



Republic of Rwanda
Ministry of Education



RTB | RWANDA
TVET BOARD

ELTED301

DOMESTIC ELECTRICAL DRAWING

PERFORM DOMESTIC ELECTRICAL DRAWING

Competence

RQF Level: 3

Learning Hours



Credits: 7

Sector: Energy

Trade: Electrical Technology

Module Type: General

Curriculum: ENGELT3001- TVET Level 3 in Electrical Technology

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Purpose statement	This module describes the skills, knowledge and attitude required to perform domestic electrical drawing. It is intended for learners who have successfully completed the 9 years' basic education. At the end of this module, learners will be able to use Technical drawing instruments, materials and equipment, draw lines and symbols used in electrical drawing, perform drawing projections, draw electrical diagrams.				
Learning to assumed in place	SHE,				
Delivery modality	Training delivery	100%	Assessment	Total 100%	
	Theoretical content	30%	Formative assessment	30%	
	Practical work:	70%		70%	50%
	<ul style="list-style-type: none"> Group project and presentation 20% Individual project /Work 50% 				
				Summative Assessment	50%

Elements of Competency and Performance Criteria

Elements of competency	Performance criteria
1. Use Technical drawing instruments, materials and equipment	1.1. Drawing materials tools and equipment are appropriately selected according to their use
	1.2. The technical drawing materials, instruments and equipment are properly used according to their standard
	1.3. Materials, instruments and equipment are properly stored in accordance with their types
2. Draw lines and symbols used in electrical drawing	2.1. Types of line are correctly differentiated according to their uses and thickness
	2.2. Lines are correctly drawn according to their uses
	2.3. Drawing sheet layout are clearly presented in accordance with the drawing standards
	2.4. Techniques of free hand sketching are appropriately applied based on the given object
3. Perform drawing projections	3.1. Angles are correctly drawn based on international drawing standards
	3.2. Geometrical figures are correctly based on international drawing standards
	3.3. Objects are correctly drawn in 3D image
	3.4. Three principal views are correctly drawn in 3D image
	3.5. Objects are correctly drawn based on 2D representation requirements
	3.6. Dimensioning elements of electrical objects is correctly applied according to the electrical drawing standards.

	3.7. Drawing scales are properly used to reduce or enlarge electrical drawings
4. Draw electrical diagrams	4.1. Electrical symbols are correctly drawn based on their meaning.
	4.2. Types of electrical diagrams are properly selected based on their intended uses.
	4.3. One-line diagrams are correctly drawn according to the given installation.
	4.4. Schematic diagrams are correctly drawn according to the given installation.
	4.5. Wiring diagrams are correctly drawn according to given installation.
	4.6. Layout/installation/architectural plan diagrams are correctly drawn according to the given installation.
	4.7. A block diagram is correctly drawn according to the given installation.
	4.8. An as-built plan is correctly drawn using professional drawing software (CAD).
	4.9. Electrical diagrams and charts are effectively filled for future use in accordance with different formats.

Course content

Learning outcomes	At the end of the module the learner will be able to:
	<ol style="list-style-type: none"> 1. Select drawing materials and equipment according to their use 2. Use technical drawing materials, instruments and equipment when making graphics 3. Store drafting materials, instruments and equipment in accordance with their types
Learning outcome 1: Use Technical drawing instruments, materials and equipment	Learning hours: 10
Indicative content	
<ul style="list-style-type: none"> • Selection of drawing instruments and equipment <ul style="list-style-type: none"> ✓ Types of drawing equipment ✓ Types of drawing instruments ✓ Types of drawing materials • Utilization of technical drawing materials, instruments and equipment <ul style="list-style-type: none"> ✓ Technics to use drawing equipment ✓ Technics to use drawing tools ✓ Technics to use drawing materials • Storing of materials, instruments and equipment 	

Resources required for the learning outcome

Equipment	Computer
Materials	Paper, Templates
Tools	Pencils, Rulers, Erasers, compass, protractor , mini drafter, T-squares, Divider, Drawing board
Facilitation techniques / learning activities	<ul style="list-style-type: none"> Demonstration Individualized Trainer guided Group discussion Practical exercises
Formative assessment methods	<ul style="list-style-type: none"> Written assessment Oral presentation Performance assessment

Learning outcome 2: Draw line and symbols

Learning hours: 20

Indicative content

- Differentiation of types of line**
 - ✓ Sizes of lines
 - ✓ Name of line type
- Drawing lines according to their uses**
 - ✓ Application of lines
 - ✓ Dimension lines, leader
 - ✓ Long chain thin
 - ✓ Ruled line & short zigzag thin
- Presentation of drawing sheet layout**
 - ✓ Drawing sheet layout
 - ✓ Margin line
 - ✓ Title block
- Application techniques of free hand sketching**
- Printing of letters and figures following the standards.**
 - ✓ Types of letters
 - ✓ Dimension of Letters

✓ Application of lettering

Resources required for the indicative content

Equipment	Computer
Materials	Paper, Blank papers Templates
Tools	Pencils, Rules, Erasers. Blank papers , Compass, Protractor. Divider, Drawing board, Pencils, Rules, Erasers, Drawing board
Facilitation techniques & learning activities	<ul style="list-style-type: none">▪ Demonstration▪ Individual and group work▪ Trainer guided▪ Group discussion
Formative assessment methods	<ul style="list-style-type: none">▪ Oral presentation▪ Performance based assessment▪ Product based assessment

Learning outcome 3: Perform drawing projections

Learning hours: 15

Indicative content

- **Drawing of angles**
 - ✓ Types of angles
- **Drawing of geometrical figures**
 - ✓ Common polygons
 - ✓ Triangles
- **Drawing of an object**
 - ✓ Drawing of 3D images
- **Drawing of three principal views**
 - ✓ Principal views
- **Application of dimensioning techniques**
 - ✓ Use of element for dimensioning

<ul style="list-style-type: none"> • Use of drawing scales <ul style="list-style-type: none"> ✓ Use of scale (plain, diagonal) 	
Resources required for the indicative content	
Equipment	Computer
Materials	Drawing paper, Templates
Tools	Pencils, Rulers, Erasers, Blank papers, Compass, Protractor, Drawing board
Facilitation techniques & learning activities	<ul style="list-style-type: none"> • Demonstration and simulation • Practical exercise • Trainer guided • Group discussion
Formative assessment methods	<ul style="list-style-type: none"> • Written assessment • Oral presentation • Performance assessment • Product based assessment

Learning outcome 3: Draw electrical diagrams	Learning hours: 25
Indicative content	
<ul style="list-style-type: none"> • Drawing of electrical symbols <ul style="list-style-type: none"> ✓ General electrical symbols • Selection of types of electrical diagrams <ul style="list-style-type: none"> ✓ Wiring diagram ✓ Schematic Diagram • Drawing of one-line diagram <ul style="list-style-type: none"> ✓ Purpose ✓ Characteristics • Drawing of a schematic diagram <ul style="list-style-type: none"> ✓ Purpose of schematic diagram ✓ Characteristics • Drawing of a wiring diagram 	

- ✓ Purpose of wiring diagram
- ✓ Characteristics
- **Use of drawing scales**
 - ✓ Use of scale (plain, diagonal)
- **Drawing of a layout/installation/architectural plan diagram**
 - ✓ Characteristics
- **Drawing of a bloc diagram**
 - ✓ Purpose of bloc diagram
 - ✓ Characteristics
 - ✓ Parts of block Diagram
- **Drawing of an as-built plan**
 - ✓ Practice computerized drawing
- **Filing of electrical diagrams and charts**
 - ✓ Drawing sheets fording
 - ✓ Arrangement of document

Resources required for the indicative content

Equipment	Computer
Materials	Templates , Blank papers
Tools	Pencils, Rulers, Erasers, Compass, Protractor, Drawing board
Facilitation techniques and learning activities	<ul style="list-style-type: none"> • Jig saw • Demonstration and simulation • Practical exercise • Trainer guided • Group discussion
Formative assessment methods	<ul style="list-style-type: none"> • Written assessment • Oral presentation • Performance assessment • Product based evidence

References:

1. David Andelson(2006)Technical drawing
2. <http://www.mhhe.com/primis/online/>
3. SHRI P.J MEHATA(1988)3rdEdition,Engineering drawing practice,Newdelhi,INDIA
4. S. Chand &Er. R.K. Dhawan, Machine drawing
5. Warren J. Luzadder / Jon M. Duff, Introduction to Engineering drawing, second edition.
6. M Bhattacharyya & S. Pal, Fundamental of Engineering drawing, fourth Edition
7. K.R. GopalaKrishna,,Engineering drawing (vol I & II combined) edition 2001
8. Brian Hadley, Practical Engineering Drawing
9. Driscall, technical drawing for today, second edition
10. Dhawan, R. K., A Text Book of Machine Drawing in First Angle Projection, 2003.
11. Dhawan, R. K., A Text Book of Machine Drawing, 2nd ed., 1998.
12. Oweeye, E.M. and Smith, S.E., Engineering Drawing, 1994 edition.
13. Gopalakrishna, K. R., Engineering Drawing, 4th ed., 1991.
14. Bhattacharyya, M. & Pal, S., Fundamentals of Engineering Drawing, 1996 edition.
15. Warren, J. F. and Fon, M.D., Introduction to Interactive Computer Graphics for Design and Production, 2002 edition.
16. Parker, M., Manual of British Standards in Engineering Drawing and Design, 1997 edition.