Republic of Rwanda
Ministry of Education

RTB | RWANDA TVET BOARD

BASIC WOOD PROPERTIES

WOTWP301

DEMONSTRATE KNOWLEDGE OF BASIC WOOD PROPERTIES

Competence

RQF Level: 3

Learning Hours: 30

Credits: 3

Sector: Agriculture and Food Processing

Trade: Wood Technology

Module Type: General

Curriculum: AFPWOT3002- TVET Certificate 3 in Wood Technology

Issue Date: June 2022

<table>
<tr><td rowspan="7">Purpose statement</td><td colspan="6">This module describes skills, knowledge and right attitudes to acquire fundamental understanding of tree growth and the process of wood formation, the development of woody cells, basic properties of wood and how it influences the end use of the timber. It is designed for students pursuing TVET certificate III in wood technology. Graduates at this level will have knowledge and skills for initial work, community involvement and/or further learning.</td></tr>
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Delivery modality	**Training delivery**		**100%**	**Assessment**		**Total 100%**
	Theoretical content		30%	Formative assessment	30%	50%
	Practical work:		70%		70%	
	• Group project and presentation	20%				
	• Individual project /Work	50%				
				Summative Assessment		50%

Elements of Competency and Performance Criteria

Elements of competency	Performance criteria
1. Describe basic properties of wood	1.1. Wood formation is correctly described in line with woody plants classes
	1.2. Properties of wood are sufficiently described based on their types
	1.3. Macroscopic and microscopic structures of wood are correctly described according to the wood category
2. Classify wood properties	2.1. Wood properties are correctly classified into mechanical and physical properties
	2.2. Differences in the classes of wood properties are correctly defined with examples
	2.3. Factors that determine classification of wood properties are correctly described with examples
3. Describe effects of wood properties to timber use	3.1. Effects of wood properties to timber application are correctly established
	3.2. Effects of wood properties to timber drying are correctly determined
	3.3. Effects of wood properties to strength of timber are correctly determined
	3.4. Effects of wood properties on surface treatment are clearly stated

Course content

Learning outcomes	At the end of the module the learner will be able to: 1. Describe basic properties of wood 2. Classify wood properties 3. Describe effects of wood properties to timber use
Learning outcome 1: Describe basic properties of wood	**Learning hours: 10**

Indicative content

- **Description of wood formation**
  - ✓ Description of process of photosynthesis
  - ✓ Explanation of Initiation of tree growth
    - Height growth
    - Diameter expansion
  - ✓ Formation of wood cells
- **Description of types of woody plants**
  - ✓ Tree
  - ✓ Shrub
  - ✓ Woody lianas
- **Description of wood properties**
  - ✓ Explanation of wood physical properties
    - Wood moisture content
    - Wood density
    - Shrinkage and swelling
    - Decay resistance
  - ✓ Description of mechanical properties of wood
    - Strength
    - Weight /density
- Macroscopic and microscopic structures of wood
  - ✓ Description of macroscopic structure
    - Sapwood and heart wood
    - Growth rings

- Grains
- Texture
- Colour
- Figure
- Odour

✓ Microscopic structure

- Description of softwood structure
- Tracheids
- Description of hardwood structure
  - Vessels

Resources required for the learning outcome	
Equipment	• Hand lens • PPE • Computer • Internet • Projector
Materials	• wood samples • marker pens • white board
Tools	• Scalpel
Facilitation techniques	• Group discussion • Trainer guided • Lectures • Demonstration and simulation • Individual and group work • Practical exercise on identification of woody plants • Group discussion
Formative assessment methods	• Written assessment • Oral assessment • Performance assessment

Learning outcome 2: Classify wood properties	**Learning hours: 10**

Indicative content

- Classification of wood properties into mechanical and physical properties
  - ✓ Mechanical properties
    - Definition of mechanical properties
    - Identification of mechanical properties
  - ✓ Physical properties
    - Definition of physical properties
    - Identification of physical properties
  - ✓ Chemical properties
    - Definition of chemical properties of wood
    - Identification of chemical properties
- Differences in classes of wood properties
  - ✓ Physical properties
  - ✓ Mechanical properties
  - ✓ Chemical properties
- Factors that affect wood properties
  - ✓ Explanation of factors affecting strength of wood
- Anatomical factors
  - ✓ Density
  - ✓ Slope of grain
  - ✓ Knots
  - ✓ Moisture content
- Environmental factors
  - ✓ Decay resistance
  - ✓ Temperature

Resources required for the indicative content

Equipment	• PPE • Computer,

	• Internet, • Projector
Materials	• Charts and diagrams • Flipchart • Markers • Different types of wood pieces
Tools	•
Facilitation techniques	• Lectures • Demonstration and simulation • Practice • Individual and group work • Individualized • Trainer guided • Group discussion
Formative assessment methods	• Written assessment • Oral presentation • Performance assessment

Learning outcome 3: Describe effects of wood properties to timber use	**Learning hours: 10**
Indicative content	

- **Effects of wood properties on timber application**
  - ✓ Description of physical and mechanical properties in relations to timber use
    - Effects of density
    - Moisture content
    - Colour
    - Odour
    - Hardness
- **Effects of wood properties on timber drying**
  - ✓ Identification of wood properties affecting timber drying
  - ✓ Description of wood physical properties affecting timber drying
- **Effects of wood properties to strength of timber**
  - ✓ Description of effects of density on strength of timber
  - ✓ Description of effects of slope of grain on strength of timber
  - ✓ Description of effects of knots on strength of wood
  - ✓ Description of how decay affects strength of timber
- **Effects of wood properties on surface treatment**
  - ✓ Description of properties of wood affecting surface treatment
    - Wood density
    - Swelling and shrinkage
    - Wood porosity
    - Extractive content
    - Moisture content

Resources required for the indicative content	
Equipment	• Computer, • Projector
Materials	• Different wood samples
Tools	•
Facilitation techniques	• Lectures • Demonstration and simulation • Individual and group work

	• Individualized • Trainer guided • Group discussion
Formative assessment methods	• Written assessment • Oral presentation