

21.2.0 JOINERY WORKS

21.2.1 Introduction

The module unit is intended to equip the trainee with knowledge, skills and attitudes that are necessary to design, select materials for and produce fixed joinery works.

21.2.2 General Objectives

By the end of the module unit, the trainee should be able to:

- a) Select suitable material for use in joinery works
- b) Design and construct joinery components using appropriate jointing systems
- c) Utilize emerging technologies in design and fabrication of joinery works
- d) Apply cost effective methods in producing joinery products

21.2.3 Module Unit Summary and Time Allocation

Joinery Works

Code	Sub-Module Unit	Content	Time (Hours)		
			Theory	Practice	Total
21.2.01	Materials for Joinery Works	<ul style="list-style-type: none">• Fastening materials• Classification of hardware materials• Properties of contemporary materials• Fabricating items using contemporary materials• Causes of deterioration of materials• Techniques of prevention of materials deterioration	2	8	10
21.2.02	Furniture	<ul style="list-style-type: none">• Design process of furniture• Design Elements for	6	10	16

Code	Sub-Module Unit	Content	Time (Hours)		
			Theory	Practice	Total
		Furniture <ul style="list-style-type: none"> • Timber Stairs 			
21.2.03	Joints and Materials preparation	<ul style="list-style-type: none"> • Types of joints • Material preparation • Joint design and fabrication 	4	10	14
21.2.04	Partitioning	<ul style="list-style-type: none"> • Types of partition walls • Sketching types of Partition walls • Materials used in Construction of partitions • Functional requirements 	4	12	16
21.2.05	Doors and Windows	<ul style="list-style-type: none"> • Door Frames and Linings • Door Types • Door Fittings • Types of Windows 	6	14	20
21.2.06	Finishes	<ul style="list-style-type: none"> • Types of finishes • Surface preparation and treatment • Application of finishes 	2	4	6
21.2.07	Basic Costing of Fixed Furniture Products	<ul style="list-style-type: none"> • Quantification • Cutting list • Schedule of materials 	5	12	17
Total			29	70	99

21.2.01 MATERIALS FOR JOINERY WORKS

21.2.01C Competence

The trainee should have the ability to:

- i) Select and use correct materials for fastening
- ii) Produce furniture using various assembly provision

Theory

- 21.2.01T0 *Specific Objectives*
By the end of the sub-module unit, the trainee should be able to:
- a) identify different types of fastening materials
 - b) classify different types of hardware materials
 - c) outline the properties of different materials
 - d) describe different procedures for using contemporary materials
 - e) identify causes of deterioration of joinery materials
 - f) explain procedures of prevention of deterioration of joinery materials

Content

- 21.2.01T1 Fastening materials
 - i) fasteners
 - ii) adhesives
- 21.2.01T2 Classification of hardware materials
- 21.2.01T3 Properties of contemporary materials
 - i) bamboo
 - ii) cane
 - iii) reeds
 - iv) flexible materials
 - v) emerging materials
- 21.2.01T4 Making furniture items using contemporary materials
- 21.2.01T5 Causes of deterioration of materials
- 21.2.01T6 Methods of prevention of materials deterioration

Practice

- 21.2.01P0 *Specific Objectives*
By the end of the sub-module unit, the trainee should be able to:
- a) select and use the correct materials for fastening
 - b) apply the correct techniques of assembling joints

Content

- 21.2.01P1 Types of materials used in fastening
- 21.2.01P2 Assembling techniques

Suggested Teaching/Learning Resources

- Sketches
- Realia

Suggested Teaching/Learning Activities

- Discussions
- Site visits

Suggested Assessment Methods

- Finished students projects
- Practical tests

21.2.02 FURNITURE

21.2.02C Competence

The trainee should have the ability to:

- Come up with simple designs of fixed furniture
- Produce different types of fixed furniture
- Construct a given stair case

Theory

- 21.2.02T0 *Specific Objectives*
By the end of the sub-module unit, the trainee should be able to:
- explain the design process for simple fixed furniture

- design models and prototypes of different types of fixed furniture
- explain the procedure for setting out wooden staircase

Content

- 21.2.02T1 Basic design process
- problem identification
 - problem definition
 - refinement
 - design analysis
 - decision making
 - design implementation
- 21.2.02T2 Design models, elements for cabinets, wardrobes, interior trims and wall panels
- 21.2.02T3 Wooden staircase
- stair design
 - stair layout
 - stair detailing
 - hand rails

Practice

- 21.2.02P0 *Specific Objectives*
By the end of the sub-module unit, the trainee should be able to:
- designs different types of fixed furniture
 - make models and prototypes of different types of fixed furniture

- Content*
- 21.2.02P1 Designs of fixed furniture
- i) functionability
- ii) aesthetics
- 21.2.02P2 Models and prototypes

Suggested Teaching/Learning Resources

- Charts
- Models
- Joint details
- Illustrations
- Prototypes

Suggested Teaching/Learning Activities

- Discussion
- Class exercises
- Assignments
- Sketching
- Workshop practice

Suggested Assessment Methods

- Students class projects
- Practical assignments

21.2.03 JOINTS AND MATERIALS PREPARATION

- 21.2.03C Competence**
- The trainee should have the ability to make different types of wood joints for furniture products

Theory

- 21.2.03T0 *Specific Objectives*
- By the end of the sub-module unit, the trainee should be able to:
- a) describe classes of joints used in joinery
 - b) describe joint design procedures
 - c) prepare material ready for jointing

Content

- 21.2.03T1 Classification of joints
- i) carcasing
 - ii) framing
 - iii) lengthening
- 21.2.03T2 Joint design
- i) proportion
 - ii) strength
 - iii) fastening method
 - iv) aesthetics
- 21.2.03T3 Material preparation
- i) procedure
 - ii) alternative jointing methods for contemporary materials

Practice

- 21.2.03P0 *Specific Objectives*
- By the end of the sub-module unit, the trainee should be able to:
- a) make suitable joints in fabrication of products
 - b) prepare materials ready for fabrication

- 21.2.03P1 *Content* Joints
 21.2.03P2 Material preparation

Suggested Teaching/Learning Resources

- Joints illustration
- Text books
- Manuals
- Realia
- Wood workshop

Suggested Teaching/Learning Activities

- Discussions
- Workshop exercises
- Assignments

Suggested Assessment Methods

- Student's projects
- Practical tests

21.2.04 PARTITIONING

21.2.04C Competence

The trainee should have the ability to construct different types of partitioning walls

Theory

21.2.04T0 *Specific Objectives*

By the end of the sub-module unit, the trainee should be able to:

- a) Describe given types of partition walls
- b) sketch given types of partition walls

- c) state the materials used in construction of partitions
- d) explain the functional requirements of partitions

Content

21.2.04T1 Types of partition walls

- i) timber partitions
- ii) aluminium partitions
- iii) light gauge steel partitions
- iv) partition panel boards

21.2.04T2 Sketches

- i) glazed partition
- ii) framed partitions
- iii) assembly methods

21.2.04T3 Materials used in construction of partitions

- i) timber
- ii) steel
- iii) manufactured boards
- iv) glass
- v) plastic

21.2.04T4 Requirements of partitions

- i) thermal insulation
- ii) sound insulation
- iii) aesthetics

Practice

21.2.04P0 *Specific Objectives*

By the end of the sub-module unit, the trainee should be able to:

- a) construct different types of wooden partition walls
- b) construct partitions using various materials
- c) detail methods of framework partitions

Content

- 21.2.04P1 Wooden partition walls
- 21.2.04P2 Other materials used for partitioning
- 21.2.04P3 Details of framework partitioning
 - i) timber
 - ii) aluminium
 - iii) light gauge steel

Suggested Teaching/Learning Resources

- Charts
- Models

Suggested Teaching/Learning Activities

- Class exercises
- Discussions
- Assignments
- Site visits
- Drawing

Suggested Assessment Methods

- Class projects
- Illustration assignments

21.2.05 DOORS AND WINDOWS

21.2.05C Competence

The trainee should have the ability to prepare illustrations of different types of doors and windows

Theory

21.2.05T0 *Specific Objectives*

By the end of the sub-module unit, the trainee should be able to:

- a) explain different types of door frames and linings
- b) outline different types of doors
- c) describe different types of door fittings
- d) sketch different types of windows

Content

21.2.05T1 Door frames and linings

- i) door linings
- ii) lining that incorporate architraves
- iii) framed linings
- iv) door frames with fan light
- v) metal frames
- vi) door furniture

21.2.05T2 Door types

- i) ledged and braced
- ii) framed ledged and braced
- iii) paneled doors
- iv) flush doors
- v) glazed doors

- vi) composite doors
 - vii) Special doors
- 21.2.05T3 Door fittings
- i) hinges
 - ii) locks
 - iii) handles
 - iv) bolts
 - v) plates
 - vi) kicker

- 21.2.05T4 Types of windows
- i) fixed and opening windows layout
 - ii) casement
 - iii) louvered
 - iv) bay windows
 - v) sliding
 - vi) composite windows
 - vii) glazed windows

Practice

- 21.2.05P0 *Specific Objectives*
By the end of the sub-module unit, the trainee should be able to:
- a) make different types of door and window frames
 - b) identify and use appropriate window/door furniture

Content

- 21.2.05P1 Door frames and linings
- 21.2.05P2 Door and window furniture

Suggested Teaching/Learning Resources

- Working drawings

- Models
- Realia

Suggested Teaching/Learning Activities

- Discussions
- Site visits
- Assignments

Suggested Assessment Methods

- Projects
- Workshop exercises

21.2.06 FINISHES

21.2.06C Competence

The trainee should have the ability to identify and apply different types of finishes

Theory

- 21.2.06T0 *Specific Objectives*
By the end of the sub-module unit, the trainee should be able to:
- a) identify types of finishes used for furniture
 - b) outline procedure of surface preparation
 - c) outline methods of applying finishes to surfaces

Content

- 21.2.06T1 Types of finishes
- i) varnish
 - ii) paint

- iii) polish
- iv) stain
- 21.2.06T2 Surface preparation and treatment
 - i) sanding, scraping
 - ii) bleaching
 - iii) grain filling
 - iv) staining
- 21.2.06T3 Methods of applying finishes to surfaces
 - i) brushing
 - ii) spraying
 - iii) rolling

Practice

- 21.2.06P0 *Specific Objectives*
By the end of the sub-module unit, the trainee should be able to:
 - a) prepare various finishing materials
 - b) apply finishes to completed items of furniture
 - c) clean application tools

Content

- 21.2.06P1 Preparing finishing materials
- 21.2.06P2 Finish application
- 21.2.06P3 Cleaning of application tools

Suggested Teaching/Learning Activities

- Demonstrations
- Discussions
- Workshop exercises

Suggested Teaching/Learning Resources

- Manufacturer's notes
- Resource persons
- Realia

Suggested Assessment Methods

- Projects
- Observation
- Assignments

21.2.07 BASIC COSTING OF FIXED FURNITURE PRODUCTS

21.2.07C Competence

The trainee should have the ability to:

- i) Estimate the cost of finished product
- ii) Estimate the cost of the working materials for fixed furniture

Theory

- 21.2.07T0 *Specific Objectives*
By the end of the sub-module unit, the trainee should be able to:
 - a) outline the procedure of estimating and costing finished products
 - b) outline the procedure of estimating the cost

- of materials and labour
- c) prepare a cutting list for materials

Content

- 21.2.07T1 Quantification
 - i) detail drawing
 - ii) setting out rod
 - iii) template
- 21.2.07T2 Cutting list
 - i) item description
 - ii) sizes
 - iii) materials
- 21.2.12T3 Bill of materials
 - i) unit rate
 - ii) cost rate
 - iii) cost per material
 - iv) total cost

Practice

- 21.2.07P0 *Specific Objective*
By the end of the sub-module unit, the trainee should be able to:
 - a) cost the project materials

- b) cost the finished product

Content

- 21.2.07P1 Costing the project materials
- 21.2.07P2 Costing the finished product
 - i) materials
 - ii) production cost
 - iii) overheads and profit

Suggested

Teaching/Learning Resources

- Price lists from suppliers

Suggested

Teaching/Learning Activities

- Discussions
- Class assignments
- Calculations

Suggested Assessment

Methods

- Tests
- Exercises
- Assignments