.

    - Method for working and distributing tasks in a team
    - Purpose of a prototype and manufacturing requirements
    - Application of techniques for parts preparation; assembly; pattern, template, jig and fixture preparation; veneering, laminating and preparation for staining
    - Company's quality standards
    - Importance of observation and feedback from the team
    - Notes taken concerning actual manufacturing times, operations, materials, equipment, etc.

4. Validate various aspects of the manufacturing process.

    - Aspects to verify:
        – consistency between materials and equipment
        – cutting list and plan
        – safety measures
        – method for recording estimated times with respect to actual times
        – correlation between estimates and actual times
    - Method for making adjustments to the project in line with the company's approach

5. Propose adjustments to the project.

    - Report: inconsistencies between estimates and actual times, manufacturing operations, resources, etc.; correction of drawings, if applicable; adjustments to project
    - Rules for writing reports: comprehensive information, clarity and conciseness, cleanliness of document
    - Method for conveying information depending on the situation
    - Openness to feedback and creativity in order to propose solutions

Entering the Workforce	Code: 773516

Competency 21 Duration 90 hours Credits 6

Situational Competency

Statement of the Competency

Enter the workforce.

Elements of the Competency

- Become familiar with the practice of the trade in a company.
- Integrate the knowledge, skills, attitudes and habits acquired during training.
- Become aware of any changes in how they view the trade that result from a practicum in the workplace.

Learning Context

Information Phase

- Learning about the terms and conditions of the practicum.
- Setting criteria for selecting companies.
- Finding companies likely to hire trainees.
- Taking steps to obtain a practicum position.

Participation Phase

- Observing the work context.
- Carrying out or participating in various work-related tasks.
- Keeping a log in which they record their observations about the work context and the tasks carried out in the workplace.

Synthesis Phase

- Identifying aspects of the trade that correspond to the training received, and those that do not.
- Discussing the impact of their experience during the practicum on their career choice: aptitudes and interests.

Instructional Guidelines

- Maintain close collaboration between the school and the company.
- Provide students with the documentation needed to prepare for the practicum and to keep a log.
- Make it possible for students to perform work-related tasks.
- Provide students with regular supervision during the practicum.
- Make sure that students are constantly supervised by a person in the company.
- Intervene in the case of difficulties or problems.

Participation Criteria

Information Phase

- List companies that meet their pre-determined selection criteria.
- Meet with a person in the company with a view to obtaining a practicum position.

Participation Phase

- Comply with company policies concerning the tasks they are allowed to perform as trainees, work schedules, occupational health and safety rules and professional ethics.
- Record information about the work context and the tasks performed in the company.

Synthesis Phase

- Write a practicum report.
- Share their experience in the workplace:
  - evaluate their participation in the workplace
  - specify the tasks and activities performed during the practicum
  - emphasize the connection between the training received and the current job market

Suggestions for Competency-Related Knowledge and Know-How

The following is a summary of the knowledge, skills, strategies, attitudes and perceptions related to each phase of the learning context, along with their attendant guidelines.

Information Phase

- Consultation of documentation concerning practicum positions
- Search for a practicum position, updating of résumé, preparation of a letter of introduction
- Types of companies in the field of cabinetmaking
- Production processes depending on the type of company and organization of work
- Work schedules
- Agreement on the terms and conditions of the practicum

Participation Phase

- Occupational health and safety (see appendix)
- Sense of responsibility and attitudes sought by employers
- Information about their experience in the workplace: schedule, difficulties encountered, activities performed, etc.

Synthesis Phase

- Contents of report: profile of the company, first impressions, observations, particular situations experienced and reactions
- Interests and aptitudes (see Competency 1)

APPENDIX

OCCUPATIONAL HEALTH AND SAFETY RISKS

Appendix: Occupational Health and Safety Risks

This appendix provides additional information about the risks mentioned in each competency of the *Cabinetmaking* program.

The tables on the following pages specify the knowledge, skills, strategies, attitudes, perceptions, etc. to be developed during the program. The aim is to ensure that future workers remain safe in learning situations and in the workplace throughout their career. The tables are based on work done in collaboration with the Commission des normes, de l'équité, de la santé et de la sécurité du travail (CNESST) at the job analysis stage.

The first table relates the six risk sources to each competency. It also specifies whether the risk level is high or low. Risk levels are presented for information purposes only, since they vary according to operation and achievement context. The first table is intended to help teachers plan gradually more difficult learning activities in compliance with occupational health and safety rules.

The second table provides a more detailed look at the six risk sources, indicating:

1) risks and dangers
2) effects on health
3) preventive measures

It also provides guidelines for developing learning content.

List of occupational health and safety risks and dangers:

- *Chemical risks and dangers:*
  - *Inhalation*
  - *Cutaneous absorption of toxic, corrosive or flammable chemicals*
  - *Ingestion*

- *Physical risks and dangers:*
  - *Noise*
  - *Bodily injury*

- *Biological risks and dangers:*
  - *Harmful agents in certain types of wood*

- *Ergonomic risks and dangers:*
  - *Effort exerted to lift materials*
  - *Inappropriate workstation*
  - *Repetitive movements*

- *Safety risks and dangers:*
  - *Workplaces*
  - *Use of electric machine tools*
  - *Use of pneumatic tools*
  - *Condition of indoor sites*

- *Psychosocial risks and dangers:*
  - *Overtime*
  - *Time constraints*

Table 1

RISK SOURCES AND LEVELS FOR EACH COMPETENCY								
CABINETMAKING ***STATEMENT OF THE COMPETENCY***	**Competency Number**	**Risk sources**						
		Chemical risks and dangers	Physical risks and dangers	Biological risks and dangers	Ergonomic risks and dangers	Safety risks and dangers	Psychosocial risks and dangers
		1	**2**	**3**	**4**	**5**	**6**
Determine their suitability for the trade and the training process	**1**		o			o	
Interpret drawings	**2**				o		o
Take measurements and do calculations required for manufacturing	**3**		o		o	o	o
Make an object using hand tools	**4**	•	•	•	•	•	•
Prepare the parts for a piece of furniture to be manufactured	**5**	•	•	•	•	•	•
Assemble furniture	**6**	•	•	•	•	•	•
Make patterns, templates, jigs and fixtures	**7**	•	•	o	•	•	•
Analyze the impact of finishing processes on manufacturing	**8**	•	•	•	•	•	•
Make technical drawings	**9**				o	o	o
Make a straight piece of furniture out of solid wood	**10**	•	•	•	•	•	•
Veneer and laminate materials	**11**	•	•	•	•	•	•
Make panel furniture	**12**	•	•	•	•	•	•
Plan the manufacturing of a product	**13**	o	o		o	o	o
Manufacture commercial, industrial or institutional furniture	**14**	•	•	•	•	•	•
Manufacture and install modular kitchen components	**15**	•	•	•	•	•	•
Explore traditional and innovative techniques	**16**	•	•	•	•	•	•
Make curved furniture	**17**	•	•	•	•	•	•
Manufacture and install architectural products	**18**	•	•	•	•	•	•
Help develop a product	**19**				o		o
Provide technical support for a manufacturing project	**20**	•	•	o	o	•	•
Enter the workforce	**21**	•	•	•	•	•	•

<u>Risk levels</u>: Risk levels are based on the frequency, duration and intensity of the presence of risk sources and not on the seriousness of the impact on health and safety.

Low risk: o High risk: •

Table 2 Occupational Health and Safety Issues Related to Cabinetmaking[3]

No.	Risk sources	Effects on health and safety	Preventive measures
1.	**Chemical risks and dangers**		
	1.1 Inhalation		
	• Wood dust	Lungs Particles ≤ 30 µm penetrating the airways Respiratory problems: • Irritation of the lungs • Pulmonary fibrosis, conjunctivitis, alveolitis • Allergies (eczema, rhinitis, asthma) • Ethmoid cancer Other: • Irritation of the eyes, nasal dryness and obstruction	• Ensure acceptable dust levels in the ambient air • Install a dust recovery system near the source (enclosed or open dust extractor or collector in compliance with the *Regulation respecting occupational health and safety*) • Wear a mask and safety glasses • Place shop air intakes far from sources of pollution (carbon dioxide) • Prohibit using blowers to clean up
	• Toxic, corrosive, flammable products (even odourless products): paints, glues, solvents, varnishes, strippers, thinners, lacquers, stains	• Irritation • Sore throat • Headache • Dizziness	• Install a compliant extraction system at the source for controlled products • Verify storage, handling and use of flammable liquids in compliance with National Fire Protection Association standard NFPA30 • Use individual protective equipment
	1.2 Subcutaneous absorption of toxic, corrosive, flammable products (even odourless products): paints, glues, solvents, varnishes, strippers, thinners, lacquers, stains	Skin and eyes: • Skin contact • Burns • Splashes • Dermatitis Danger: • Intoxication	• Wear appropriate gloves and organic cartridge respirator • Wear safety glasses • Use tools to submerge materials in liquid • Install a compliant extraction system at the source for solvents emitted into the ambient air

[3] Taken from the job analysis.

No.	Risk sources	Effects on health and safety	Preventive measures
			• Verify storage, handling and use of flammable liquids in compliance with standard NFPA30 • Place rags soaked in solvent in a sealed metal recipient containing water
	1.3 Ingestion • Toxic, corrosive, flammable products (even odourless products): paints, glues, solvents, varnishes, strippers, thinners, lacquers, stains	• Stomach and digestive tract • Hand-to-mouth contact	• Wash hands after handling substances • Clean work surfaces
2.	**Physical risks and dangers** 2.1 Noise • Prolonged exposure to continuous noise • Loud noise over an extended work period • Continuous noise and excessive impact noise • Use of earphones in an environment characterized by loud ambient noise	Auditory system • Irritability • Effect on mood • Auditory fatigue • Hearing loss in the long term • Anxiety • Aggressiveness • Depression • Tinnitus • Cardiovascular risks • Digestive problems • Sleep disorders • Attention disorders (impaired alertness)	• Comply with the sections of the *Regulation respecting occupational health and safety* having to do with noise • Wear ear plugs or other ear protection • Reduce noise at the source
	2.2 Bodily injury • Possible contact with materials or machines • Need to preserve bodily integrity • Handling of raw materials • Improperly stacked materials	Multiple bodily injuries: • Pressure (feet) • Long hair (static electricity) • Eyes (slivers and glare) • Lungs (dust) • Hands (heat)	• Wear appropriate clothing – Safety shoes – Hairnet – Safety glasses – Appropriate respiratory system – Appropriate gloves • Inspect tools and equipment • Stack materials on shelves and forklifts in an organized manner

No.	Risk sources	Effects on health and safety	Preventive measures
3.	**Biological risks and dangers** 3.1 Harmful agents in certain types of wood: • Alkaloids • Tannins • Terpenes • Etc.	• Skin irritations • Mucous membrane irritations • Allergic reactions	• Consult data sheets for wood and wood products • Use individual protective equipment
4.	**Ergonomic risks and dangers** 4.1 Effort exerted to lift materials • Falling objects • Lifting and transportation of heavy objects • Risk of tripping while carrying heavy objects	• Contusions • Cuts • Being crushed • Amputations • Fractures • Tendinitis • Bursitis • Sprains • Back pain	• Systematically use assisted handling and methods for levelling and grasping loads • Use a forklift or other equipment to help lift and transport heavy machinery • Provide training in risk prevention when handling loads • Ensure an uncluttered, well-lit environment

No.	Risk sources	Effects on health and safety	Preventive measures
	4.2 Inappropriate workstation: • Non-adjustable work tables or benches • Improperly positioned computer and screen	• Musculoskeletal disorders of the arms and back, and back pain	• Ensure an appropriate layout for the job (work table and bench at an appropriate height for the worker) • Store tools and equipment appropriately
	4.3 Repetitive movements • Repetitive use of certain portable tools • Repetitive movements of the arms and torso when using certain tools	• Fatigue • Musculoskeletal disorders of the arms • Back pain (especially lumbar pain) • Muscle soreness • Pulled muscles • Carpal tunnel syndrome	• Attenuate vibrations by wearing gloves • Adopt comfortable postures • Vary work postures • Use a small footstool on occasion, vary posture and rest the lumbar region when standing for long periods of time, use a work table with a foot rail • Ensure an appropriate workstation layout (location of tools, accessible materials, no constraints) • Use effective tools to limit excessive effort
5.	**Safety risks and dangers** 5.1 Workplaces • Floors	• Contusions • Cuts • Being crushed • Amputations • Fractures • Excessive effort	• Make sure floors are clean and in good repair • Avoid clutter • Remove sawdust and other debris • Ensure that there are no obstacles • Install anti-skid floor coverings near stationary machine tools; use anti-fatigue matting
	• Travel paths	• Collisions • Accidents • Falls	• Paint lines on the floor • Make sure floors are uncluttered, anti-skid and in good repair • Make sure floors are sufficiently wide to allow for safe handling • Call out to colleagues when moving materials

No.	Risk sources	Effects on health and safety	Preventive measures
	• Workstation	• Incidents • Cuts • Strains • Sprains • Contusions	• Store tools appropriately • Make sure the workstation is clean and uncluttered • Make sure the workstation is well lit • Install anti-skid flooring • Wear appropriate safety shoes • Make sure there is sufficient space between machines, installations and materials
	• Fire	• Circulatory system • Respiratory system • Cardiac system • Sweating to death	• Make sure there are a sufficient number of smoke detectors and fire alarms • Make sure there are a sufficient number of accessible and regularly verified fire extinguishers • Make sure there are easily accessible and well-indicated emergency exits lit by emergency lighting • Ensure proper ventilation • Make sure there is an appropriate waste management system • Make sure there is an evacuation plan • Place ignition sources at a distance • Use personal protective equipment
5.2	Use of electric machine tools • Injuries caused by foreign objects in the face and skin abrasions	• Contusions • Deep cuts and lacerations • Particle projection • Being crushed • Amputations • Fractures • Internal or external burns	• Use personal protective equipment (e.g. visor, glasses, respiratory protective equipment) • Before doing any maintenance, repairs, unblocking or adjustments in the danger zone, always shut off and lock the machine’s energy sources • Wear well-adjusted clothing with no loose or dangling parts • Adopt a good, well-balanced work posture

No.	Risk sources	Effects on health and safety	Preventive measures
			• Make sure there is sufficient lighting • Use push sticks, jigs or fixtures or mounting equipment to keep hands away from the danger zone and retaining devices • Place power cords so that they are not in the way; when they are on the floor, protect them against damage • Supervise portable tool or equipment from the time it is started up to the time it stops completely • Make sure electrical appliances and machinery are compliant (protection of moving parts) • Before starting work, allow the machine to achieve its maximum speed
5.3	Use of pneumatic tools	• Particle projection • Fatigue, stress, impaired alertness • Vascular disorders, discomfort (numbness)	• Verify the tool's direction of rotation • Properly connect the air hose to the tool's collector and the compressor's collector • Adjust tool speed • Shutdown: cut the air supply, bleed the hose and disconnect
			• Never carry a pneumatic tool by the air hose • Never point the nozzle at yourself or someone else • Make sure that the tool's safety devices are present and in good repair • When cleaning and adjusting a tool, disconnect it from the compressed air supply
5.4	Condition of indoor sites • Floors • Electrical installations • Heating	• Contusions • Cuts • Being crushed • Amputations	• Install anti-skid and easily maintained floor coverings • Wear appropriate shoes

No.	Risk sources	Effects on health and safety	Preventive measures
	• Lighting • Ventilation • Sanitary facilities	• Fractures • Electric shocks (not fatal) • Electrocution (fatal) • Heat stroke	• Make sure that the electrical installations and heating system are compliant • Provide training on electrical risks and dangers • Make sure that there are no naked flames or temperatures higher than the self-ignition temperature of a flammable product • Ensure appropriate lighting for the task in question • Make sure that the ventilation system is in good repair and well-maintained, and that it prevents excessive air currents • Store merchandise appropriately • Clear passageways and exits • Observe the rules of hygiene • Evaluate heat constraints
6.	**Psychosocial risks and dangers** 6.1 Overtime High season: • Frequent long overtime hours	• Chronic fatigue • Sleep disorders • Poor nutrition • Family, relational and social problems • Impaired judgment • Burnout	• Limit daily overtime hours and make sure to take weekly days off
	6.2 Time constraints • Requirements of production deadlines • Increased risk of accident caused by failure to take safety measures, especially when using equipment • Lack of resources	• Stress • Injuries caused by accident • Burns	• Manage production, time, and human and material resources • Perform preventive maintenance on equipment • Follow safety rules and practices at all times

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Éducation et Enseignement supérieur

Québec