Republic of Rwanda
Ministry of Education

RTB | RWANDA TVET BOARD

TOPOGRAPHICAL DATA COLLECTION

AGRTD302

Collect topographical data

Competence

RQF Level: 3

Learning Hours 60

Credits: 6

Sector: Agriculture and Food processing

Trade: Agriculture

Module Type: Specific

Curriculum: AFPAGR3001 - TVET Certificate 3 in Agriculture

Issue Date: May 2022

Purpose statement	This module describes the skills, knowledge and attitude required to collect topographic data. It is designed for learners who have successfully completed 9 years' basic education or its equivalent and pursuing Level III in Agriculture. At the end of this module, learners will be able to prepare for topographic data collection operations, perform surveying and display survey results.					
Learning assumed to be in place	N.A					
Delivery modality	**Training delivery**		**100%**	**Assessment**		**Total 100%**
	Theoretical content		30%	Formative assessment	30%	100%
	Practical work:		70%		70%	
	• Group project and presentation	20%				
	• Individual project /Work	50%				

Elements of Competency and Performance Criteria

Elements of competency	Performance criteria
1. Prepare for topographic data collection operations	1.1. Instructions provided by supervisor are correctly interpreted
	1.2. Risks, occupational, health and safety (OHS) hazards are properly identified and assessed according to environment standards
	1.3. PPE are properly selected according to the desired operation
2. Perform surveying	2.1. Topographic data are properly identified according to the purpose
	2.2. Tools, materials, and equipment are adequately selected based on required topographic data
	2.3. Site is properly bordered according to the guidelines
	2.4. Tools and equipment are effectively positioned referring to the operation manual
	2.5. Topographical parameters are effectively measured according to the required data

	2.6. Tools and equipment are properly maintained according to the operator manual
	2.7. Data are appropriately recorded complying with the required format
3. Display survey results	3.1. Data are properly arranged according to the topographical measurements
	3.2. Topographical measurements are effectively calculated complying with required results
	3.3. Survey results are properly presented based on required topographic data
	3.4. Records are properly kept as required by supervisor

Learning outcomes	At the end of the module the learner will be able to: 1. Prepare for topographic data collection operations 2. Perform surveying 3. Display survey results

Learning outcome 1: Prepare for topographic data collection operations	Learning hours: 10
Indicative content	
• **Interpretation of instructions** ✓ Instructions on topographic data collection ✓ Site environment condition ✓ Site operation ✓ Maintenance of tools and equipment • **Assessment of occupational, health, safety (OHS) hazards and risks** ✓ Types of hazards associated with topographic data collection ✓ Type of risk • **Selection of PPE** ✓ Categories of PPE used in agriculture	
Resources required for the learning outcome	
Equipment	Projector and Computer
Materials	Field and Internet
Tools	Books, Manual descriptor, Notebooks, Agricultural workshop, Flipchart, Markers
Facilitation techniques	Demonstration and simulation, Individual and group work, Practical exercise, Individualized, Trainer guided and Group discussion
Formative assessment methods	Written assessment, Oral presentation, Performance assessment, Product based assessment and Project based assessment

Learning outcome 2: Perform surveying	Learning hours: 30
Indicative content	

- **Identification of topographic data**
- ✓ Definition of topography
- ✓ Topographic data
- ✓ Purpose of topographic data
- **Selection of tools, material, and equipment**
- ✓ Categories of tools and equipment
- Non optical tools, Optical equipment, Digital equipment
- **Delimitation of site**
- ✓ Landmarks
- ✓ Shape of site
- **Positioning of tools and equipment**
  - ✓ Adjustment
  - ✓ Optical equipment positioning
  - ✓ Digital equipment configuration
- **Measurement of topographical parameters**
- ✓ Non optical equipment
- Adjustment
- ✓ Optical equipment positioning
- Setting, Centering, Levelling, Focusing
- ✓ Digital equipment configuration
- Local projection parameters
- **Maintain tools and equipment**
- ✓ Maintenance techniques
- **Recording of data**

- ✓ Data to be recorded
- Altitude, Latitude, Longitude, Slope, Horizontal distance, Height difference, Horizontal angle, Vertical angle, Area.

Resources required for the indicative content	
Equipment	Computer, Projector, Theodolite, A-frame level, N-frame level, Carpenter level, Compass, Clinometer and GPS
Materials	Field, Marker, Pegs, Ranging poles, Dumpy level, Rope, tape measure and PPE
Tools	Books, Flip chart and Photos
Facilitation techniques	Demonstration and simulation, Individual and group work, Practical exercise, Individualized, Trainer guided and Group discussion
Formative assessment methods	Written assessment, Oral presentation, Performance assessment, Product based assessment and Project based assessment

Learning outcome 3: Display survey results	Learning hours: 20

Indicative content
• Arrangement of data ✓ Data entry methods ✓ Data filtering ✓ Levelling (Upper and lower reading) ✓ Distance using Stadia tachometry method (intermediate reading) ✓ Converting measures ✓ Per cent, Per mill, Grade, Degree, Minutes, Scale • **Calculation of topographical measurements** ✓ Topographic data computation ✓ Slope, Height difference, Horizontal difference, Area • **Presentation of survey results** ✓ Presentation of techniques: ✓ Non graphical (Tabular form) ✓ Graphical {Line graph (Levelling nets)} ✓ Purpose of data presentation ✓ Record the information ✓ Transmit the information • **Keeping of records** ✓ Data to be recorded ✓ Slope, Height difference, Horizontal difference,

Resources required for the indicative content	
Equipment	Computer, Projector, GPS
Materials	Field, Flipchart, Markers, Notebook, Calculator and PPE
Tools	Template, Internet, Related books and Forms of data collection
Facilitation techniques	Demonstration and simulation, Individual and group work, Practical exercise, Individualized, Trainer guided and Group discussion
Formative assessment methods	Written assessment, Oral presentation, Performance assessment, Product based assessment and Project based assessment

References:

1. Basic surveying, raymond epaul (author),walter whyte (author)
2. Bettess,f. 1992. surveying for archaeologists. university of durham department of archaeology.
3. Brinker,russell c. and minnick, roy.the surveying handbook. new york, new york van nostrandreinhold company.1987
4. Brower, c. and *al.,* 1985.*elements of topographic surveying,*rome, italy.
5. c.brouwerand a.goffeau ,j.plusjé, m.heibloem irrigation water management: training manual no. 2 - elements of topographic surveying
6. Electronic vs. conventional surveys, r.dixon (author)
7. Fundamentals of surveying: sample examination, georgem. colepepls(author)