

16.1.1

Introduction

This module unit involves the study of the processes of establishing points on part of the earth's surface in relation to other points of known altitude and bearing.

The module unit is intended to equip the trainee with knowledge, skills and attitudes necessary in computing heights of points and bearings which is necessary in construction works.

16.1.2

General Objectives

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

- a) understand working principles of survey instruments
- b) carry out survey work to provide data for planning, design & construction of works
- c) apply surveying skills to control construction works
- d) appreciate modern technologies in surveying field

16.1.3

Module Unit Summary and Time Allocation (55 Hours)

Code	Sub-Module Units	Content	Time Hours		Total
			Theory	pract	
16.1.01	Introduction to Surveying	<ul style="list-style-type: none"> • Definitions of Terms • objectives of surveying • Primary Classification • Types of Survey in Common Use 	1	-	1
16.1.02	Surveys in Common Use	<ul style="list-style-type: none"> • Types of Surveys • Tools and Equipment • Surveying Operations 	2	2	4

16.1.03	Levelling	<ul style="list-style-type: none"> • Definitions • Tools and Equipment • Setting Up, Reading and Booking • Reducing Levels • Plotting 	20	30	50
		Total	23	32	55

16.1.01 INTRODUCTION TO SURVEYING

Theory

- 16.1.01T0 *Specific Objectives*
By the end of the sub-module unit, the trainee should be able to:
- define terms in surveying
 - explain objectives of survey
 - classify survey
 - explain various types of surveys in common use

- 16.1.01C *Competence*
The trainee should have the ability to communicate effectively in surveying

Content

- 16.1.01T1 Terminologies
- surveying
 - level surface
 - leveling
 - horizontal line
 - horizontal surface

- vertical line
- datum surface
- reduced level
- line of collimation
- bench mark (BM)
- temporary bench mark (TBM)
- instrument station
- staff station
- back site (BS)
- fore sight (FS)
- intermediate sight (IS)

16.1.01T2

16.1.01T3

Objective of surveys
Classifications of surveys

- plane surveying
- geodetic surveying

16.1.01T4

Types of survey in common use

- topographical
- cadastral survey
- engineering surveys
- mining surveys
- aerial surveys

16.1.02 SURVEYS IN COMMON USE

Practice

Theory

16.1.02P0 *Specific Objectives*
By the end of the sub-module unit, the trainee should be able to:

- a) identify tools and equipments used for various surveying operations
- b) manipulate tools and equipments for various operations

16.1.02T0 *Specific Objectives*
By the end of the module unit, the trainee should be able to:

- a) explain various types of surveys in common use
- b) describe tools and equipment used in surveying operations
- c) outline the procedure of carrying out various surveys

Content

16.1.02P1 Tools and equipment
- marking tools
- measuring tools

16.1.02P2 Manipulation of tools and equipment
- retrieving from packages
- repacking
- accessories
- propping and setting

16.1.02C *Competence*
The trainee should have the ability to handle effectively tools and equipments for various surveys

Content

16.1.02T1 Types of surveys

- levelling
- traversing
- tacheometry
- curve ranging
- earthworks
- setting works
- aerial surveys

16.1.02T2 Tools and equipment in surveying operations

- marking tool and equipments
- measuring/fixing tools
- distances/heights
- angles

16.1.03 LEVELLING

Theory

16.1.03T0 *Specific Objectives*
By the end of the sub-module unit, the trainee should be able to:

- a) define terms used in levelling

- b) explain tools and equipment used in levelling
- c) outline the procedure of levelling
- d) outline methods of reducing levels
- e) identify electronic distance machines (EDMs) used in levelling

- 16.1.03T2 Tools and equipment used in levelling
- 16.1.03T3 Procedure of levelling
 - dumpy level
 - tilting level
 - automatic level
- 16.1.03T4 Methods of reducing levels
 - rise and fall
 - height of collimation
- 16.1.03T5 Identification of electronic distance machines (EDMs) used in levelling

16.1.03C *Competence*

The trainee should have the ability to:

- i) select tools for leveling
- ii) conduct leveling for an area
- iii) determine reduced levels for points
- iv) make drawings for leveled areas

Content

- 16.1.03T1 Terms used in levelling
 - Leveling
 - Level surface
 - Level line
 - Horizontal line
 - Vertical line
 - Datum surface
 - Reduced level
 - Line of collimation
 - Bench mark
 - Staff station
 - Back sight
 - Fore sight

Practice

16.1.03P0

Specific Objectives

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

- a) select tools and equipment for levelling
- b) set up levelling instruments
- c) read and book readings
- d) determining reduced levels of points
- e) draw plans and sections of leveled areas
- f) use electronic distance machines (EDM) for levelling

Content

- 16.1.03P1 Tools and equipment
- 16.1.03P2 Setting of level
- 16.1.03P3 Reading and booking
 - sighting target

- giving signs
 - reading/checking bookings
- 16.1.03P4 Reduced levels
- 16.1.03P5 Drawings
- contours
 - profiles
- 16.1.03P6 Use of EDMs

Suggested Teaching/Learning Methods

- Lecture
- Demonstration

Suggested Teaching/Learning Resources

- Leveling tools and equipment
- Charts and posters

- Filled in booking sheets (field notes)
- Plotted drawings

Suggested Assessment Methods

- Oral tests
- Written assignments
- Practical tests

Tools and Equipment

- Computer
- Measuring tools
- Marking tools
- Levels (dumpy, tilting, automatic)
- EDMs
- Leveling staffs
- Tacheometer
- Pegs
- Compass

easyvet.com