

FORTS402

TREE SPECIES

Describe tree species

Competence

RQF Level: 4

Learning Hours



100

Credits: 10

Sector: Agriculture and Food processing

Trade: Forestry

Module Type: Specific

Curriculum: AFPFOR4002 - TVET Certificate 4 in Forestry

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1200

Purpose statement	This module describes the skills, knowledge and attitude required to describe tree species. It is designed for learners who have successfully completed level III Forestry and pursuing level VI in Forestry. At the end of this module, learner will be able to identify forestry species, identify agroforestry species and identify the categories of trees. Qualified learner deemed competent may work in various places including open field and a range of tasks related to tree species. She/he can work alone or with others under minimum supervision. F A O. 2004. National forest inventory field manual template			
Delivery modality	Training delivery	100%	Assessment	Total 100%
	Theoretical content	30%		
	Practical work:	70%	Formative assessment	50%
	Group project and presentation			
	Individual project /Work			
			Summative Assessment	50%

Elements of Competency and Performance Criteria

Elements of competency	Performance criteria
1. Identify forest species	1.1. Forest species are correctly classified according to their origin
	1.2. Forest species are correctly classified basing on their botanical classification
	1.3. Forest species are correctly classified according to their morphological characteristics
	1.4. Forest species are properly localised according to their ecological factors
2. Identify agro forestry species	2.1. Agroforestry species are correctly classified according to their origin
	2.2. Agroforestry species are correctly classified basing on their botanical classification
	2.3. Agroforestry species are correctly classified according to their morphological characteristics
	2.4. Agroforestry species are properly localised according to their ecological factors

	2.5. Agroforestry species are properly classified according to their usage
3. Identify the categories of trees	3.1. Trees are properly classified according to their phylogeny
	3.2. Trees are properly grouped basing on their vascular system
	3.3. Trees are correctly classified according to their structures and properties

Knowledge, Skills, and Attitude

Knowledge	Skills	Attitude
✓ Identify forest structure ✓ Identify forest composition ✓ Identify forest ownership ✓ Identify origin of forest	✓ Handle tools and equipment ✓ Classify forest species ✓ Classify agroforestry species	✓ Work in team while collecting forest species ✓ Respect safety, health and environment on the workplace ✓ Work under pressure during collection and classification of forest and agroforestry trees ✓ Manage the time ✓ Work under minimum supervision

Course content

Learning outcomes	At the end of the module the learner will be able to: 1. Identify forest species 2. Identify agroforestry species 3. Identify the categories of trees
Learning outcome 1: Identify forest species	Learning hours: 35
Indicative content	
• Classification of forest species according to their origin ✓ Natural ✓ Artificial • Botanical classification of forest species ✓ Spermatophyta ✚ Gymnospermae ✚ Angiospermae ✓ Pteridophyta	

- ✚ Types of pteridophyta
- ✚ Classes of pteridophyta

- Morphological classification of forest species
 - ✓ Sizes
 - ✓ Shapes
 - ✓ leaf group
 - ✓ stem
 - ✓ roots
 - ✓ Inflorescence
 - ✓ Crown
- Ecological classification of forest species
 - ✓ Soil type
 - ✓ Climate
 - ✓ Vegetation
 - ✓ Altitude

Resources required for the learning outcome

Equipment	Binocular, camera, vehicles, laptop, telephone, GPS, Compass, Bitterlich relascope, audio visual equipment, first aid kit, PPE
Materials	Paints, warning tapes, pencils
Tools	Maps, notebook, markers, measuring tapes, callipers, pruning saws, machete, axes, cables, Haga altimeter, slasher, carpenter level, N-frame level, A-frame level, Plumb bob, Diameter tapes
Facilitation techniques	Demonstration and simulation, Individual and group work, Practical exercise, Individualized, trainer guided and Group discussion, viewing films and videos, pictures
Formative assessment methods	Written assessment, Oral presentation, and Performance assessment

Learning outcome 2: Identify agroforestry species**Learning hours: 30****Indicative content**

- Classification of agroforestry species according to their origin
 - ✓ Natural
 - ✓ Artificial
- Classification of botanical of agroforestry species
 - ✓ Spermatophyta
 - ✚ Gymnospermae
 - ✚ Angiospermae
 - ✓ Pteridophyta
 - ✚ Types of pteridophyta
 - ✚ Classes of pteridophyta
- Classification of morphology of agroforestry species
 - ✓ Sizes
 - ✓ Shapes
 - ✓ leaf group
 - ✓ stem
 - ✓ roots
 - ✓ Inflorescence
 - ✓ Crown
- Ecological classification of agroforestry species
 - ✓ Soil type
 - ✓ Climate
 - ✓ Vegetation
 - ✓ Altitude
- Classification of agroforestry species according to their usage
 - ✓ Production
 - ✓ Service
 - ✓ Protection

Resources required for the indicative content

Equipment	Binocular, camera, vehicles, laptop, telephone, GPS, Compass, Bitterlich relascope, audio visual equipment, first aid kit, PPE
Materials	Paints, warning tapes, pencils
Tools	Maps, notebook, markers, measuring tapes, callipers, pruning saws, machete, axes, cables, Haga altimeter, slasher, carpenter level, N-frame level, A-frame level, Plumb bob, Diameter tapes
Facilitation techniques	Demonstration and simulation, Individual and group work, Practical exercise, Individualized, trainer guided and Group discussion, viewing films and videos, pictures
Formative assessment methods	Written assessment, Oral presentation, and Performance assessment

Learning outcome 3: Identify the categories of trees**Learning hours: 35****Indicative content**

- Classification of trees according to the phylogeny
 - ✓ Kingdom
 - ✓ Division
 - ✓ Subdivision
 - ✓ Order
 - ✓ Class
 - ✓ Family
 - ✓ Genus
 - ✓ Species
- Classification of trees according to vascular systems
 - ✓ Vascular (tracheophyta)
 - ✚ Pteridophytes
 - ✚ Gymnosperm
 - ✚ Angiosperm
 - ✓ Non-vascular (bryophyta)
 - ✚ Bryophyta
 - ✚ Thallophyta
- Classification of trees according to structures and properties
 - ✓ Structures of trees
 - ✓ Properties of trees

Resources required for the indicative content**Equipment**

Chain saws, Binocular, camera, vehicles, laptop, telephone, GPS, Compass, Bitterlich telescope, Electronic balance, electronical furnace, audio visual equipment, first aid kit, PPE, wood laboratory kit

Materials

Paints, warning tapes, pencils, containers, wood samples

Tools	Maps, notebook, markers, measuring tapes, callipers, pruning saws, machete, axes, cables, Haga altimeter, slasher, Diameter tapes, knives, moisture meter, calculator
Facilitation techniques	Demonstration and simulation, Individual and group work, Practical exercise, Individualized, trainer guided and Group discussion, viewing films and videos pictures
Formative assessment methods	Written assessment, Oral presentation, and Performance assessment

Integrated/Summative assessment

Integrated situation

Gishwati-Mukura rainforest is located in Rutsiro district, Western Province. It is composed with different tree species. Some species are under extinction due to illegal mining and cutting trees for firewood. Rwanda Environment Management Authority plans to conduct a forestry survey on description of forest and agroforestry species in order to rehabilitate 20 ha of damaged part. The survey results will help to identify endangered tree species and guide rehabilitation strategies of the forest.

As a skilled Silviculturist, you are hired to conduct the following tasks:

1. Collect thirty (30) different forest tree species on one (1) ha in three (3) hours.
2. Collect thirty (30) different agroforestry tree species on one (1) ha in three (3) hours.
3. Classify forestry and agroforestry trees species basing their taxonomy in two (2) hours

Instructions:

1. Tools, materials and equipment are available in the store
2. Time allowed to accomplish these tasks is eight (8) hours

Resources

Equipment	Binoculars, camera, GPS, Compass, optical microscope, computer, PPE, magnifying lens.
Materials	Paints, warning tapes, pencils, containers, pins, markers
Tools	Maps, notebook, markers, measuring tapes, callipers, pruning saws, machete, axes, cables, Haga altimeter, slasher, Diameter tapes, knives, moisture meter, secateurs, pruning saw, containers

Assessable outcomes	Assessment criteria (Based on performance criteria)	Indicator	Observation		Marks allocation
			Yes	No	
1. Identify forest species (30%)	1.1. Forest species are correctly classified according to their origin	Indigenous tree species are identified			2
		Exotic tree species are			2

		identified			
	1.2. Forest species are correctly classified basing on their botanical classification	Spermatophyta are identified			2
		Pteridophyta are identified			2
	1.3. Forest species are correctly classified according to their morphological characteristics	Forest species are classified by their size			2
		Forest species are classified by their shape			2
		Forest species are classified by their leaf group			2
		Forest species are classified by their stem			2
		Forest species are classified by their roots			2
		Forest species are classified by their inflorescence			3
		Forest species are classified by their crown			3
	1.4. Forest species are properly localised according to their ecological factors	Forest species are localized by soil type			2
		Forest species are localized by climate			2
		Forest species are localized by topography			2
2. Identify agro forestry species (40%)	1.1. Agroforestry species are correctly classified according to their origin	Indigenous tree species are identified			2
		Exotic tree species are identified			2
	1.2. Agroforestry species are correctly	Spermatophyta are identified			2

	classified basing on their botanical classification	Pteridophyta is identified			2
	1.3. Agroforestry species are correctly classified according to their morphological characteristics	Agroforestry species are classified by their size			2
		Agroforestry species are classified by their shape			2
		Agroforestry species are classified by their leaf group			2
		Agroforestry species are classified by their stem			2
		Agroforestry species are classified by their roots			2
		Agroforestry species are classified by their inflorescence			2
		Agroforestry species are classified by their crown			2
	1.4. Agroforestry species are properly localised according to their ecological factors	Forest species are localized by soil type			2
		Forest species are localized by climate			2
		Forest species are localized by topography			2
	1.5. Agroforestry species are properly classified according to their usage	Ornamental agroforestry species are identified			2
		Fodder agroforestry species are identified			2
		Timber agroforestry			2

		species are identified				
		Fruits agroforestry species are identified			2	
		Traditional agroforestry species are identified			2	
		Medicinal agroforestry species are identified			2	
2. Identify the categories of trees (30%)	3.1.	Trees are properly classified according to their phylogeny	Tree taxonomy is classified			6
	3.2.	Trees are properly grouped basing on their vascular system	Vascular trees are identified			6
			Non-vascular trees are identified			6
	3.3.	Trees are correctly classified according to their structures and properties	Structures of trees are identified			6
			Properties of trees are identified			6
	Total marks		100			
Percentage Weightage		100%				
Minimum Passing line % (Aggregate): 70%						

Reference books:

1. A.P. Dwivedi, (2006), Textbook of silviculture (p.307-3025)
2. Jonathan Cornelius, trent blare, jules Bayala, (2019), Biodiversity for food and agriculture
3. https://rngr.net/publications/ttsm/ch9.pdf/at_download/file
4. <https://www.coursehero.com/file/60196591/Topic-1-Introduction-to-Dendrologypdf>
5. www.globalbioenergy.org/uploads/media/Urban
6. <https://www.biblio.com/book/textbook-silviculture-dwivedi-p/d/928836696>
7. <https://www.the-agroforestry-handbook.pdf> (soilassociation.org)
8. [https%3A//www.academia.edu/66111152/USEFUL TREES AND SHRUBS FOR ETHIOPIA](https%3A//www.academia.edu/66111152/USEFUL_TREES_AND_SHRUBS_FOR_ETHIOPIA)
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